



SIE-C815-13-16
DESCRIPTIVE
INFORMATION

PROGRAMMABLE CONTROLLER

Memocon-SC GL20/GL60S

USER'S MANUAL

POSITIONING MODULE

TYPE JAMSC-B2823

PULSE TRAIN INPUT

1. INTRODUCTION

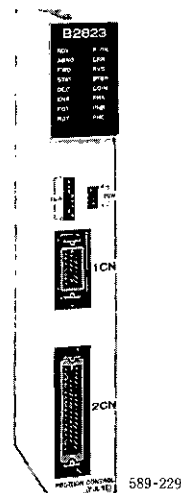
The Memocon-SC 2000 Series I/O Positioning Module JAMSC-B2823, or B2823 for short, is designed to comprise a positioning system in combination with the Programmable Controller Memocon-SC GL20 or GL60S, simply and conveniently.

This module has the following features:

- Simple point-to-point positioning function with linear accel/decel.
- Pulse train output speed references, having $\overline{CCW} + \overline{CW}$, and sign + pulse output method.
- Simple on-line setting of travel distance, speed, and accel/decel time from GL20 or GL60S, for each positioning motion.
- Bias speed can be set at starting.
- Can select whether feedback pulse signal should be connected.

This manual describes the composition of a positioning system using the B2823. Following are additional reference manual.

- Memocon-SC GL20 User's Manual Design and Maintenance (SIE-C815-13.1)
- Memocon-SC GL60S User's Manual-No.1 Design and Maintenance (SIE-C815-14.1)
- Memocon-SC GL60S User's Manual-No.2 Basic Information (SIE-C815-14.2)
- Memocon-SC GL60S User's Manual-No.3 SFC Information (SIE-C815-14.3)



Positioning Module
Type JAMSC-B2823

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2. CONFIGURATION

Fig. 2.1 shows a system configuration for positioning module, Type JAMSC-B2823.

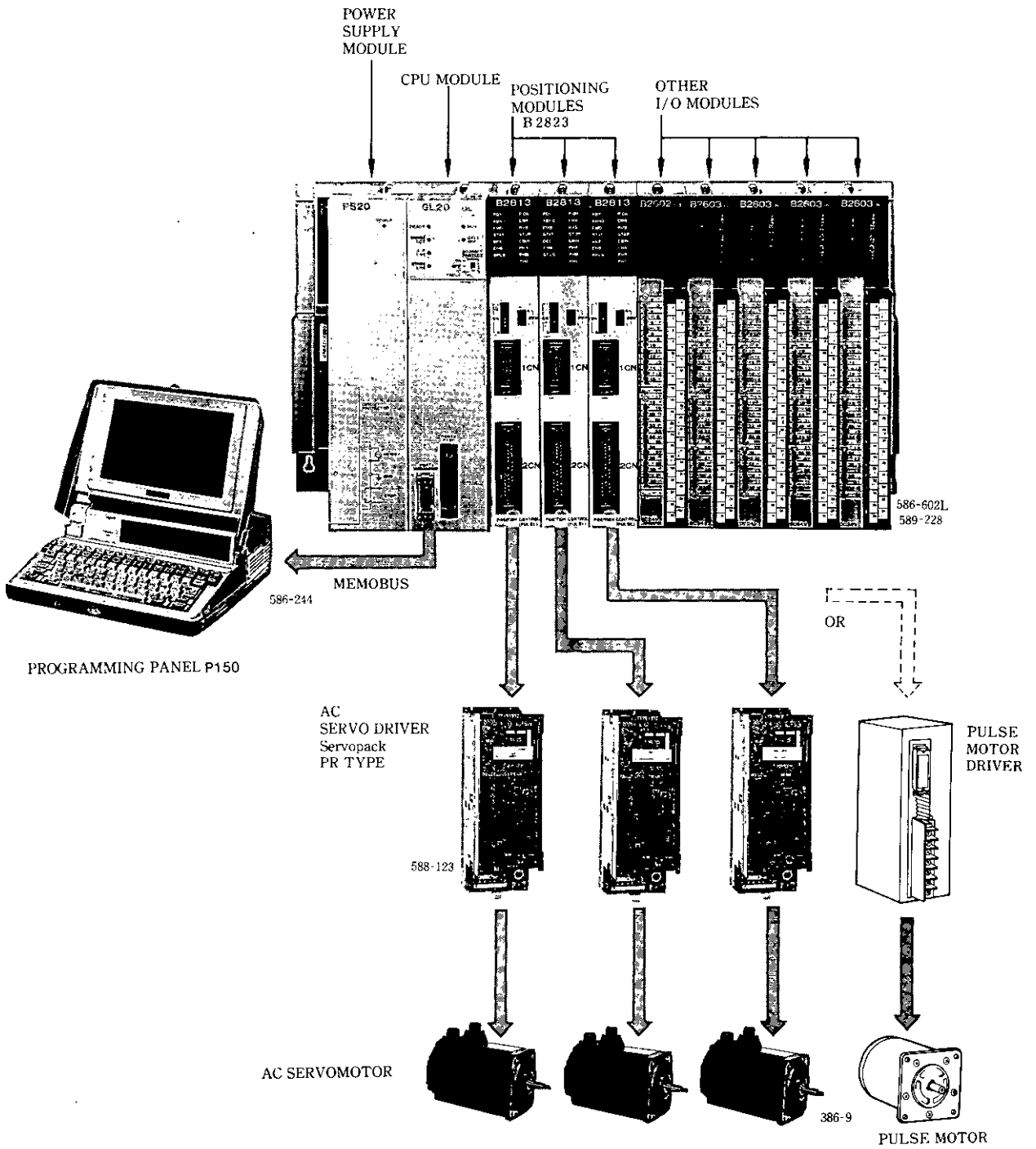


Fig. 2.1 B2823 System Configuration

3. SPECIFICATIONS

This section describes B2823 general specifications, performance and interface for external device connection.

3.1 GENERAL SPECIFICATIONS

Table 3.1 General Specifications

Items	Specifications
Type	JAMSC-B2823
Ambient Temperature	0 to +55°C
Storage Temperature	-10 to +75°C
Humidity	10% to 90% RH (non-condensing)
Vibration Resistance	In compliance with JIS* C0911. (Range : 10 to 55 Hz, amplitude : 0.075 mm, No. of liftings : 10 times)
Shock Resistance	10G max in compliance with JIS* C0912.
Environmental Condition	Free from explosive, inflammable and corrosive gases.
Dimensions in mm (inch)	37 (1.46) W × 250 (9.84) H × 79 (3.11) D ; 1 span
Internal Consumed Current (Vcc)	0.25A 5VDC±3%
Approx Weight	0.6 kg (1.3 lb)

* Japanese Industrial Standard

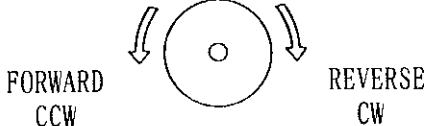
3.2 PERFORMANCE

Table 3.2 Performance

Items	Specifications	Remarks	
Function	Point-to-point automatic positioning	With liner accel/decel speed	
Number of Control Axis	1 Axis	--	
Applicable Mainframe	GL20, GL60S	Selectable by switch	
Number of I/O Allocation Points and Registers	<ul style="list-style-type: none"> • Input relay : 16 points • Output coil : 24 points (16 points available) • Input register : 6sets (4 regis- ters available) • Output register : 	Number of I/O allocation in CPU module Binary allocation	
Positioning Function	Motion Distance	-999,999 to +999,999 (GL20) -99,999,999 to +99,999,999 (GL60S)	
	Reference Speed	(1 to 9,999) × 10 pps (in 10 pps) (1 to 9,999) × 20 pps (in 20 pps)	Selectable by switch (10 pps/20 pps)
	Bias Speed	(0 to 999) × 10 pps (in 10 pps) (0 to 999) × 20 pps (in 20 pps)	Selectable by switch (10 pps/20 pps)
	Reference Accel/Decel Speed Time	(1 to 99) × 10 ms (in 10 ms) (1 to 99) × 0.1 s (in 0.1 s)	Selectable by initial setting (10 ms/0.1 s)
Positioning Mode	Absolute mode, incremental mode	Selectable by initial setting	
Setting Data	Data for next one position	During operation, next setting possible.	
Zero Return	Provided (2 modes)	Selectable by initial setting	

3.2 PERFORMANCE (Cont'd)

Table 3.2 Performance (Cont'd)

Items	Specifications	Remarks	
JOG Function	High speed, low speed	—	
Special Positioning	Provided	—	
Counter Specifications	Pulse System	A-/B-phase	—
	Pulse Input Voltage	+12 V +5 V (line receiver)	Selectable by switch
	Multiplier	×1, ×2, ×4	Selectable by switch
	Max. Counting Speed	200 kpps (×1), 400 kpps (×2), 800 kpps (×4)	—
	Feedback Pulse Selection	When using matching detection mode, connect the counter module, Servopack and the motor to set feedback pulse circuit, then select 0. However, when not selecting that mode, select 1. In that case, the counter module, Servopack and the motor need not be connected.	Refer to Initial Setting (5.4.1).
External Pulse Input (Manual Operation)	Pulse input voltage : +12 V, +5V Max. counting speed : 100 kpps Pulse system : A-/B-phase Multiplier : ×1	Selectable by switch	
Speed Reference Output	Pulse train output Sign + pulse : +12 V CCW + CW : Open collector output Max speed : 100 kpps/200 kpps Pulse output duty : 50%	Selectable by switch	
External Input Signal	<u>EXT. PULSE INPUT ENABLE,</u> <u>EXT. START, EXT. STOP,</u> <u>SERVO NORMAL, DECEL LS,</u> <u>FWD OVER LS, RVS OVER LS</u>	For +12 V/+24 V	
External Output Signal	CLR, COIN, fault	+12 V output	
External Power Supply	+12 VDC ±5%, 0.3 A +5 VDC ±5%, 0.8 A	—	
Indicator Lamp	16 lamps	—	
Switch	4-/8-point switches	—	
Self Diagnosis	ROM/RAM check Watchdog timer check	—	
Motor Rotation Method		Rotating direction indicator in this manual shows rotating direction of shaft, viewed from motor drive end.	

3.3 INTERFACE OF CPU MODULE AND EXTERNAL DEVICES

Fig. 3.1 shows the relationship between B2823 interfaces, CPU module (GL20, GL60S) and external devices.

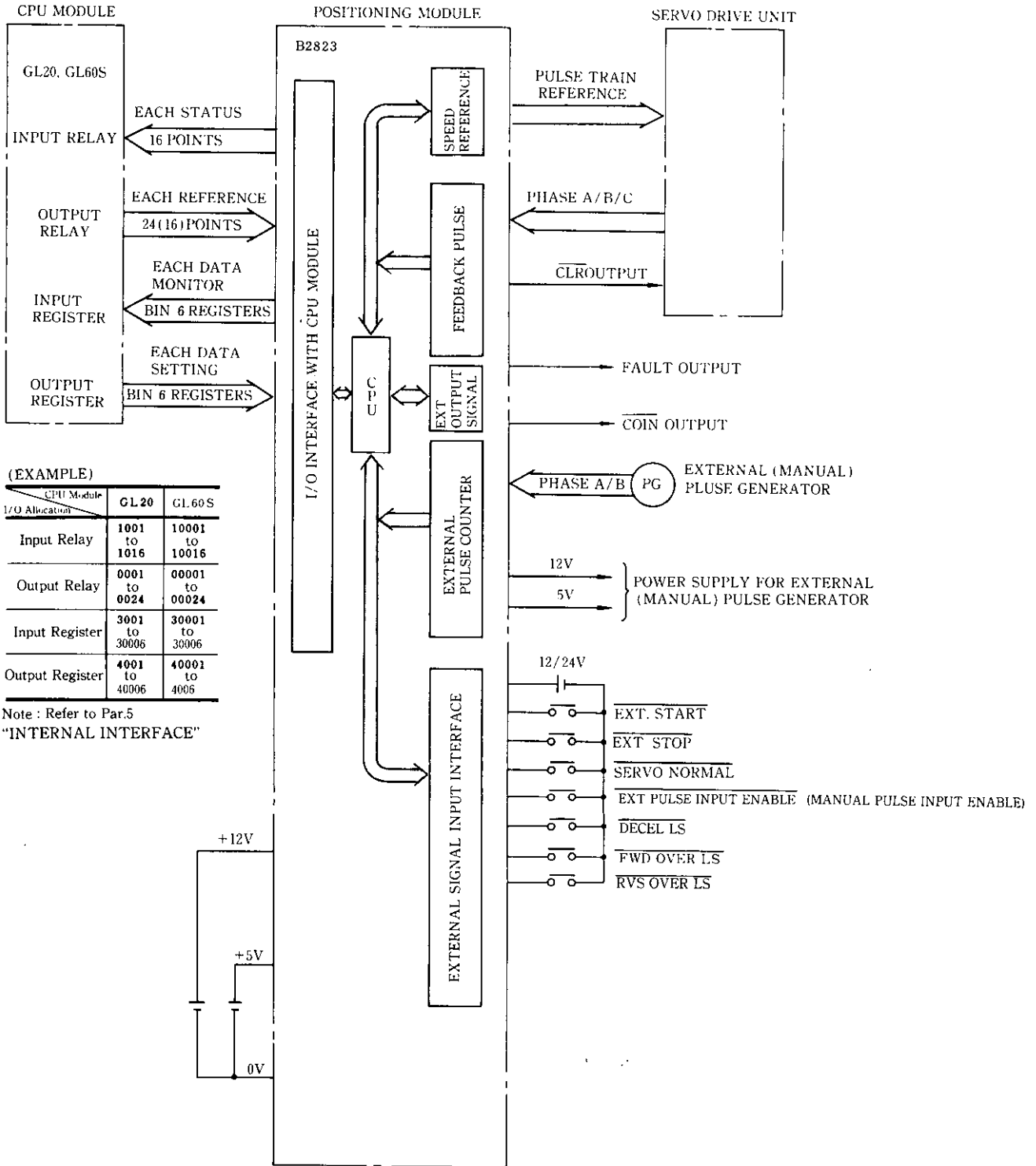


Fig 3.1 Interface of CPU Module and External Devices

3.4 B2823 OPERATION FLOW

Fig. 3.2 shows B2823 operation outline.
 (The reference numbers here are given as an example.)

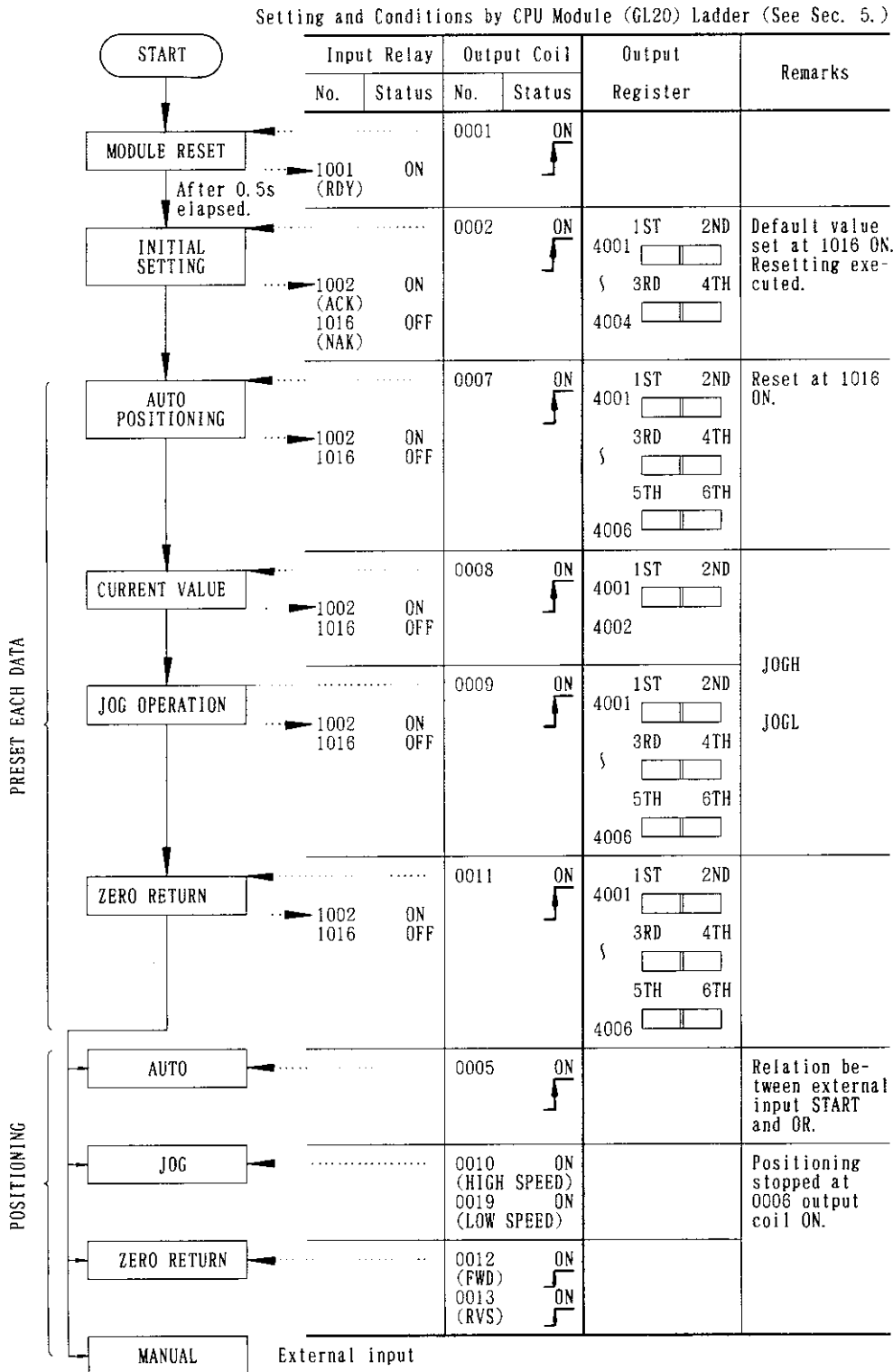


Fig 3.2 B2823 Operation FLOW

4. FUNCTIONS

Positioning module functions are explained in the following paragraphs.

4.1 INCREMENTAL/ABSOLUTE MODE

Incremental mode or absolute mode can be selected on an initial setting stage.

4.1.1 Incremental Mode

(1) Position Command Setting

Motion distance is set as a position command.

<p>CURRENT POSITION MINUS AREA (RVS) 0 PLUS AREA (FWD)</p>	<p>For moving from current position P_0 to P_1, sign is set for forward, and motion distance $P_1 - P_0$ is set as position command.</p>
	<p>For moving from current position P_1 to P_3, sign is set for forward, and motion distance $P_3 - P_1$ is set as position command.</p>
	<p>For moving from current position P_3 to P_2, sign is set for reverse, and motion distance $P_3 - P_2$ is set as position command.</p>

(2) Current Value Counting Operation

Fig. 4.1 shows a basic operation of current value counter.

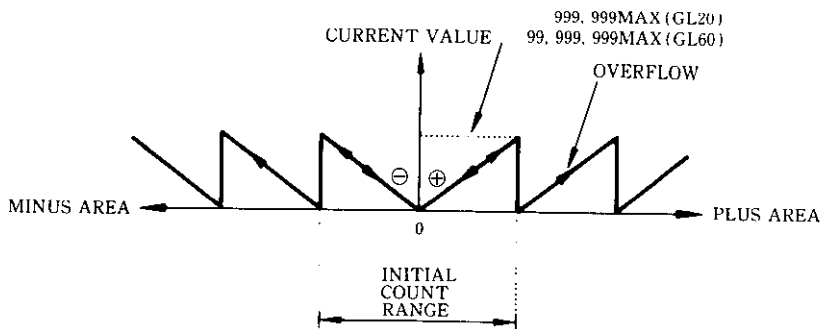
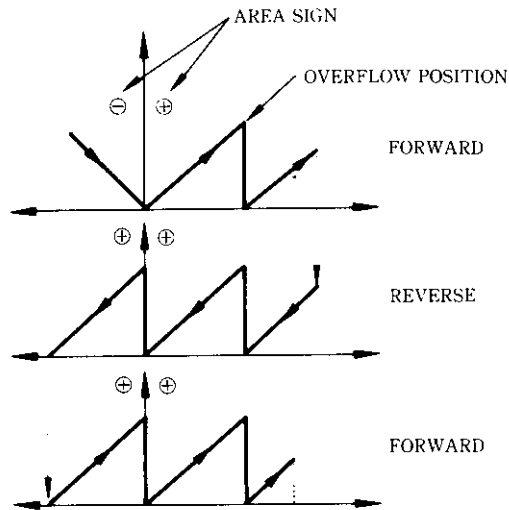


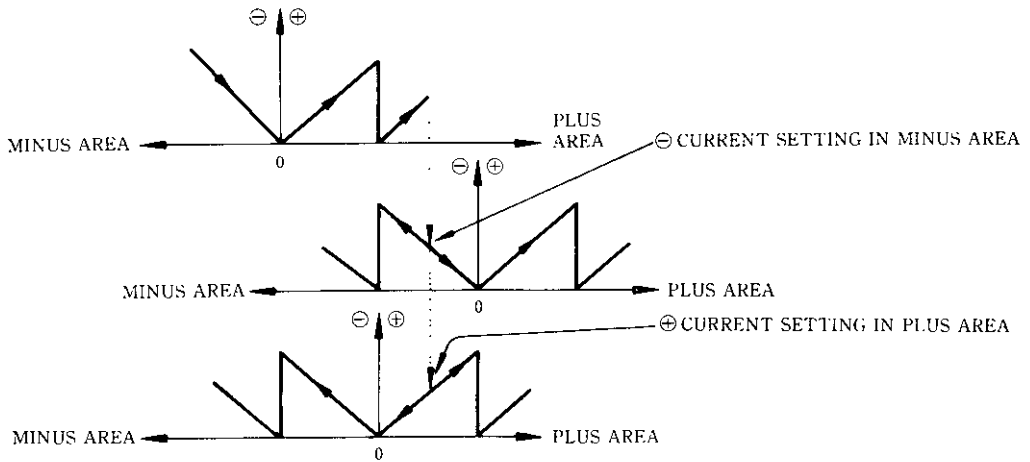
Fig. 4.1 Current Value Counter Operation

4.1.1 Incremental Mode (Cont'd)

(a) When the current value counter has exceeded the initial count range, an area sign is fixed.



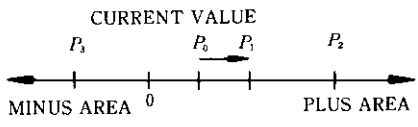
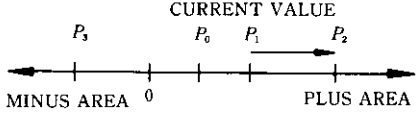
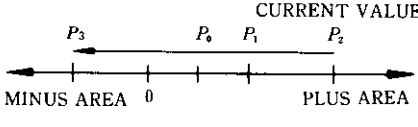
(b) The current value counter is activated in the initial count range when a current value resetting, a current value 0 setting, or a zero return is executed.



4.1.2 Absolute Mode

(1) Position Command Setting

Absolute position is set as the position command.

 <p>CURRENT VALUE P_0 P_1 P_2 MINUS AREA 0 PLUS AREA</p>	<p>For moving from current position P_0 to P_1, sign is set in plus area and absolute position P_1 is set as position command.</p>
 <p>CURRENT VALUE P_0 P_1 P_2 MINUS AREA 0 PLUS AREA</p>	<p>For moving from current position P_1 to P_2, sign is set in plus area and absolute position P_2 is set as position command.</p>
 <p>CURRENT VALUE P_0 P_1 P_2 MINUS AREA 0 PLUS AREA</p>	<p>For moving from current position P_2 to P_3, sign is set in plus area and absolute position P_3 is set as position command.</p>

(2) Current Value Counting Operation

Fig. 4.2 shows a basic operation of the current value counter.

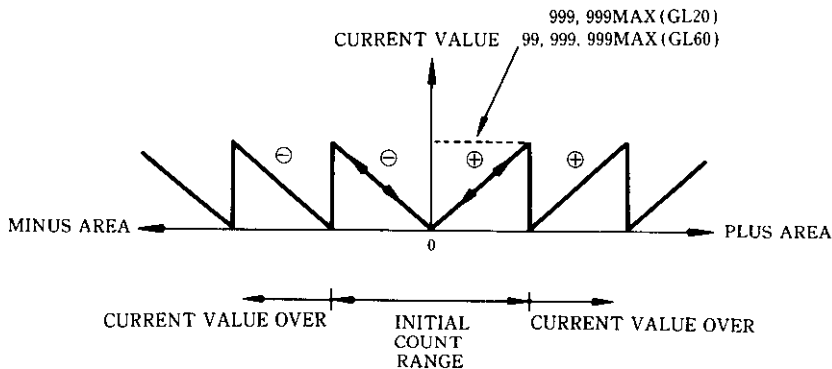
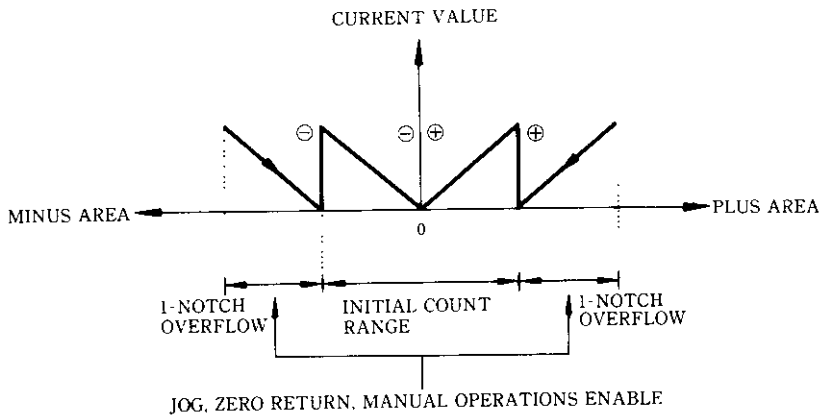


Fig. 4.2 Current Value Counter Operation

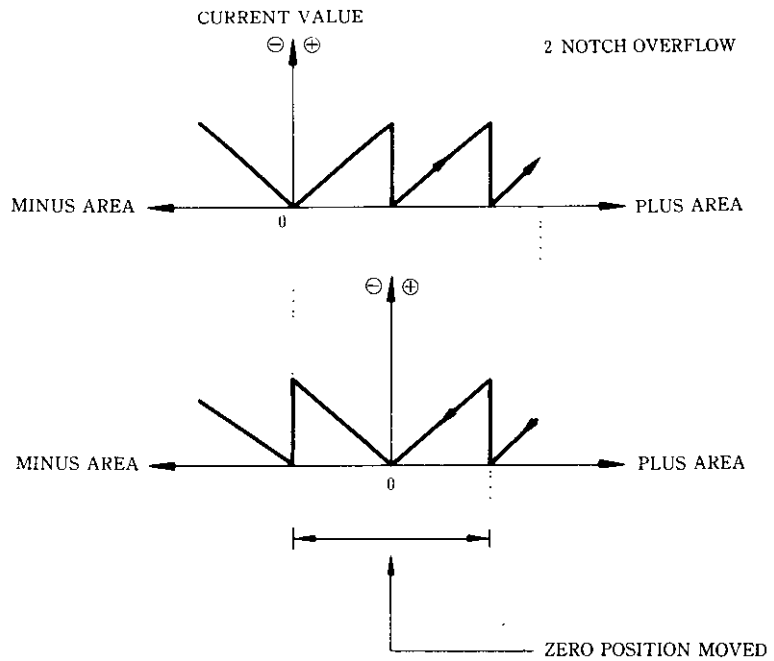
- (a) If the current value counter has exceeded the initial count range (initial absolute position range) 0 to $\pm 999,999$ (0 to $\pm 99,999,999$), "CURRENT VALUE OVER" input relay is turned on (error code 24 is issued). At this time, automatic operation is prohibited.

JOG, zero return and manual operations remain operational. On return to the initial count range, CURRENT VALUE OVER is released. CURRENT VALUE OVER cannot be released by current value setting. Even while CURRENT VALUE OVER is ON, the current value counter continues counting.

4.1.2 Absolute Mode (Cont'd)



- (b) If the current value counter exceeds more than 2-notch overflow, the normal range cannot be restored even on returning to the initial count range by JOG, zero return, or manual operation. In this case, the zero position moves.



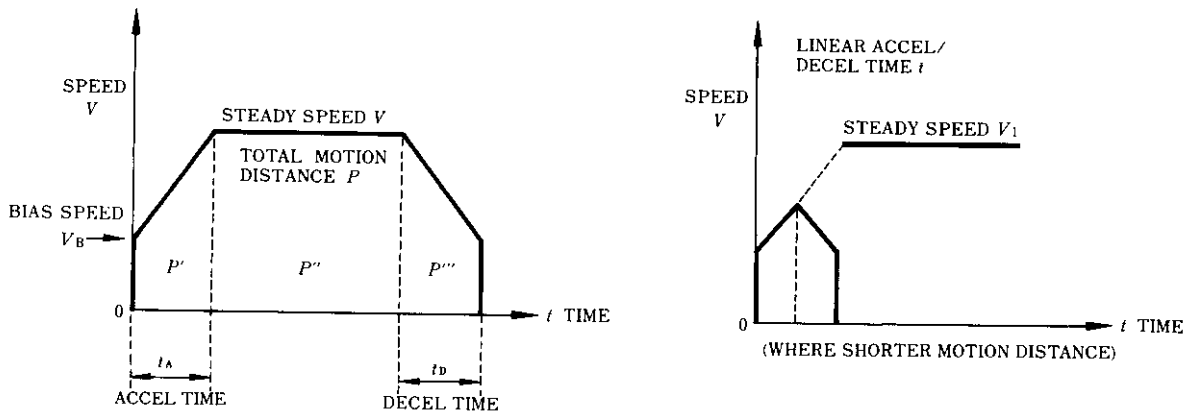
4.2 AUTOMATIC POSITIONING

4.2.1 1-Step Speed Basic Function

Automatic positioning has two motion modes : 1-step and 2-step speeds. Select one of them (Initial setting).

(1) Basic Pattern

$$\left\{ \begin{array}{l} \text{Total Motion Distance } P (= \text{Area}) = P' + P'' + P''' \\ \text{Linear Accel/Decel Time} = \text{Linear Accel Time } t_A = \text{Linear Decel Time } t_D \end{array} \right.$$



(2) Setting Items and Range Required for 1-step Speed Motion

Table 4.1 Setting Item and Range

No.	Item	Range	Remarks
1	Incremental mode : motion distance P	0 ~ $\pm 999,999$ pulses (GL20) 0 ~ $\pm 99,999,999$ pulses (GL60S)	Switch selection : GL20 (6digits)/ GL60S (8digits)
	Absolute mode : absolute position P		
2	Steady speed V	(1~9,999) $\times 10$ pps (1~9,999) $\times 20$ pps	Switch selection : $\times 10$ pps/ $\times 20$ pps
3	Bias speed V_B	(0~999) $\times 10$ pps (0~999) $\times 20$ pps	
4	Linear accel time t_A	(1~99) $\times 10$ ms (1~99) $\times 0.1$ s	Initial setting selection $\times 10$ ms/ $\times 0.1$ s

Note:

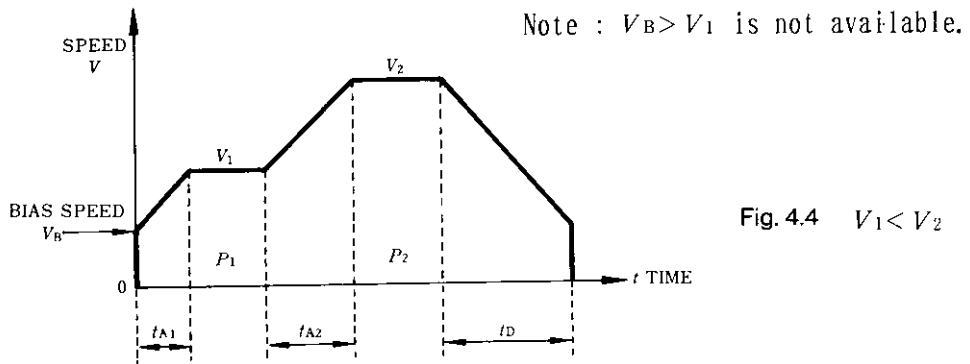
- Speed setting $V_B > V_1$ causes an error (error code : 20).
- When $V_B = V_1$, automatically t_A is regarded as 0 and setting of $t_A = 0$ is disregarded.

4.2.2 2-Step Speed Basic Function

(1) Basic Pattern

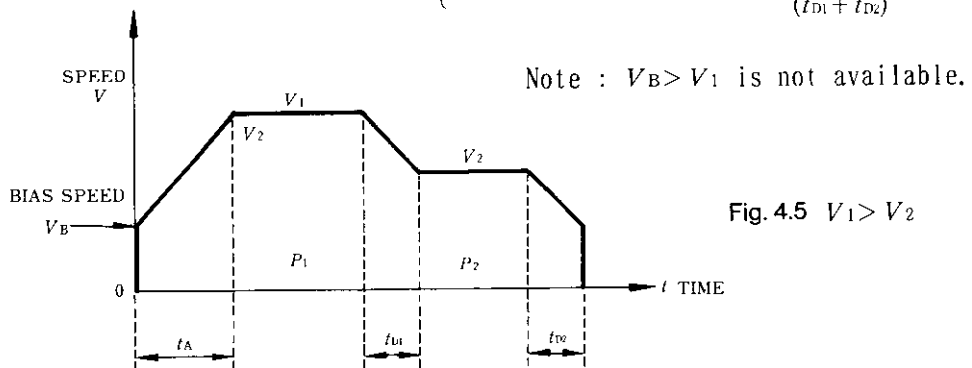
① Steady Speed $V_1 < V_2$

$$\left\{ \begin{array}{l} \text{Total Motion Distance } P = P_1 + P_2 \\ \text{Linear Accel Time } (t_{A1} + t_{A2}) = \text{Linear Decel Time } t_D \end{array} \right\}$$



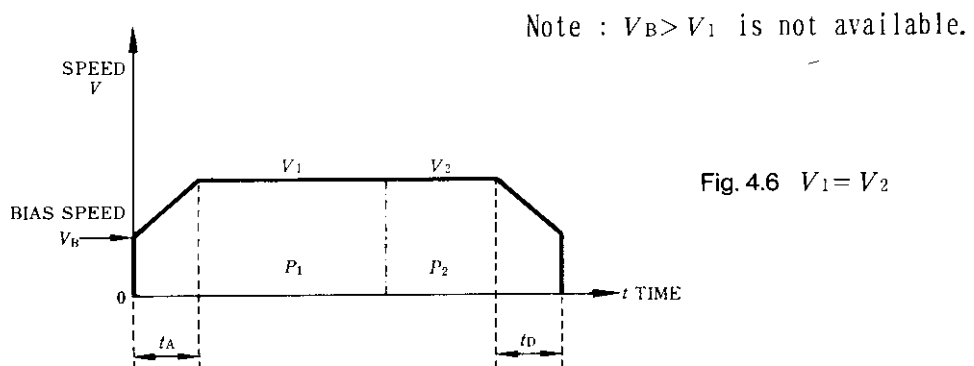
② Steady Speed $V_1 > V_2$

$$\left\{ \begin{array}{l} \text{Total Motion Distance } P = P_1 + P_2 \\ \text{Linear Accel Time } t_A = \text{Linear Decel Time } (t_{D1} + t_{D2}) \end{array} \right\}$$



③ Steady Speed $V_1 = V_2$

$$\left\{ \begin{array}{l} \text{Total Motion Distance (Area) } P = P_1 + P_2 \\ \text{Linear Accel Time } t_A = \text{Linear Decel Time } t_D \end{array} \right\}$$



(2) Setting Items and Range Required for 2-Step Speed Motion

Table 4.2 Setting Item and Range

No.	Item	Range	Remarks
1	Incremental mode : motion distance P_1, P_2	0~±999,999pulses(GL20) 0~±99,999,999pulses(GL60S)	Switch selection : GL20 (6digits)/ GL60S (8digits)
	Absolute mode : absolute position P_1, P_2		
2	Steady speed V_1, V_2	(1~9,999)×10pps (1~9,999)×20pps	Switch selection : ×10pps/×20pps
3	Bias speed	(0~999)×10pps (0~999)×20pps	
4	Linear accel time t_A	(1~99)×10ms (1~99)×0.1s	Initial setting selection×10ms/×0.1s

Note:

1. Speed setting $V_B > V_1, V_2$ causes an error (error code : 20).
2. In Fig. 4.7, t_A is set with linear accel time ($t_A = t_D$)
3. When $V_B = V_1$, automatically t_A is regarded as 0 and setting of $t_A \neq 0$ is disregarded.

(3) Other Patterns

① $V_1 < V_2$ and $V_1 = V_B$

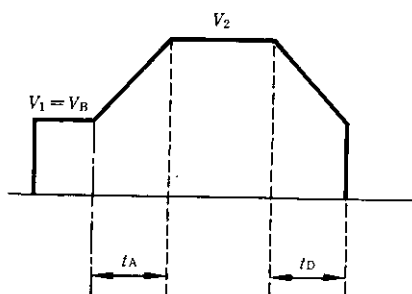


Fig. 4.7

② $V_1 > V_2$ and $V_2 = V_B$

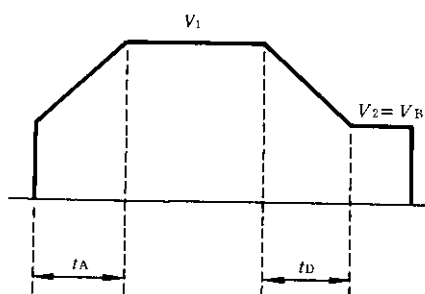


Fig. 4.8

③ $V_1 = V_2 = V_B$

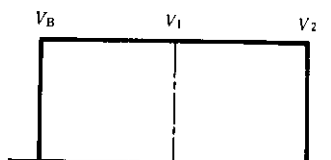


Fig. 4.9

4.2.2 Automatic Positioning Operation Patterns (Cont'd)

- ④ When linear accel time t_A , speed V_1, V_2, V_B require a bigger motion than motion amounts P_1 and/or P_2 , 2-step speed motion is not available and 1-step speed motion is provided instead.

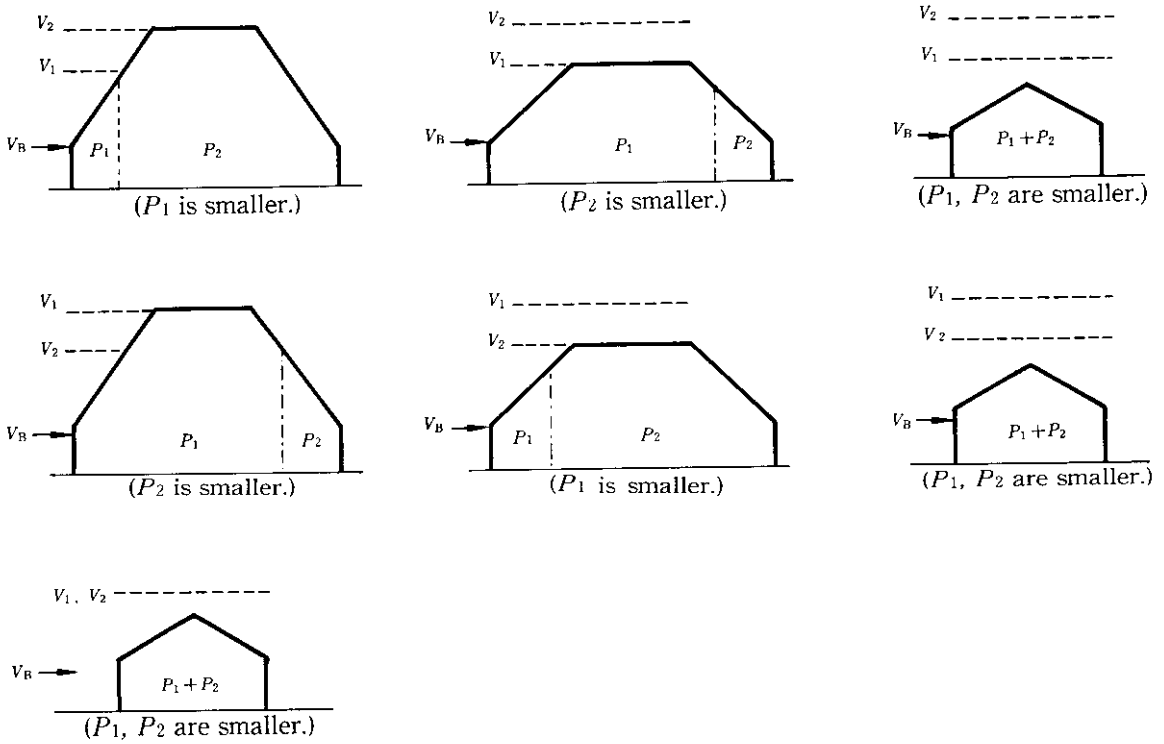


Fig. 4.10

4.2.3 Automatic Positioning Operation Patterns

Descriptions of automatic positioning operation patterns are listed in Table 4.3.

Table 4.3 Operation Patterns

Drawing No.	Contents of Operation Pattern	Drawing No.	Contents of Operation Pattern
Fig. 4.11	1-step speed pattern in incremental mode	Fig. 4.20	2-step speed pattern in incremental mode
	Basic pattern		Basic pattern
Fig. 4.12	Omission of positioning setting	Fig. 4.21	Omission of positioning setting
Fig. 4.13	Start command during motion	Fig. 4.22	Positioning setting and start command during motion
Fig. 4.14	Positioning setting during motion	Fig. 4.23	Temporary pausing in incremental mode
Fig. 4.15	Temporary pausing in incremental mode	Fig. 4.24	2-step speed pattern in absolute mode
Fig. 4.16	1-step speed pattern in absolute mode		Basic pattern
	Basic pattern	Fig. 4.25	Positioning setting during motion
Fig. 4.17	Positioning setting and start command during motion	Fig. 4.26	Temporary pausing in absolute mode
Fig. 4.18	Temporary pausing in absolute mode		
Fig. 4.19	Positioning setting after temporary pausing		

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

(1) 1-Step Speed Pattern in Incremental Mode

(a) Basic pattern

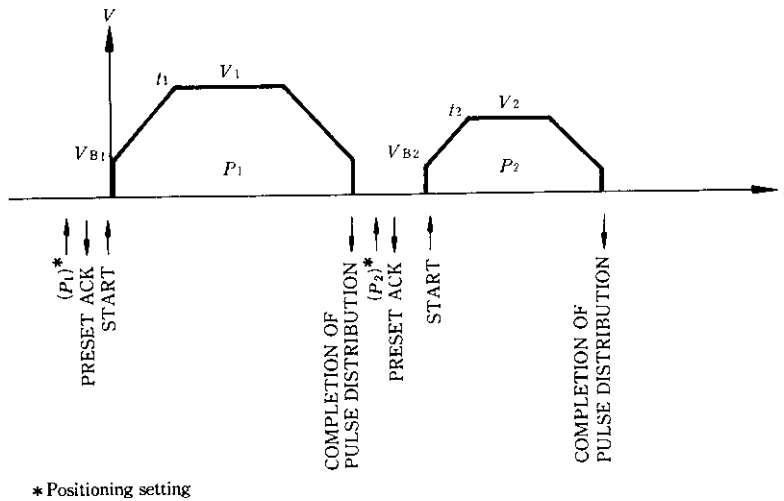


Fig. 4.11 Basic Pattern

(b) When the same operation is repeated, positioning setting is not required every time.

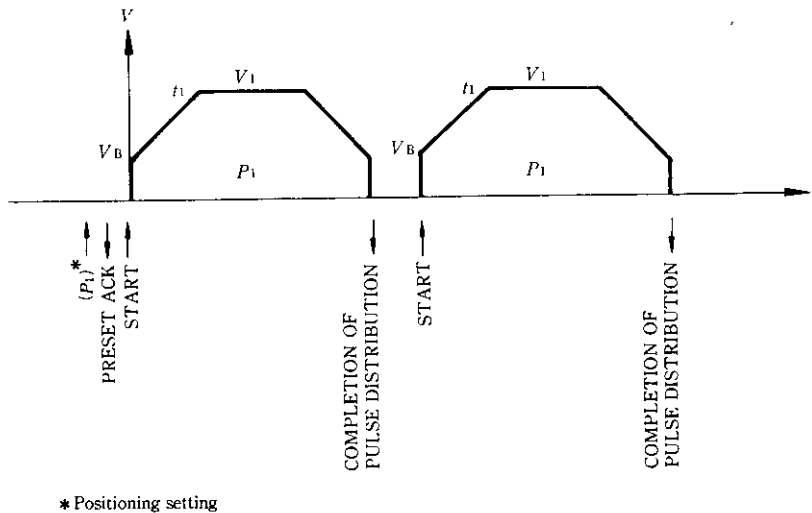


Fig. 4.12 Omission of Positioning Setting

(c) During motion, start of the next positioning can be commanded. In this case, the next positioning will start immediately after completion of the current positioning pulse distribution (COIN).

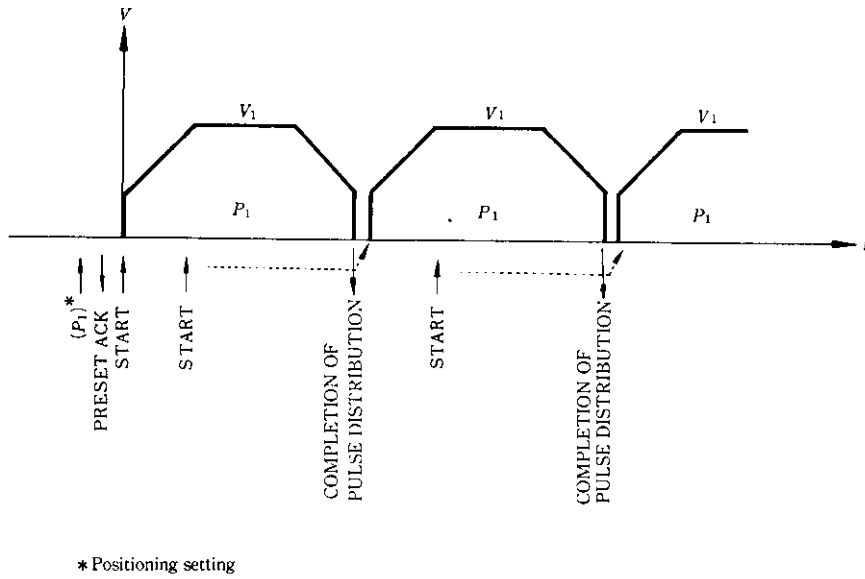


Fig. 4.13 Start Command during Operation

(d) During motion, the next positioning can be set.

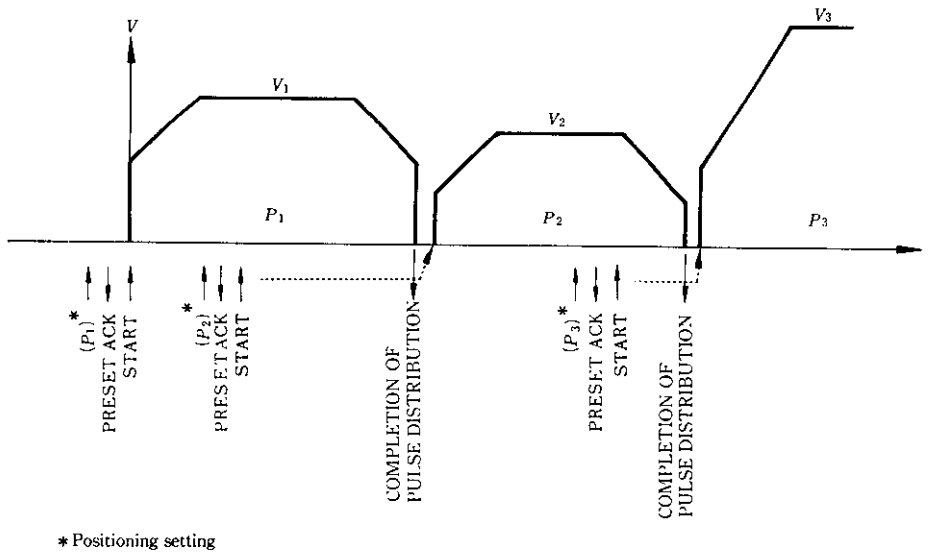


Fig. 4.14 Positioning Setting during Motion

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

(e) Temporary pausing in incremental mode

When temporary pausing is effected in incremental mode, the remaining motion distance $|P_1 - P'_1|$ is canceled. If trying restart without setting P_2 position, movement recurs by P_1 . Start command of the next positioning (start reservation) is canceled by STOP. In case P_2 positioning is set during P_1 motion, the setting (preset reservation) is not canceled even by STOP.

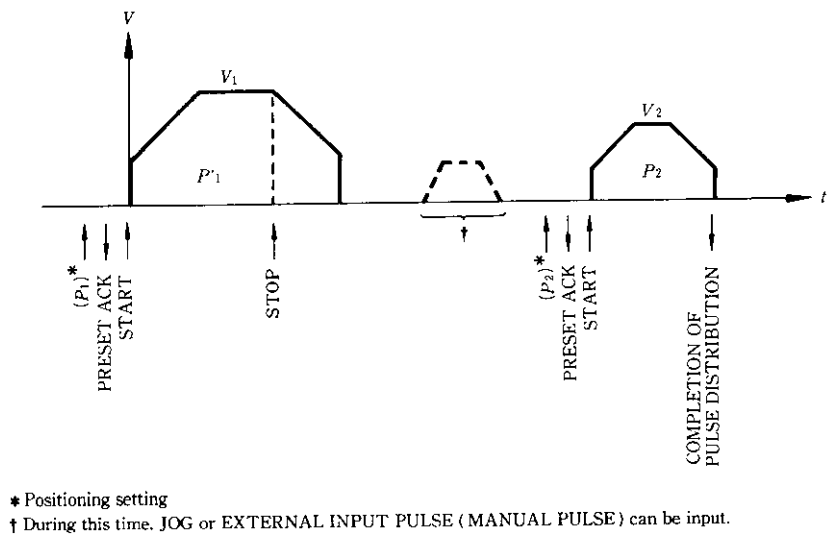


Fig. 4.15 Temporary Pausing in Incremental Mode

(2) 1-Step Speed Pattern in Absolute Mode

(a) Basic pattern

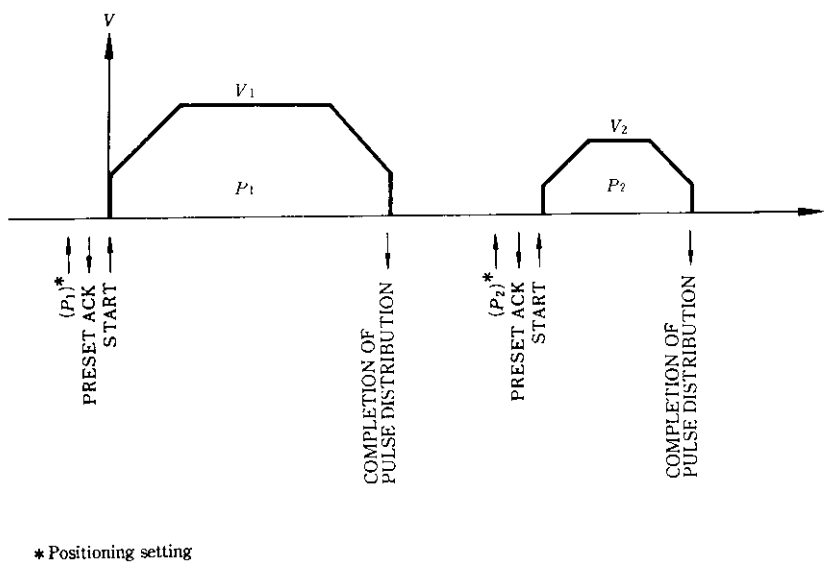
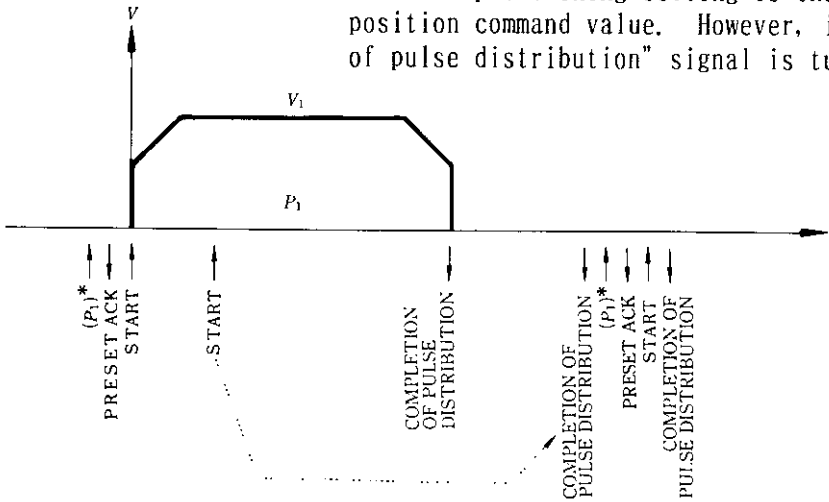


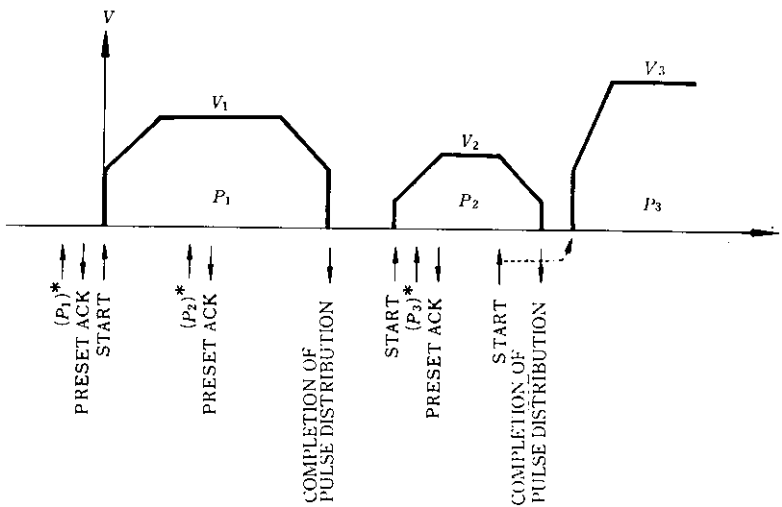
Fig. 4.16 Basic Pattern in Absolute Mode

Only the pulse command is not output when only the start command is issued without setting the next positioning. This also takes place if the position command value in the next positioning setting is the same as the previous position command value. However, input relay "completion of pulse distribution" signal is turned ON.



* Positioning setting

(b) During motion, the next positioning operation can be set and its start can be commanded.



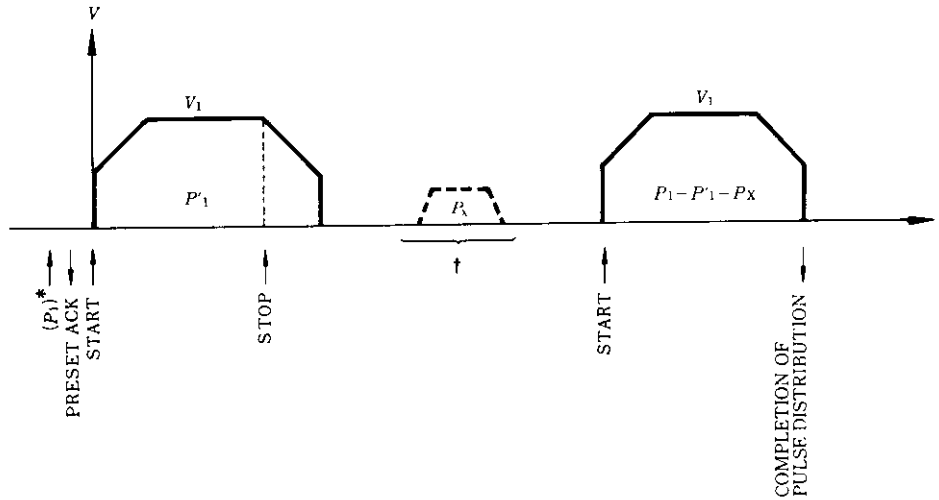
* Positioning setting

Fig. 4.17 Positioning Setting and its Start Command during Motion

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

(c) Temporary pausing in absolute mode and start command after pausing

After temporary pausing, the machine moves over the remaining distance unless setting for the next positioning is made.

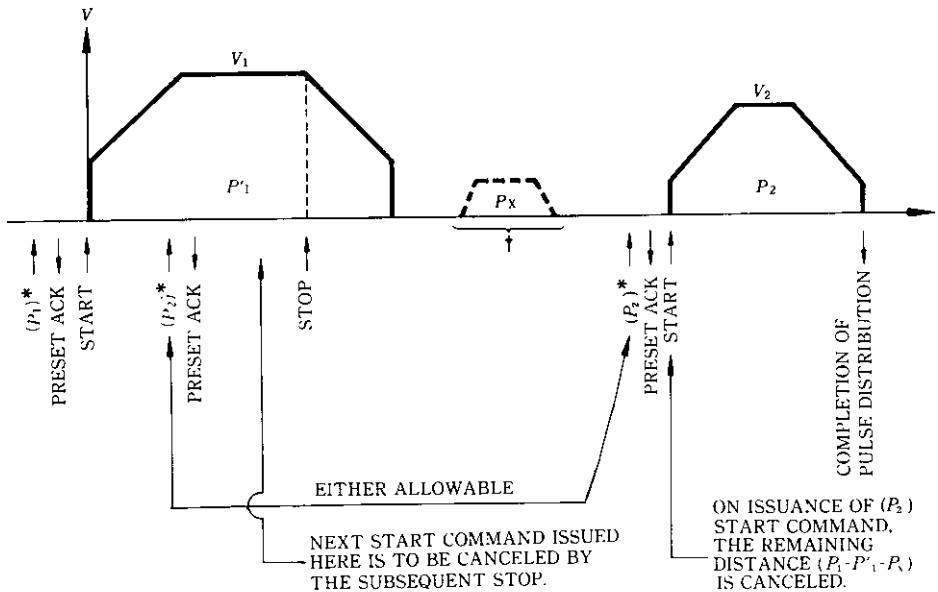


* Positioning setting

† During this time, JOG or EXTERNAL INPUT PULSE (MANUAL PULSE) can be input.

Fig. 4.18 Temporary Pausing in Absolute Mode

If the next positioning is set, positioning action starts toward the commanded position.



* Positioning setting

† During this time, JOG or EXTERNAL INPUT PULSE (MANUAL PULSE) can be input.

Fig. 4.19 Positioning Setting after Temporary Pausing

(d) Action for JOG operation or handle operation (external command pulse input) after temporary pausing in absolute mode

- In case of start command without positioning setting after temporary pausing (Fig. 4.18)

	<p>Motion stops at absolute position P_1 according to STOP ON while positioning toward P_1 position.</p>
	<p>Movement is effected from P_1 to P_x by JOG operation or handle operation (external command pulse input).</p>
	<p>Movement toward P_1 occurs up on issuing the start command of positioning again.</p>

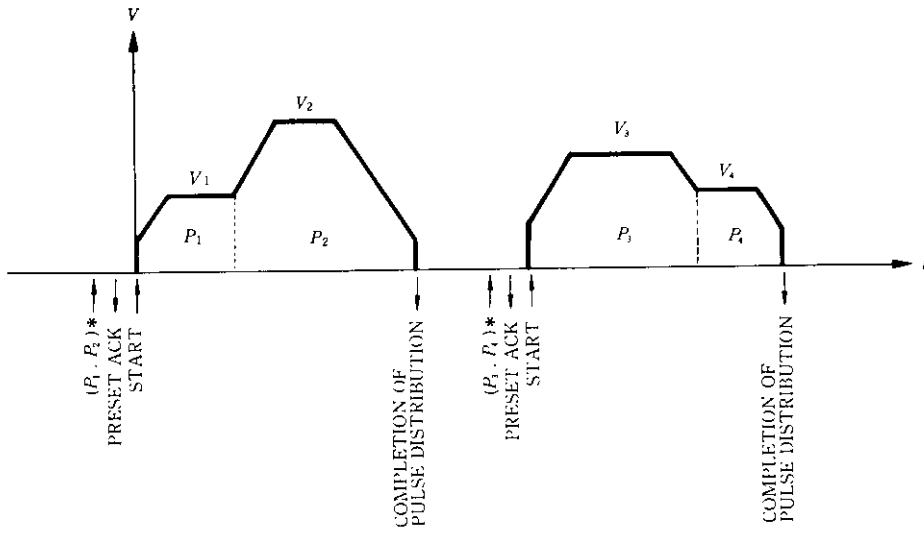
- In case of start command with positioning setting after temporary pausing (Fig. 4.19)

	<p>Motion stops at absolute position P_1 according to STOP ON while positioning toward P_1 position.</p>
	<p>Movement is effected from P_1 to P_x by jog operation or handle operation (external pulse input).</p>
	<p>Operation starts toward P_2 on distribution of start command with absolute position P_2 set.</p>

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

(3) 2-Step Speed Pattern in Incremental Mode

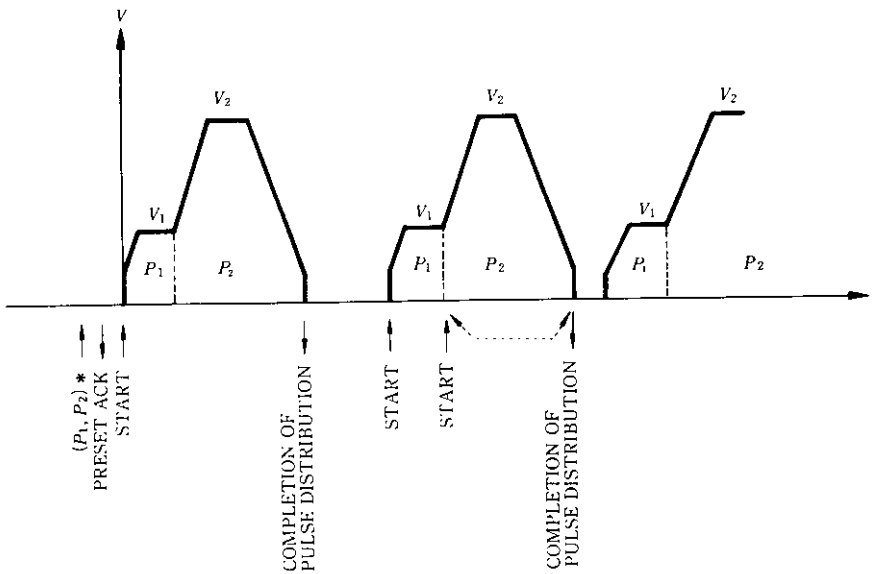
(a) Basic pattern



* Positioning setting

Fig. 4.20 Basic Pattern

(b) Skipping the positioning setting



* Positioning setting

Fig. 4.21 Skipping the Positioning Setting

(c) Positioning setting during motion and start command

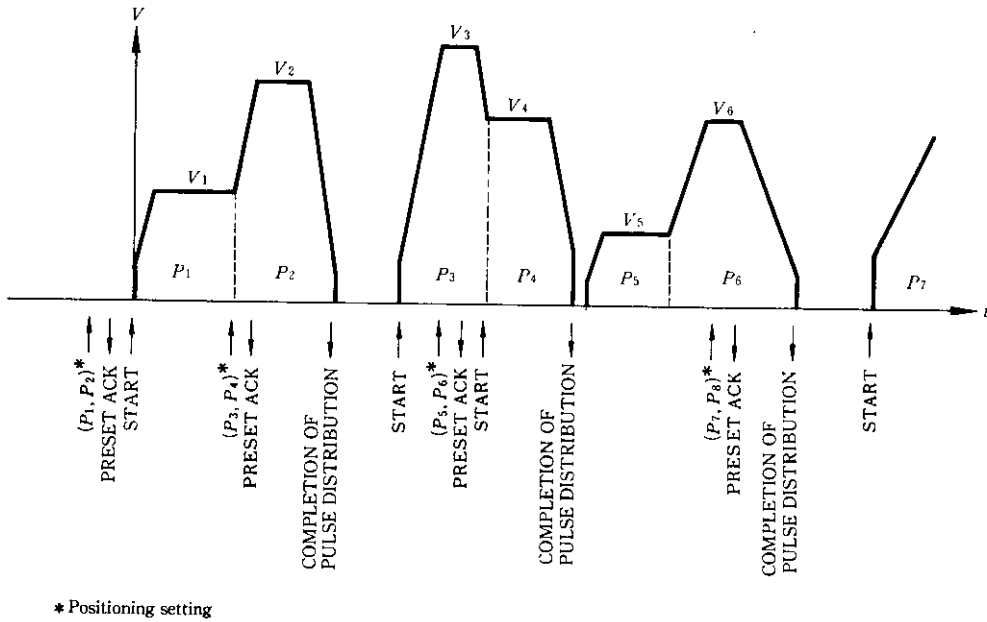


Fig. 4.22 Positioning Setting during Motion and Start Command

(d) Temporary pausing in incremental mode

Temporary pausing in incremental mode cancels the remaining distance $|P_2 - P'_2|$. Within the asterisked (*) range, the start command of the next positioning is canceled. Within the asterisked (*) range, setting of the next positioning is not canceled.

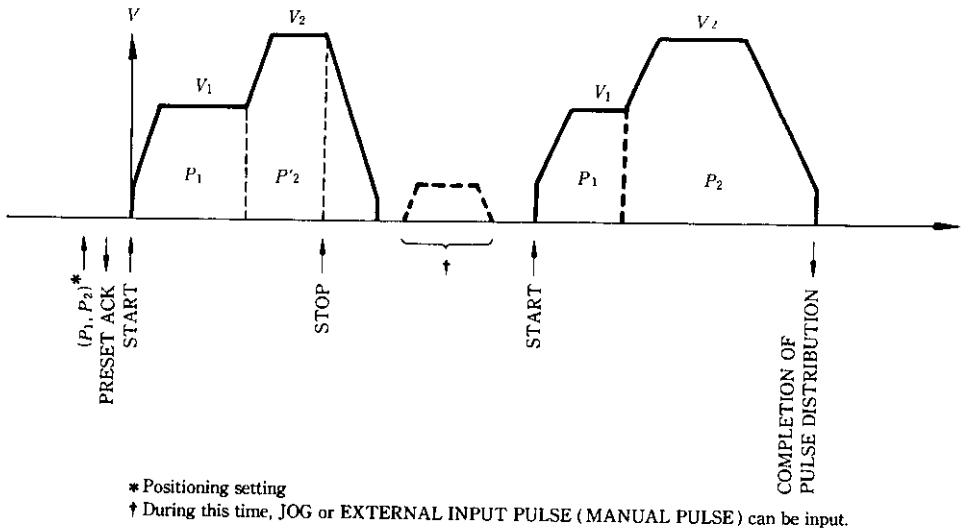


Fig. 4.23 Temporary Pausing in Incremental Mode

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

(4) 2-Step Speed Pattern in Absolute Mode

(a) Basic pattern

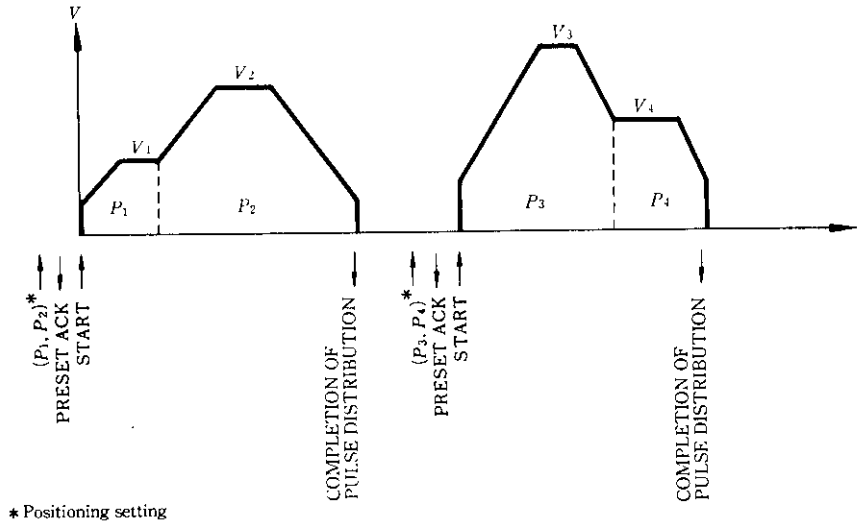
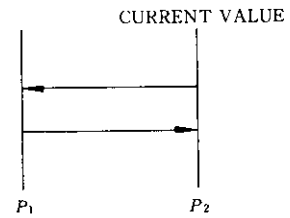


Fig. 4.24 Basic Pattern in Absolute Mode

When the operational direction of the setting is reversed between the first and second steps an error occurs.



(b) Positioning setting during motion

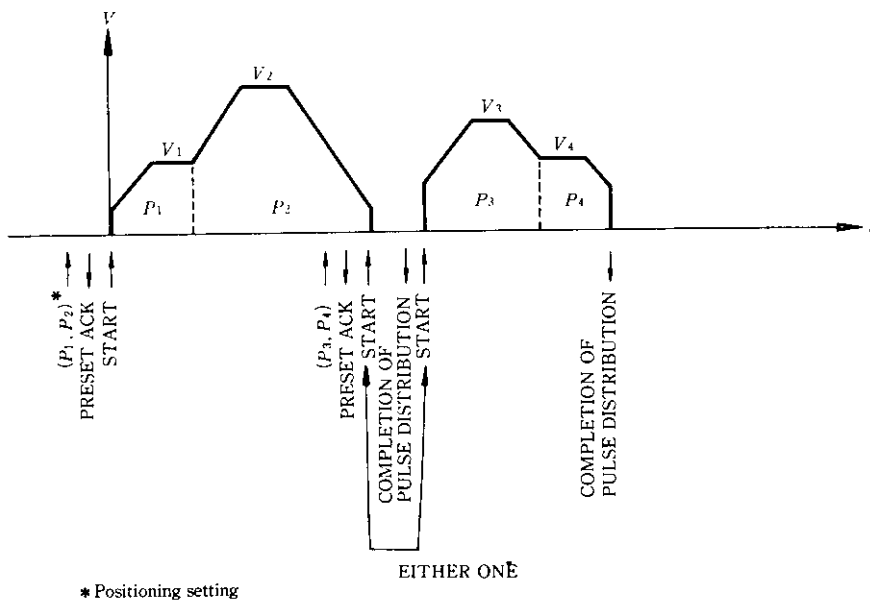
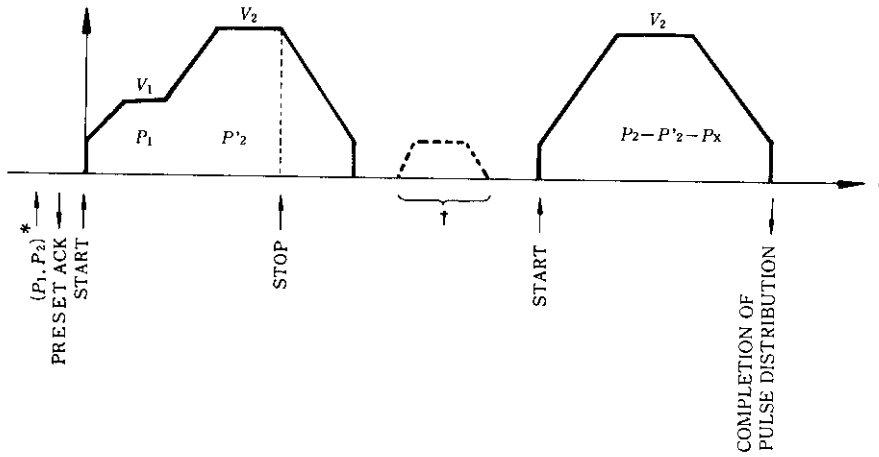


Fig. 4.25 Positioning Setting during Motion

(c) Temporary pausing in absolute mode

After temporary pause in absolute mode, restart completes remaining distance unless new positional setting (including that in the course of motion) is made.



* Positioning setting

† During this time, JOG or EXTERNAL INPUT PULSE (MANUAL PULSE) can be input.

Fig. 4.26 Temporary Pausing in Absolute Mode

(d) Precaution on 2-step speed pattern in absolute mode P_1/P_2 setting is restricted in absolute mode. If setting causes a reversing motion during the operation, setting error is detected to disable operation.

Decision / Positioning	Enable	Disable
	FWD Run	
REV Run		

4.2.3 Automatic Positioning Operation Patterns (Cont'd)

- (e) Shown below is the execution of automatic positioning according to GL20. Activation is programmed under conditions: linear acceleration time 50 ms, speed 5,000 pps, bias speed 500 pps and distance 5,555 (pulses) toward the plus area (forward rotation).

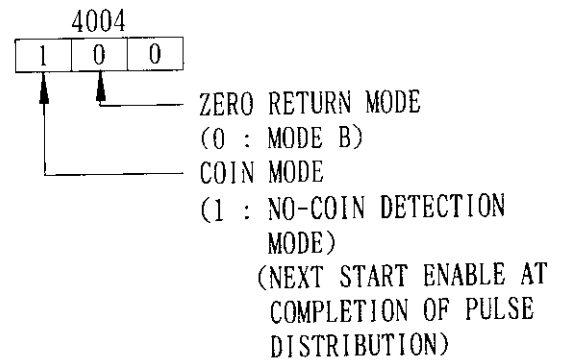
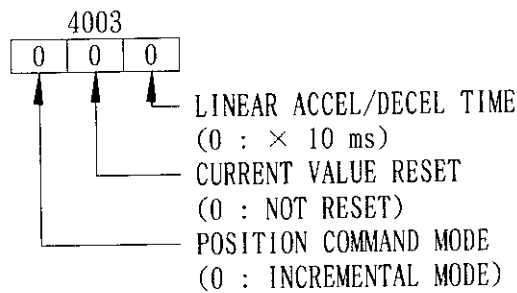
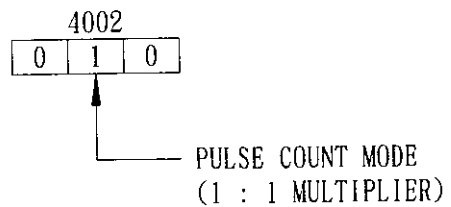
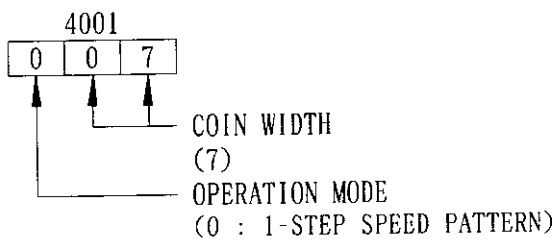
Switch (2SW) and initial settings are as follows :

<Switch setting>

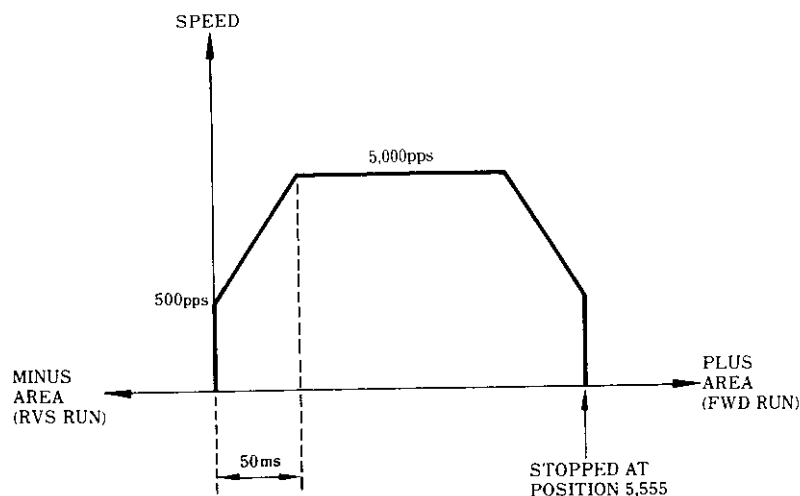
2SW-3 : For GL20 (6 digits)

2SW-4 : $\times 10$ pps

<Initial setting>



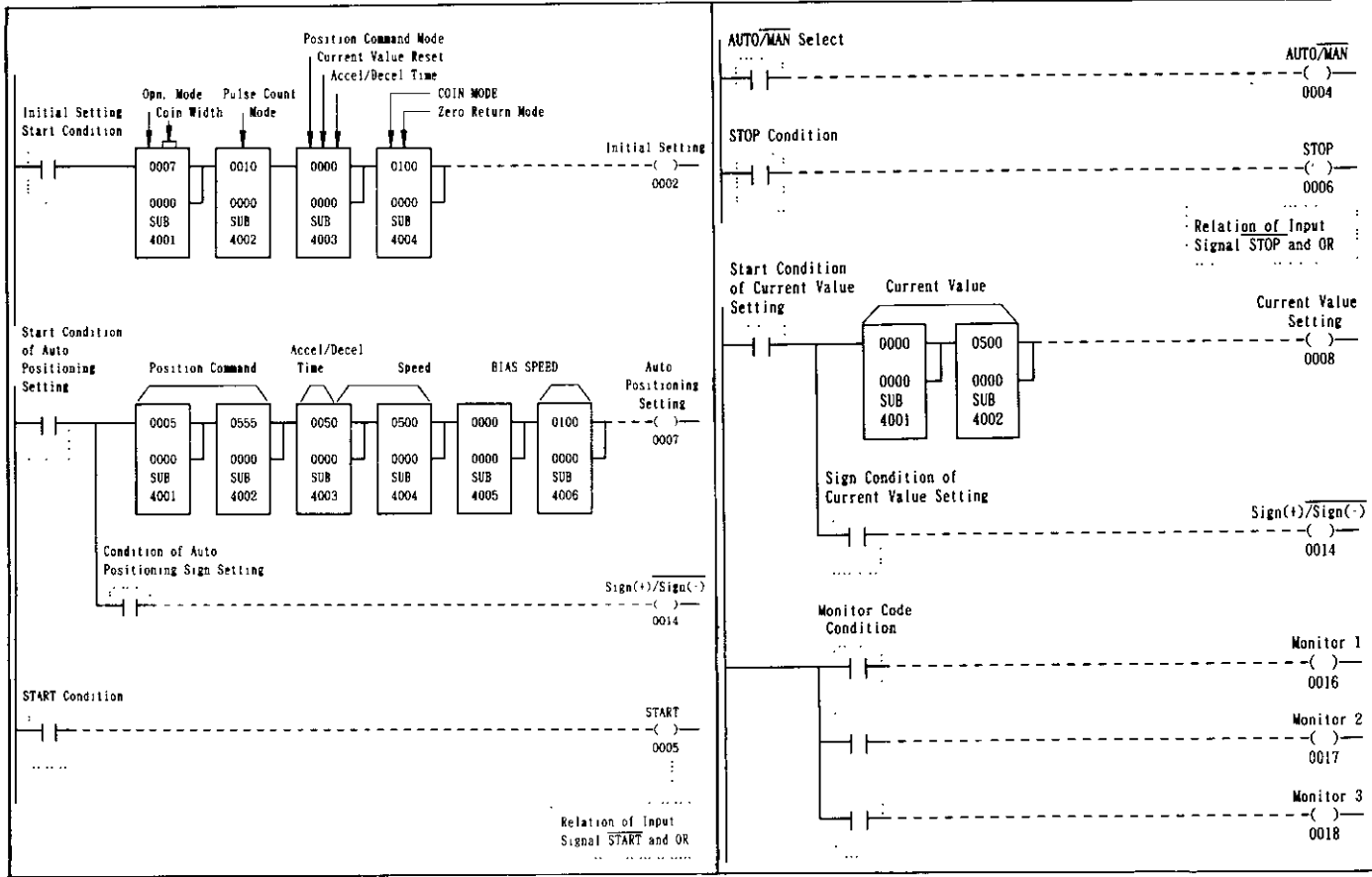
<Motion>



4.2.3 Automatic Positioning Operation Patterns (Cont'd)

GL20 Auto Positioning Action Diagram

GL20 Ladder Diagram for Other Settings



4.3 ZERO RETURN

Zero return is possible in either mode A or B, which must be selected in the initial setting. Operation is effective when the output coil "AUTO/MAN" is turned on. Zero return is operated by both inputs of phase-C pulse and "DECEL LS."

(1) Zero Return in Mode A

① Operation

When zero return (FWD or RVS) command is turned on, the machine starts moving toward the zero position in the predetermined bias speed, linear accel/decel time and at a preset steady speed. When the external input signal DECEL LS ON is detected, the machine decelerates down to creep speed (V_c). The first phase-C pulse after arrival at creep speed becomes the zero point.

When the module detects the zero point, the current command value and the current feedback value are cleared, and the external output signal CLR is output. In addition, the input relay "zero return pulse distribution end" is turned on.

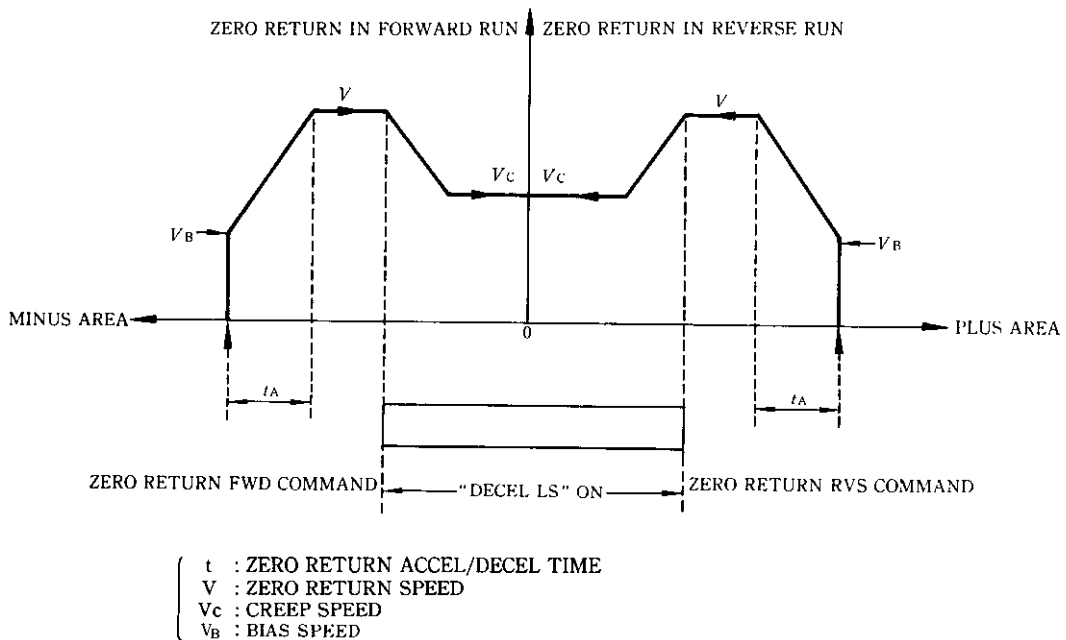


Fig. 4.27 Zero Return in Mode A

4.3 ZERO RETURN (Cont'd)

② Zero return speed and stopping accuracy

If the zero return speed is too high, the creep speed achieving position varies due to deviation (5 ms max.) in DECEL LS signal detection time. Therefore, a stop position error corresponding to one rotation may occur if dog adjustment is poor.

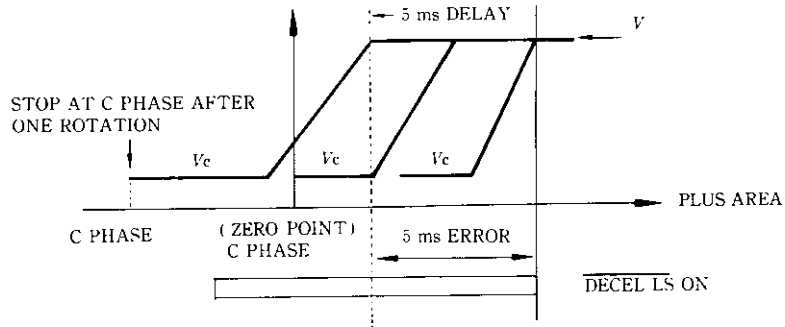


Fig. 4.28

(2) Zero Return in Mode B

① Operation

When turning on the zero return (FWD or RVS) command, the machine begins moving to the zero point in the predetermined bias speed, linear accel/decel time and at the preset steady speed. On detection of the external input signal DECEL LS ON, speed is reduced down to the creep speed (V_c). The first phase-C pulse after arrival at the creep speed becomes the zero point.

The module clears present values of command and feedback after detecting the zero point, and outputs "CLR." Then input relay "completion of zero return pulse distribution." is turned on.

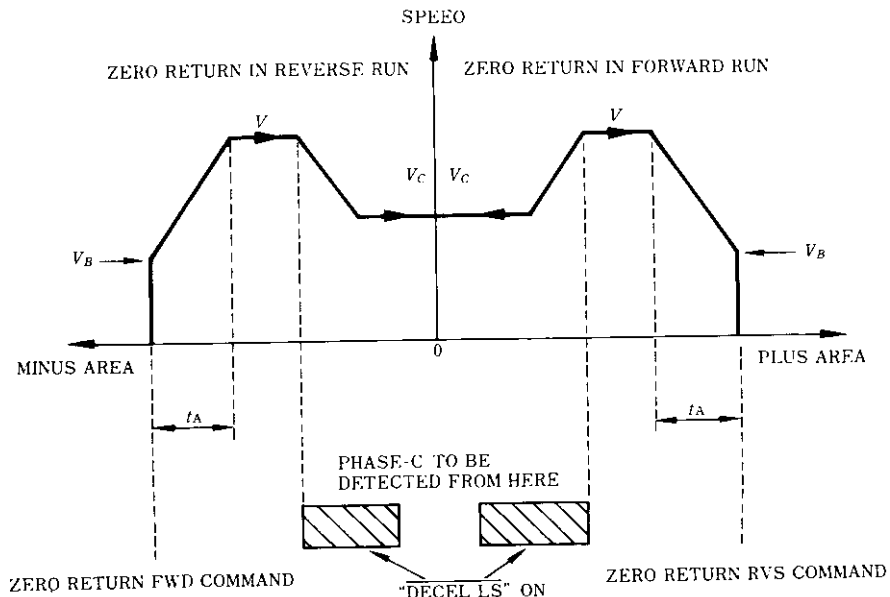


Fig. 4.29 Zero Return in Mode B

(3) Setting Items and Range Required for Zero Return

Table 4.4 Setting Item and Range at Zero Return

No	Item	Range	Remarks
1	Steady Speed V_1	$(1\sim 9,999) \times 10\text{pps}$ $(1\sim 9,999) \times 20\text{pps}$	Switch selection $\times 10\text{pps} / \times 20\text{pps}$
2	Creep Speed V_C	$(1\sim 9,999) \times 10\text{pps}$ $(1\sim 9,999) \times 20\text{pps}$	
3	Bias Speed V_B	$(0\sim 999) \times 10\text{pps}$ $(0\sim 999) \times 20\text{pps}$	
4	Linear Accel/Decel Time t_A	$(1\sim 99) \times 10\text{ms}$ $(1\sim 99) \times 0.1\text{s}$	Selected by initial setting $\times 10\text{ms} / \times 0.1\text{s}$

Note:

1. An error occurs when speed is set as $V_C > V$ (Error Code:20)
2. An error occurs when speed is set as $V_B > V$ (Error Code:20)
3. Any relation of V_B and V_C is accepted.
4. When speed is set as $V_B = V$, automatically $t_A = 0$ is set.
 $t_A \neq 0$ is disregarded.

(4) Precautions for Zero Return

- Error is detected (error code : 21) if the zero return command is used without zero setting.
- Even though the zero return command is turned on, it is disregarded during automatic positioning.
- When temporarily stopping operation at zero return speed, zero return operation will not be recovered unless the zero return command is turned on again.
- Zero return operation is disregarded immediately after completion of the previous zero return. It is possible again after any of automatic positioning, JOG or handle operations.
- When DECEL LS is turned on, the zero return command is disregarded(error code:23).
The command needs to be issued after movement to the DECEL LS OFF position by any operation other than zero return.
- When temporarily pausing operation during zero return, or turning off the output coil "AUTO/MAN", the machine stops in the specified linear accel/decel time.

4.3 ZERO RETURN (Cont'd)

(5) Shown below is the zero return in mode B according to GL20.

The figure below corresponds to zero return from the X position in the plus area by reverse movement. Steady speed, Linear accel/decel time, bias speed and creep speed are assumed to be set at 1,000 pps, 100 ms 50 pps and 100 pps, respectively.

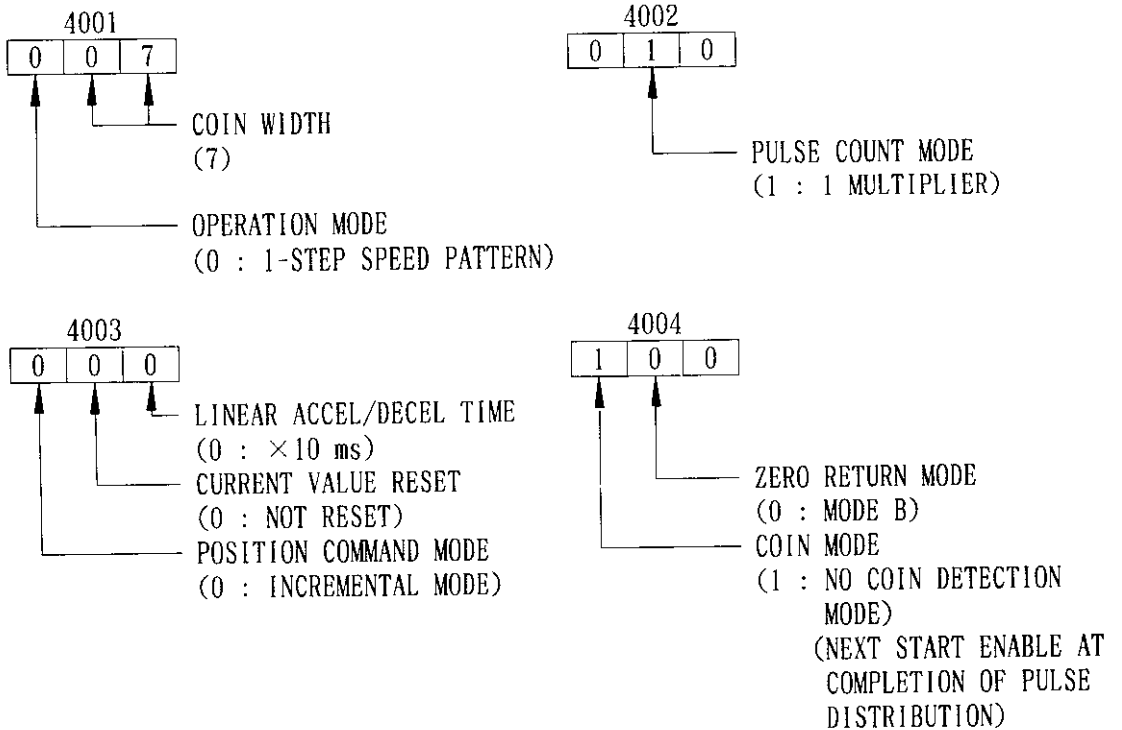
Switch (2SW) and initial settings are as follows :

<Switch Setting>

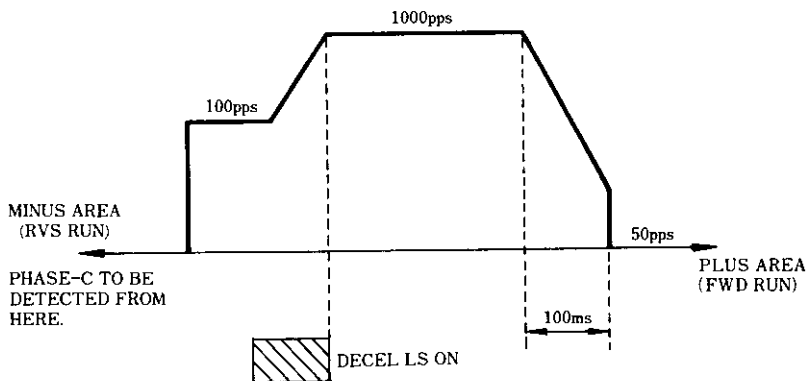
2SW-3 : For GL20(60 digits)

2SW-4 : $\times 10$ pps

<Initial Setting>



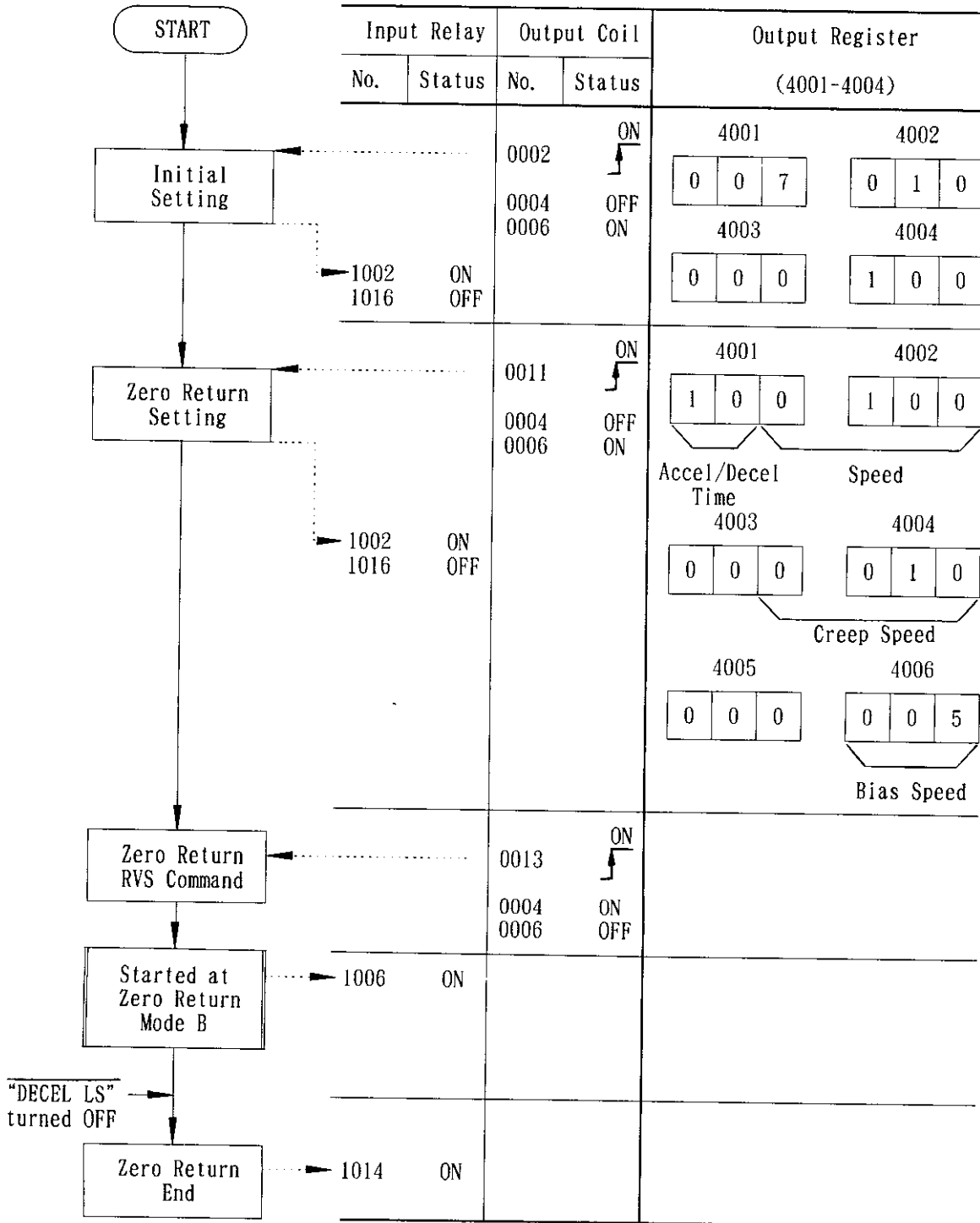
<Motion>



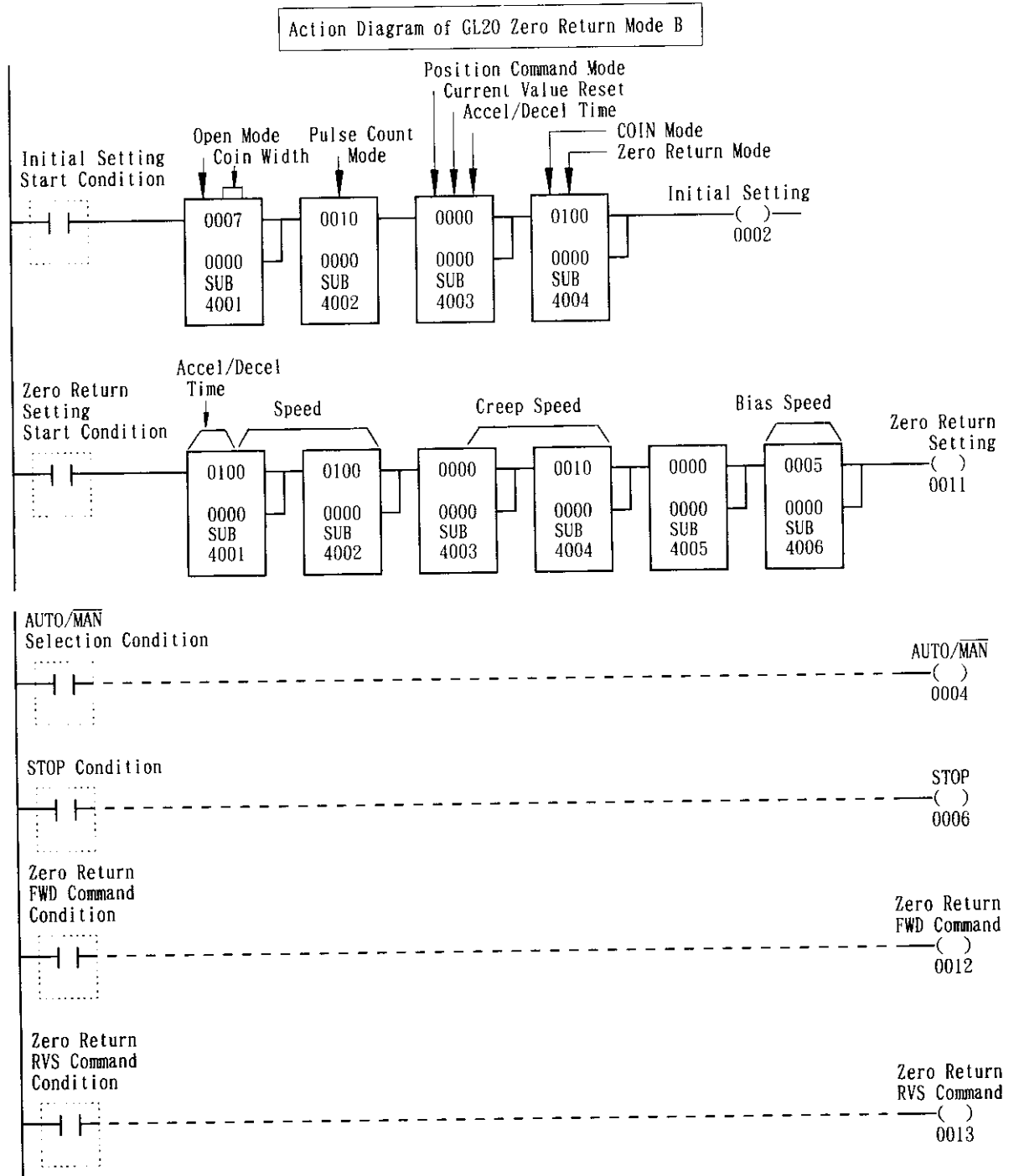
Zero Return Mode B Operation

B2823 OPERATION

CPU Module (GL20) Operation



4.3 ZERO RETURN (Cont'd)



4.4 JOG OPERATION

JOG operation is selectable between JOGL (low speed) and JOGH (high speed).

(1) Basic Operation

When turning on the JOGL or JOGH command, operation starts so as to meet the predetermined JOGL or JOGH bias speed, linear accel/decel time and speed, and the machine decelerates and stops when the JOG command is turned off. Deceleration and stop also occur when the STOP command is turned on.

JOGL/JOGL is prior to call up operation. During JOGL operation, JOGH is disregarded, and JOGL is disregarded during the course of JOGH operation. In case JOGL and JOGH are turned on simultaneously, priority is given to JOGL. Attempt to change sign is disregarded during JOG operation. Decel/stop occurs when turning to the AUTO mode (turning on the output coil AUTO/MAN) during JOG operation.

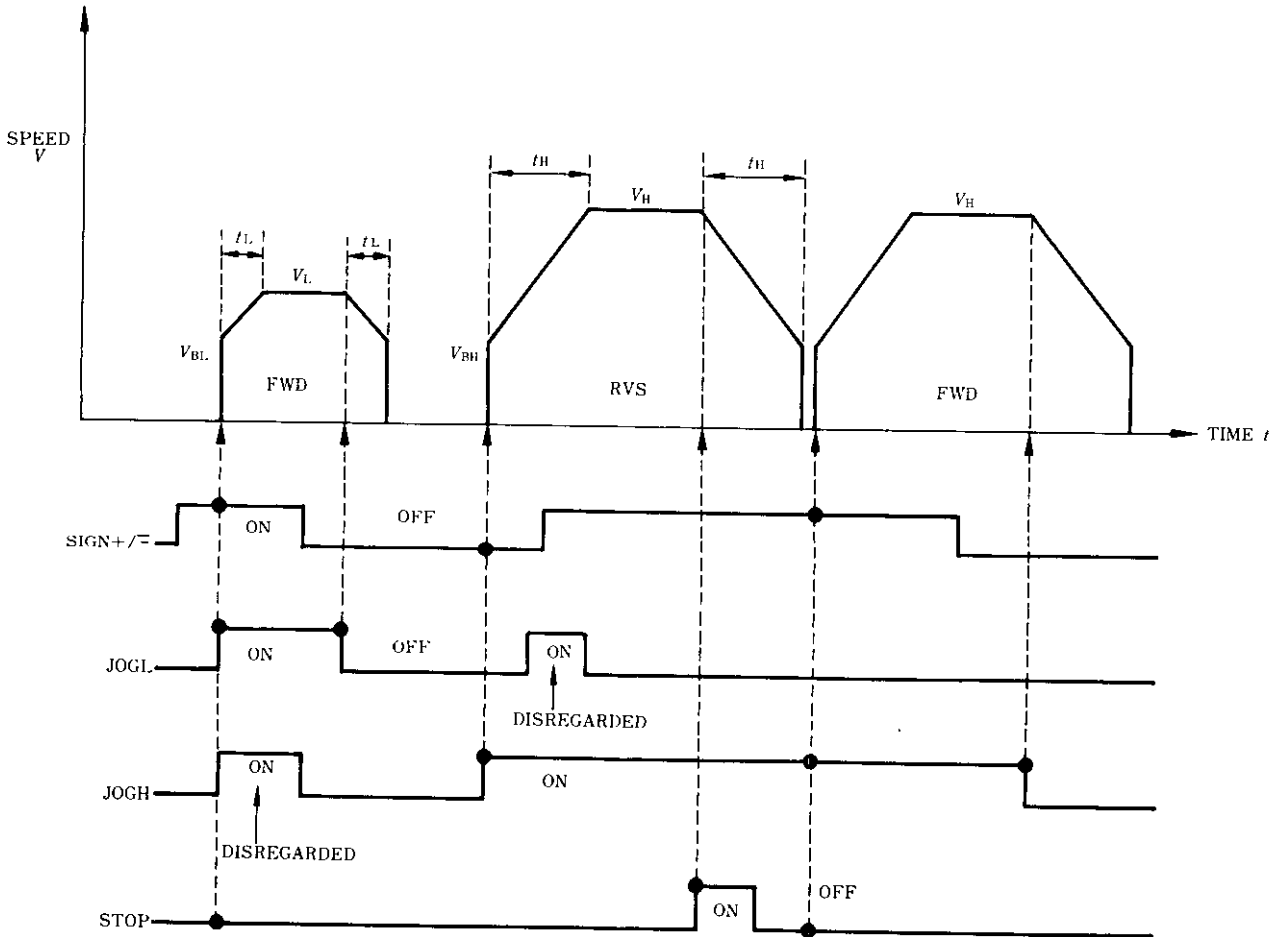


Fig. 4.30 JOG Action Time chart

4.4 JOG OPERATION (Cont'd)

(2) Setting Items and Range Required for JOG Operation

Table 4.5 Setting Item and Range at JOG Operation

No	Item	Range	Remarks
1	Steady Speed V_H, V_L	$(1\sim 9,999) \times 10\text{pps}$ $(1\sim 9,999) \times 20\text{pps}$	$\times 10\text{pps} / \times 20\text{pps}$
2	Bias Speed V_{BH}, V_{BL}	$(0\sim 999) \times 10\text{pps}$ $(0\sim 999) \times 20\text{pps}$	
3	Linear Accel/Decel Time t_{AH}, t_{AL}	$(1\sim 99) \times 10\text{ms}$ $(1\sim 99) \times 0.1\text{s}$	Selected by initial setting $\times 10\text{ms} / \times 0.1\text{s}$

Note:

1. An error occurs when speed is set as $V_{BH} > V_H$ at JOGH operation or $V_{BL} > V_L$ is set at JOGL operation. (Error code : 20)
2. When speed is set as $V_{BH} = V_H$, or $V_{BL} = V_L$, automatically $t_{AH} = 0$ or $t_{AL} = 0$ is set. $t_{AH} \neq 0$ or $t_{AL} \neq 0$ is disregarded.

(3) Precautions for JOG Operation

- ① When the operation is forced to stop by $\overline{\text{FWD OVLS}}$ or $\overline{\text{RVS OVLS}}$ during JOGH or JOGL operation and only OVER LS is released, the operation is activated again.

(4) Example of JOG Action Time Chart (GL20)

JOGH operation toward plus area first, then JOGL operation.
 Where, JOGH linear accel/decel time = 500 ms, steady speed = 5000pps,
 bias speed = 500pps
 JOGL linear accel/decel time = 250 ms, steady speed = 2500pps,
 bias speed = 200pps

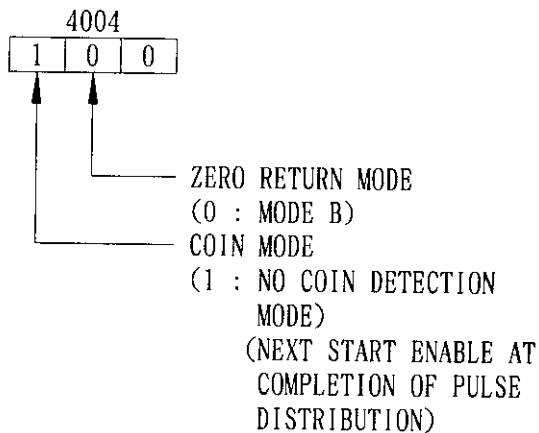
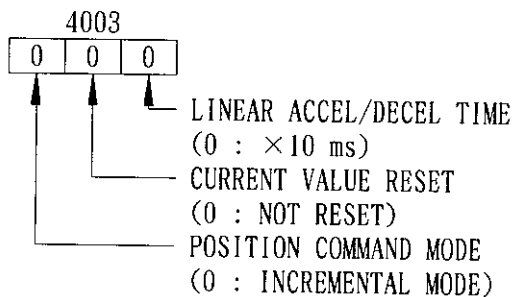
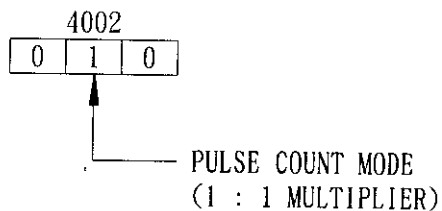
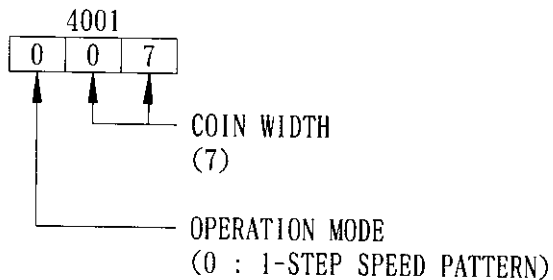
Switch (2SW) and initial settings are as follows :

<Switch Setting>

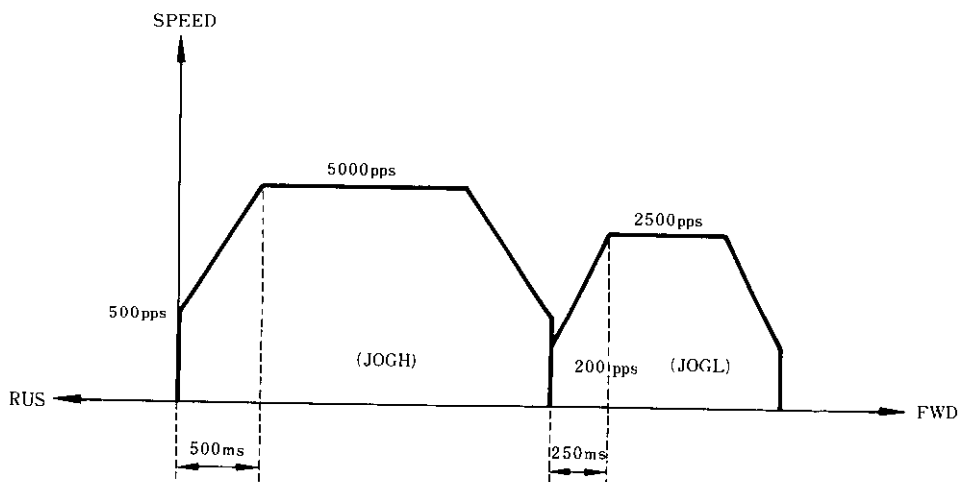
2SW-3 : For GL20(6 digits)

2SW-4 : $\times 10$ pps

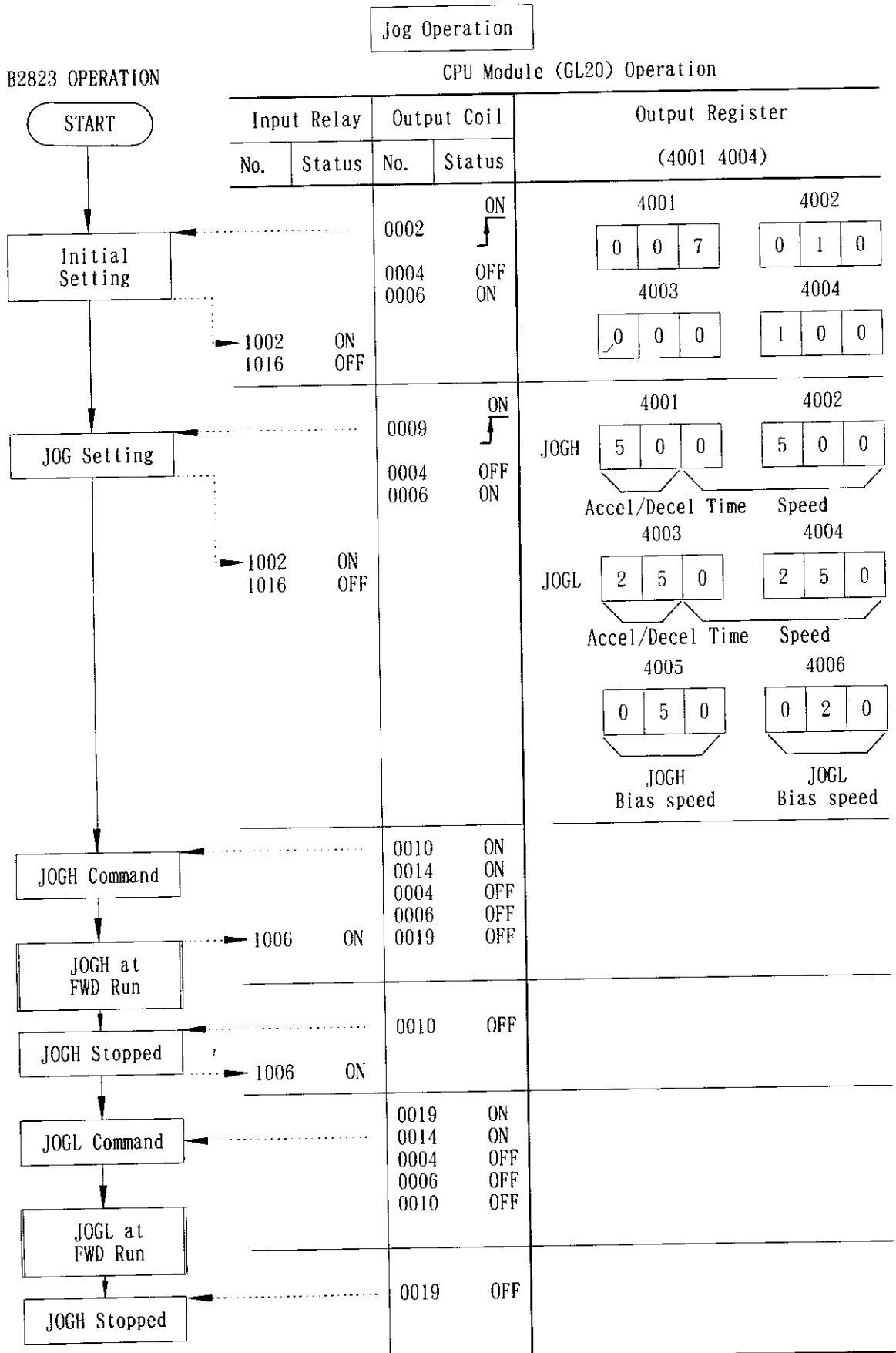
<Initial Setting>



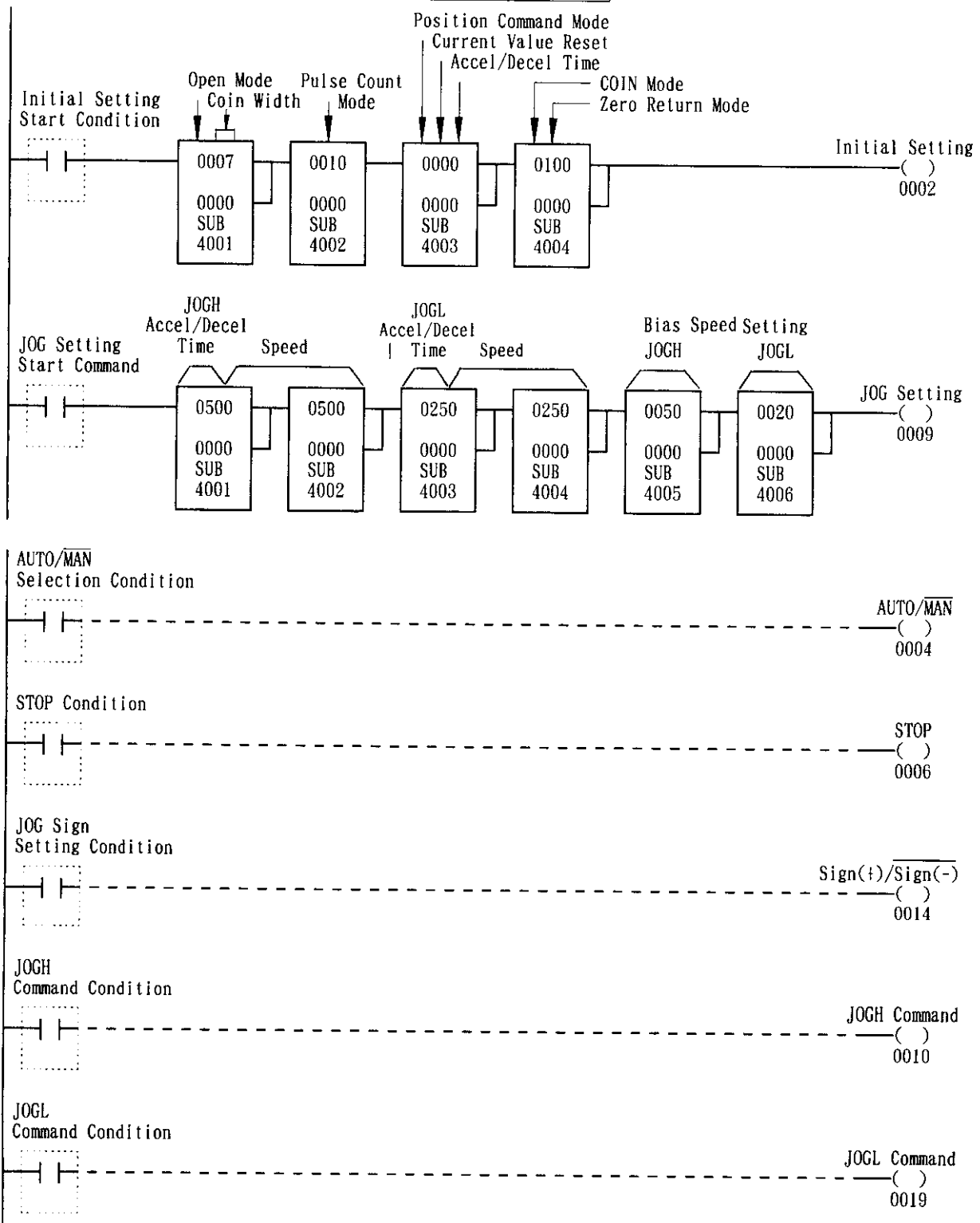
<Motion>



4.4 JOG OPERATION (Cont'd)

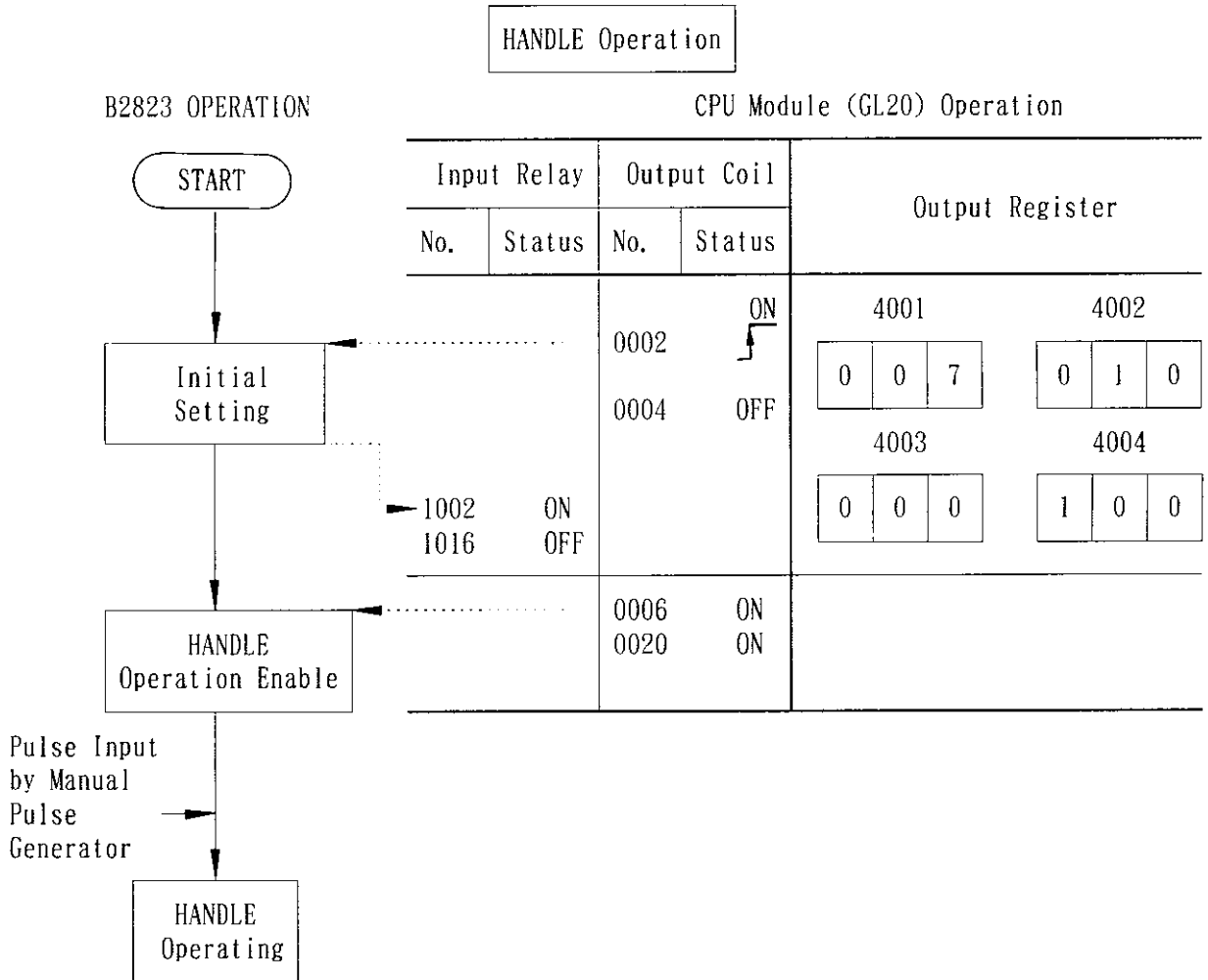


GL20 JOG Action Diagram



4.5 HANDLE OPERATION

- (1) Handle operation is enabled by external input of signals from the manual pulse generator. When turning the handle in the positive or negative direction, movement occurs in the relevant direction. Phase-A or -B input signal from manual pulse generator is $\times 1$ multiplier count number only.



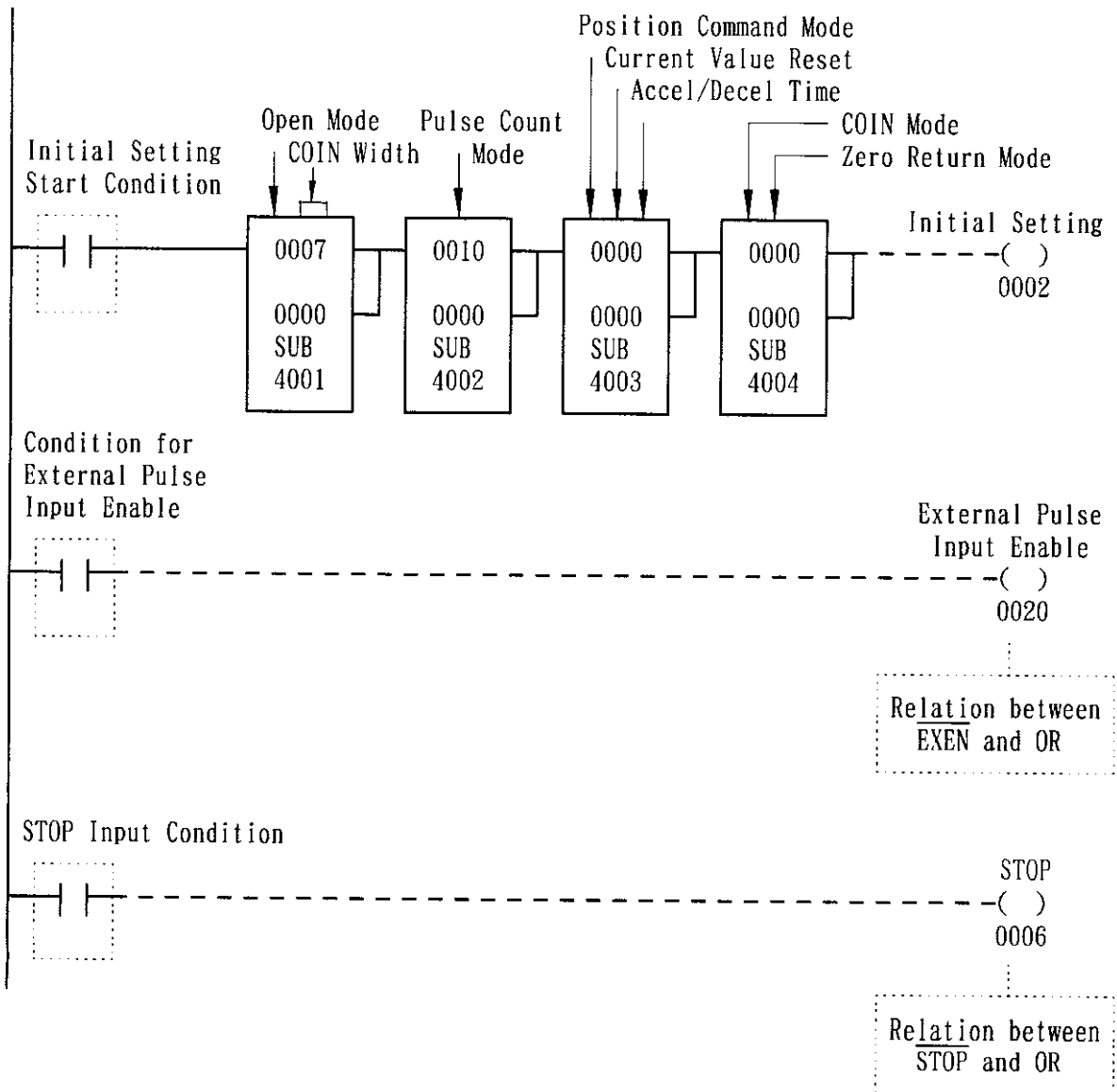
(2) Precautions for HANDLE Operation

HANDLE operation must be executed when the following three conditions are satisfied.

- ① Other operations have already finished.
- ② "STOP" is turned ON or EXT. STOP is turned ON.
- ③ "EXT. COMMAND PULSE INPUT ENABLE" is turned ON or EXT. COMMAND PULSE INPUT ENABLE is turned ON.

4.5 HANDLE OPERATION (Cont'd)

GL20 HANDLE Action Diagram



5. INTERNAL INTERFACE

5.1 I/O ALLOCATION OF CPU MODULE

For interface between the CPU module and B2823, output coil, input relay, output register and input register are allocated. I/O allocation points of the CPU module are listed in Table 5.1. Binary specification is required for allocating the output and input registers.

Table 5.1 Number of I/O Allocations of CPU Module

I/O Allocation	Points/Registers	Signal Flow	
		CPU Module	B2823
Output	24 or 16 Points	→	←
Input Relay	16 Points	←	→
Output Register	6 Registers	→	←
Input Register	6 Registers	←	→

5.2 OUTPUT COIL (CONTROL SIGNAL) FROM CPU MODULE TO B2823

(1) List of Output Coils

24 (or 16) output coils are provided and used as the control signals from the CPU module to B2823. Table 5.2 lists the output coils.

Table 5.2 List of Output Coils

GL20	GL60S	Signal Name
0001 + 8n	00001 + 8n	Module reset
0002 + 8n	00002 + 8n	Initial setting
0003 + 8n	00003 + 8n	Not used
0004 + 8n	00004 + 8n	AUTO/ MAN
0005 + 8n	00005 + 8n	START
0006 + 8n	00006 + 8n	STOP
0007 + 8n	00007 + 8n	Auto positioning setting
0008 + 8n	00008 + 8n	Current value setting
0009 + 8n	00009 + 8n	JOG setting
0010 + 8n	00010 + 8n	JOGH command
0011 + 8n	00011 + 8n	Zero return setting
0012 + 8n	00012 + 8n	FWD command for zero return
0013 + 8n	00013 + 8n	RVS command for zero return
0014 + 8n	00014 + 8n	Sign(+)/Sign(-)
0015 + 8n	00015 + 8n	Error code reset
0016 + 8n	00016 + 8n	Monitor 1
0017 + 8n	00017 + 8n	Monitor 2
0018 + 8n	00018 + 8n	Monitor 3
0019 + 8n	00019 + 8n	JOGL command
0020 + 8n	00020 + 8n	External pulse input enable (Manual pulse input enable)
0021 + 8n	00021 + 8n	Not used
0022 + 8n	00022 + 8n	Not used
0023 + 8n	00023 + 8n	Not used
0024 + 8n	00024 + 8n	Not used

At 16-point allocation, these signals are OFF in the module.

n = 0, 1, 2

Show the reference No. at output coil allocation.

(2) Contents of Each Output Coil

24 output coils function as control signals which are detailed in Table 5.3. B2823 operates while confirming the ON/OFF condition of each output coil. (See Table 5.4 "Output Coil Conditions.")

Table 5.3 Output Coils and Their Contents

Signal Name	Description
Module Reset	Module reset command. Upon receiving module reset, B2823 initializes the internal RAM and external input signal, and resets various setpoints, current value and deviation counter to zero. Effective when turned from OFF to ON. (<input type="checkbox"/>) Module becomes READY after approximately 0.5 second. Then execute each set command.
Initial Setting	Initial setting command of B2823 (initial value preset in output register). Effective when turned from OFF to ON. (<input type="checkbox"/>) Since B2823 clears various operational settings on reception of the initial set command, resetting each set value is required.
AUTO/ <u>MAN</u>	Selection of auto or manual operation. ON ... Selects auto operation (automatic positioning, zero return) OFF .. Selects manual operation (JOG operation). Independent of handle operation.
START	Start command for automatic positioning. Effective when turned from OFF to ON. (<input type="checkbox"/>)
STOP	Positioning stop command. Effective at ON. Stops the machine in linear accel/decel time.
Automatic Positioning	Position command automatic positioning and setting command for linear accel/decel time, speed and bias speed. (Relevant values are preset in output register.) Effective when turned from OFF to ON. ON only for scan 1 in case of 1-step speed pattern and only for scan 2 in case of 2-step speed pattern (1-step speed pattern) "Auto positioning setting" Output coil OFF <input type="checkbox"/> 1 Scan <input type="checkbox"/> ON Output register <input type="checkbox"/> P,tA,V,VB <input type="checkbox"/> (2-step speed pattern) "Auto positioning setting" Output coil OFF <input type="checkbox"/> 1 Scan : 2 Scan <input type="checkbox"/> ON Output register <input type="checkbox"/> P1,t1,V1,VB:P2,t1,V2,VB <input type="checkbox"/>

5.2 OUTPUT COIL (CONTROL SIGNAL) FROM CPU MODULE TO B2823 (Cont'd)

Table 5.3 Output Coils and Their Contents (Cont'd)

Signal Name	Description													
Current Value Setting	Command for updating current value (current value preset in output register). Effective when turned from OFF to ON.													
JOG Setting	Command for setting accel/decel time, speed and bias speed in JOGH/JOGL operation. (Current value is set in output register.) Effective when turned from OFF to ON.													
JOGL Command	Command of JOGH (high speed) operation. ON ... Starts operation. OFF .. Stops operation.													
Zero Return Setting	Command for setting linear accel/decel time, speed, creep speed and bias speed in zero return. (Relevant values are preset in output register.) Values remain the same between FWD and RVS. Effective when turned from OFF to ON.													
Zero Return FWD Command	Start command for zero return in forward rotation. Effective when turned from OFF to ON.													
Zero Return RVS Command	Start command for zero return in reverse rotation. Effective when turned from OFF to ON.													
Sign(+)/Sign(-)	<p>Command for selecting plus/minus area or forward/reverse rotation linked with other settings or commands.</p> <p>(1) The following is effective when turning "current value setting" from OFF to ON.</p> <p style="padding-left: 40px;">ON : Commands plus area. OFF : Commands minus area.</p> <p>(2) The following is effective when turning "positioning setting" from OFF to ON.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Operation Mode</th> <th>Sign(+)/Sign(-)</th> <th>Command</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Incremental Mode</td> <td>ON</td> <td>Forward</td> </tr> <tr> <td>OFF</td> <td>Reverse</td> </tr> <tr> <td rowspan="2">Absolute Mode</td> <td>ON</td> <td>Plus area</td> </tr> <tr> <td>OFF</td> <td>Minus area</td> </tr> </tbody> </table> <p>(3) The following is effective when JOG operation (JOGL or JOGL command) is activated.</p> <p style="padding-left: 40px;">ON : Commands forward rotation. OFF : Commands reverse rotation.</p>	Operation Mode	Sign(+)/Sign(-)	Command	Incremental Mode	ON	Forward	OFF	Reverse	Absolute Mode	ON	Plus area	OFF	Minus area
Operation Mode	Sign(+)/Sign(-)	Command												
Incremental Mode	ON	Forward												
	OFF	Reverse												
Absolute Mode	ON	Plus area												
	OFF	Minus area												
Error Code Reset	Command for resetting error code. Effective when turned from OFF to ON. (All error codes stored in memory are cleared.)													

Table 5.3 Output Coils and Their Contents (Cont'd)

Signal Name	Description								
Monitor 1 2 3	Monitor Code			Contents					
	Mon-itor 1	Mon-itor 2	Mon-itor 3	1st, 2nd Input Registers	3rd, 4th Input Registers	5th Input Register	6th Input Register	Sign(+)/(-) Input Relay	Z-Step speed Monitor 1,2 Input Relay
	0	0	0	Current feedback value	Current command value	0	0	×	×
	1	0	0		Error code	0	0	×	×
	0	1	0		Current value setting	0	0	○	×
	1	1	0	Current command value	Error code	0	0	×	×
	0	0	1	Auto position command value	Auto accel/decel time, speed	0	Bias Speed	○	○
	1	0	1	JOGH accel/decel time, speed	JOGL accel/decel time, speed	JOGH Bias speed	JOGL Bias speed	×	×
	0	1	1	Accel/decel time, speed of zero return	Creep speed	0	Bias speed	×	×
	1	1	1	Initial setting			0	0	×
0 : OFF 1 : ON			0 : Value of Input Registers			○ : Effective × : Ineffective			
Note : In case of 2-step speed pattern, (P ₁ , t ₁ , V ₁ , V _B) and (P ₂ , t ₁ , V ₂ , V _B) are alternately displayed about every 3 seconds.									
JOGL Command	Command for JOGL (low speed) operation ON : Starts operation. OFF : Stops operation.								
External Pulse Input Enable	Enables input of external pulse. Upon input of external command pulse (from manual pulse generator), handle operation is enabled. Effective at ON.								

5.2 OUTPUT COIL (CONTROL SIGNAL) FROM CPU MODULE TO B2823 (Cont'd)

(3) List of Output Coil Conditions

Table 5.4 lists the output coil conditions. Any setting or command that does not meet the ON/OFF condition of output coil is judged as an error or disregarded according to the internal processing of B2823.

Table 5.4 Output Coils and B2813 Functions

Reference No.	1	4	6	2	8	7	11	9	5	12	13	10	19	20	15
Coil Name Module Function	Module Reset	AUTO/ MAN	STOP	Initial Setting	Current Value Setting	Auto Positioning Setting	Zero Return Setting	JOG Setting	START	Zero FWD Point	Zero RYS Point	JOGH Command	JOGL Command	External Pulse Input Enable	Error Code Reset
Module Reset															
STOP	—		1	—	—	—	—	—			—				
Initial	—	0	1		—	—	—	—			—				
Current Value	—		1	—		—	—	—							
Auto Positioning	—			—	—		—	—							
Zero Return	—	0	1	—	—	—		—							
JOG	—	0	1	—	—	—	—		—	—	—				
Auto Positioning Start	—	1	0			—		—		—	—				
Zero Return Start at FWD Run	—	1	0			—		—	—		—				
Zero Return Start at RVS Run	—	1	0			—		—	—	—					
JOGH	—	0	0			—						1	0		
JOGL	—	0	0			—						0	1		
HANDLE	—		1	—										1	
Error Code Reset	—			—											

<Notes for Table 5.4>

1. 1 : ON, 0 : OFF, (F) : OFF to ON, — : status remains unchanged, blank : not applicable.
 (F), ① : coil finally validated after conditions of other coils are arranged.
2. Priority is given to JOGH or JOGL operation depending on which is selected earlier, JOGH or JOGL command. At this time, the ON/OFF status of the later command is disregarded. If both commands are turned on simultaneously, priority is given to the JOGL command.
3. If two or more output coils are turned on simultaneously among START, zero return FWD command or RVS command, commands are invalidated with no error code assigned.

(1) For setting zero return in forward rotation

Output Coil	ON/OFF Condition
AUTO/ $\overline{\text{MAN}}$	OFF
STOP	ON
Module Reset	—
Other Various Settings	—

} Finally, zero return setting
(F) : OFF to ON

(2) For starting zero return in forward rotation

Output Coil	ON/OFF Condition
AUTO/ $\overline{\text{MAN}}$	ON
STOP	OFF
Module Reset	—
Various other Operation Commands	—

} Finally, zero return FWD command
(F) : OFF to ON

(4) Precautions for Output Coil Condition

- ① "MODULE RESET" is always acceptable. When it is accepted during operation, pulse distribution stops at decel time 0.
- ② Execution of "INITIAL SETTING" and "CURRENT VALUE SETTING" during operation causes an error. (Error code : 20)
- ③ Simultaneous multi-setting causes an error. (Error code : 20)
- ④ Only auto positioning operation can be set with next start during operation.
- ⑤ When AUTO/ $\overline{\text{MAN}}$ is turned OFF during AUTO mode operation, B2823 decelerates to stop at a linear accel/decel time.

5.3 INPUT RELAY (CONTROL SIGNAL) FROM B2823 TO CPU MODULE

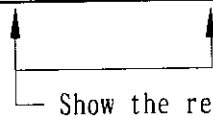
(1) List of Input Relays

16 input relays are provided and used as the control signals from B2823 to the CPU module. Table 5.5 lists the input relays.

Table 5.5 List of Input Relays

GL20	GL60S	Signal Name
1001+ 8n	10001+ 8n	READY
1002+ 8n	10002+ 8n	PRESET ACK
1003+ 8n	10003+ 8n	SIGN(+)/SIGN(-)
1004+ 8n	10004+ 8n	Multi-step speed monitor 1
1005+ 8n	10005+ 8n	Multi-step speed monitor 2
1006+ 8n	10006+ 8n	PLUS/MINUS
1007+ 8n	10007+ 8n	Current value over
1008+ 8n	10008+ 8n	FWD OVER LS
1009+ 8n	10009+ 8n	COIN
1010+ 8n	10010+ 8n	DECEL LS
1011+ 8n	10011+ 8n	ERROR
1012+ 8n	10012+ 8n	Fault
1013+ 8n	10013+ 8n	RVS OVER LS
1014+ 8n	10014+ 8n	Zero return pulse output completion
1015+ 8n	10015+ 8n	Positioning pulse output completion
1016+ 8n	10016+ 8n	PRESET NAK

n=0, 1, 2



— Show the reference No. at input relay allocation.

(2) Contents of Input Relay

16 input relays connect the control signals which are detailed in Table 5.6.

Table 5.6 Input Relays and Their Contents

Singal Name	Description													
READY	The result of B2823 self-diagnosis is indicated. Normally ON, but OFF in the event of malfunction (ROM total check error, RAM check error or WDT error). Turned OFF for about 50 to 500 ms on energization or module resetting.													
PRESET ACK	Turned ON for only one scan after normal completion of preset action (initial setting, current value setting, positioning setting, zero return setting, or jog setting) in B2823.													
Sign (+)/Sign (-)	<p>Indicates the command contents of sign(+)/sign(-) which are preset at the same time as the setting of "current value" and "auto positioning" during execution of monitoring.</p> <p>(1) When monitor code (0101) is "current value setting" ON : Plus range OFF : Minus range</p> <p>(2) When monitor code (001) is "auto position command value"</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Operation Mode</th> <th>Sign (+)/Sign (-)</th> <th>Command</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Incremental Mode</td> <td>ON</td> <td>Forward run</td> </tr> <tr> <td>OFF</td> <td>Reverse run</td> </tr> <tr> <td rowspan="2">Absolute Mode</td> <td>ON</td> <td>Plus area</td> </tr> <tr> <td>OFF</td> <td>Minus area</td> </tr> </tbody> </table> <p>Note: In case of multi-step speed pattern, the sign is monitored about every 3 seconds.</p>	Operation Mode	Sign (+)/Sign (-)	Command	Incremental Mode	ON	Forward run	OFF	Reverse run	Absolute Mode	ON	Plus area	OFF	Minus area
Operation Mode	Sign (+)/Sign (-)	Command												
Incremental Mode	ON	Forward run												
	OFF	Reverse run												
Absolute Mode	ON	Plus area												
	OFF	Minus area												
Multi-step Speed Pattern Monitor 1 Multi-step Speed Pattern Monitor 2	<p>Used when 2-step speed mode is selected for auto positioning operation. Indicates which set contents of 1- or 2-step is monitored during execution of "auto postioning setting" monitoring.</p> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Monitor</th> <th>1st Step</th> <th>2nd Step</th> </tr> </thead> <tbody> <tr> <td>Multi-step Speed Pattern Monitor 1</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>Multi-step Speed Pattern Monitor 2</td> <td>OFF</td> <td>OFF</td> </tr> </tbody> </table>	Monitor	1st Step	2nd Step	Multi-step Speed Pattern Monitor 1	OFF	ON	Multi-step Speed Pattern Monitor 2	OFF	OFF				
Monitor	1st Step	2nd Step												
Multi-step Speed Pattern Monitor 1	OFF	ON												
Multi-step Speed Pattern Monitor 2	OFF	OFF												
PLUS/MINUS	<p>Indicates the area of current value counter</p> <p>ON : Plus area OFF : Minus area</p>													
Current Value Over	<p>Control signal valid only in absolute mode. Turned ON when the current value counter in B2823 exceeds absolute position area.</p>													

5.3 INPUT RELAY (CONTROL SIGNAL) FROM B2823 TO CPU MODULE (Cont'd)

Table 5.6 INPUT Relay and Their Contents (Cont'd)

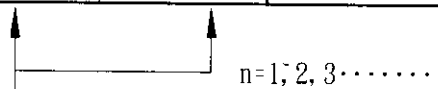
Signal Name	Description
Forward Over LS	Indicates $\overline{\text{FWD OVER LS}}$ input status. Turned ON when $\overline{\text{FWD OVER LS}}$ becomes ON (level "L").
COIN	Effective only when COIN DETECTION mode is specified. Always turned OFF in NO-COIN DETECTION mode. Calculates deviation of current values of command and feedback in JOG or ZERO RETURN operation and turned ON when the deviation is in the range of COIN detection width.
DECEL LS	Indicates the input status of external input signal DECEL LS. Turned ON when DECEL LS comes ON.
ERROR	Turns ON if B2823 detects any error. For error codes, refer to Sect, 9 "TROUBLESHOOTING."
FAULT	Indicates that B2823 is outputting external "FAULT" signal. For error codes, refer to Sect, 9 "TROUBLESHOOTING."
Reverse Over LS	Indicates $\overline{\text{RVS OVER LS}}$ input status. Turned ON when $\overline{\text{RVS OVER LS}}$ becomes ON.
Completion of Zero Return Pulse Output	Turns ON for only one scan upon completion of pulse output in zero return operation. Does not turn ON for temporary pausing. Effective when $\overline{\text{AUTO/MAN}}$ is ON.
Completion of Positioning Pulse Output	Turns ON for only one scan upon completion of pulse output in automatic positioning operation. Does not turn ON at the time of temporary pausing. Effective when $\overline{\text{AUTO/MAN}}$ is ON.
PRESET NAK	Turns ON for only one scan if data preset action in B2823 is abnormal.

5.4 OUTPUT REGISTER (SETTING DATA) FROM CPU MODULE TO B2823

To preset various setting data from the CPU module to B2823, four consecutive output registers are used.

Table 5.7 Output Register Allocation

GL20	GL60S	Output Register No.
4001+n	40001+n	1ST
4002+n	40002+n	2ND
4003+n	40003+n	3RD
4004+n	40004+n	4TH
4005+n	40005+n	5TH
4006+n	40006+n	6TH

 n=1, 2, 3.....
Shows the reference No. at allocation of output registers.

5.4.1 Initial Setting

Initial setting specifies P2823 positioning function. Initial setting is to be made beforehand according to the "initial setting command" of output coil with an initial value set in output register.

(1) Initial Setting Items

B2823 initial setting includes the items listed in Table 5.8.

Table 5.8 Initial Setting Items

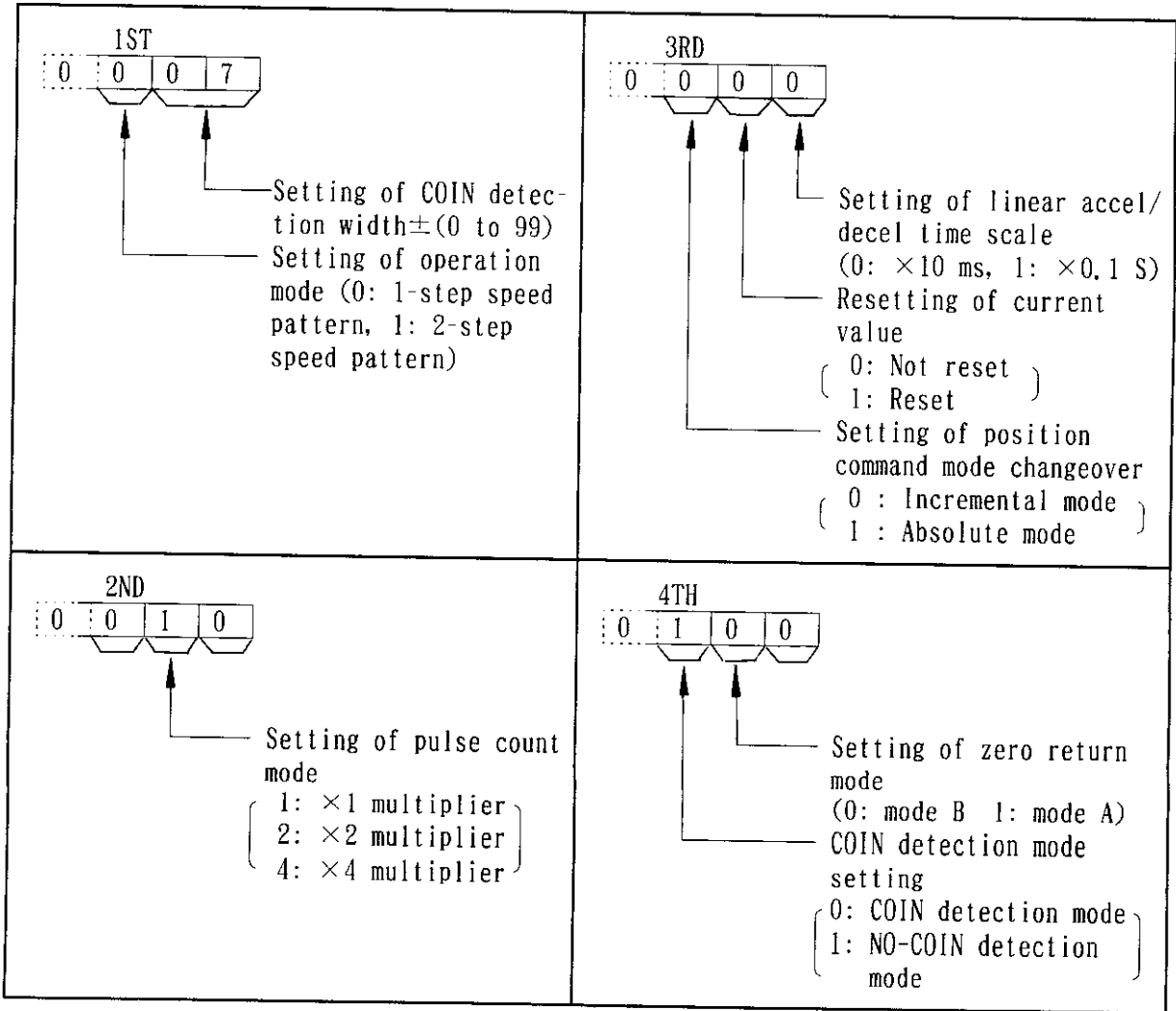
Setting Items	Description
Setting of COIN Detection Width	Specifies COIN detection width. Settable within a range of (± 0 to 99) pulses. COIN detection (deviation of current values of command and feedback) is performed when 0 is specified in COIN detection mode setting.
Setting of Operation Mode	Specifies either 1-step or 2-step speed pattern for automatic positioning operation. 0: 1-step speed pattern 1: 2-step speed pattern
Setting of Pulse Count Mode	Specifies count mode for feedback pulse phase A/B. 1: $\times 1$ multiplier 2: $\times 2$ multiplier 4: $\times 4$ multiplier
Scale Setting for Linear Accel/Decel Time	Specifies scale of linear accel/decel time for various operations. 0 : $\times 10$ ms 1 : $\times 0.1$ s
Resetting of Current Value	Specifies selection of "reset/not reset" of the current value on start of automatic positioning in incremental mode. 0 : Not reset 1 : Reset When selecting 1, automatic positioning always starts at current value 0. Selection is impossible in absolute mode (will cause a setting error.)
Setting of Position Command Mode	Specifies incremental or absolute mode. (Refer to Par. 4.1.) 0 : Selects incremental mode. 1 : Selects absolute mode.
Setting of Zero Return Mode	Specifies zero return mode. (Refer to Par. 4.3.) 0: Mode B 1: Mode A
COIN Detection Mode Setting	Specifies COIN detection mode/NO-COIN detection mode. 0: COIN detection mode Performs deviation calculation of COIN detection. $(\text{Deviation}) = (\text{Current Command Value}) - (\text{Current feedback value})$ <ul style="list-style-type: none"> • $\text{Deviation} \leq \text{COIN detection width}$: "COIN" ON • $\text{Deviation} > \text{COIN detection width}$: "COIN" OFF Conditions for the next operation enable become AND of command pulse distribution completion and "COIN" ON. Input feedback pulse signal. 1: NO-COIN detection mode Does not perform deviation calculation. Input relay "COIN" has been OFF. Conditions for next operation start enable become command pulse distribution completion only. Feedback pulse signal input is not necessary. If feedback pulse signal is input, feedback pulse is counted.

(2) Setting of Initial Value

For initial setting, four sequential output registers are used. Table 5.9 shows the method of setting the initial value in the output register. The framed numerals are default values, which are automatically set upon energization or module resetting.

Table 5.9 Setting of Initial value in Output Register

(GL20 (3 digits) GL60S (4 digits))



(3) Precautions at Initial Setting Process


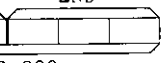
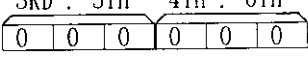
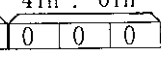
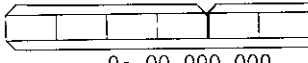
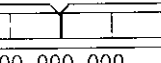
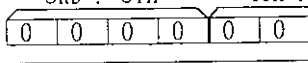
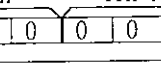
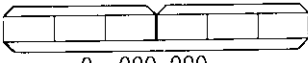
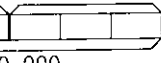
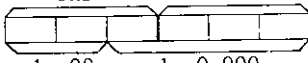
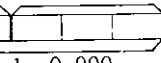
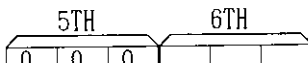
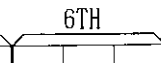
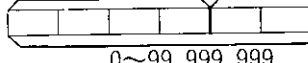
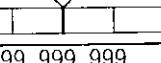
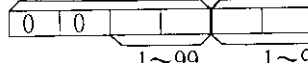

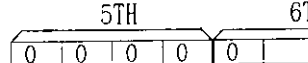
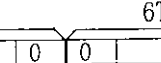
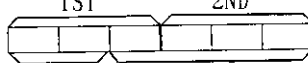
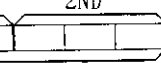
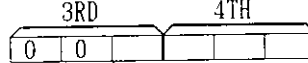
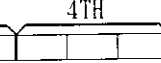
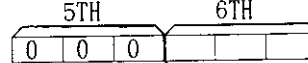
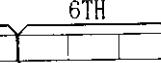
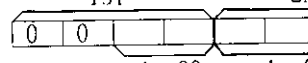
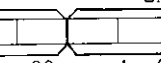
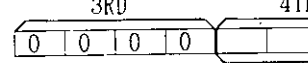
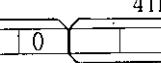
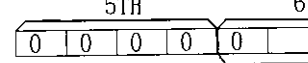
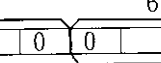
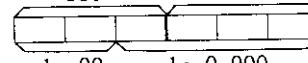
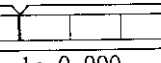
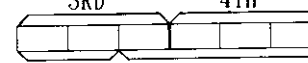
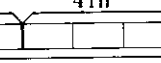
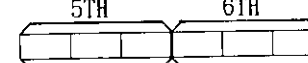
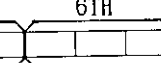
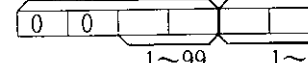
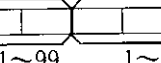
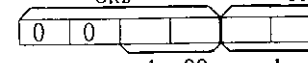
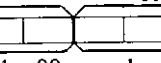
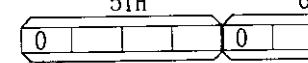
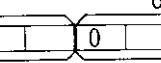
- ① Execution of initial setting clears each set value or current value.
- ② Initial setting checks normal/abnormal value for each set item. If there is an abnormal value, the former set value is provided in the set item. The other items have new set values. Then "PRESET NAK" is turned ON.
- ③ Leave the digits which are not used. Numeral setting is disregarded but displayed on the monitor.

5.4.2 Data Set

(1) Setting Method to Output Register

Table 5.10 shows how to set the data for output register. Sequential six output registers are used.

Table 5.10 Data Set

Setting Items	Output Registers	
	GL20	GL60S
Current Value	1ST  0~999,999 2ND  0~999,999 3RD . 5TH  0 0 0 0 4TH . 6TH  0 0 0 0 Not Used	1ST  0~99,999,999 2ND  0~99,999,999 3RD . 5TH  0 0 0 0 4TH . 6TH  0 0 0 0 Current Value
Auto Positioning: <ul style="list-style-type: none"> Position Command Accel/Decel Time Speed Bias Speed 	1ST  0~999,999 2ND  0~999,999 3RD  1~99 Accel/Decel Time 4TH  1~9,999 Speed Accel/Decel Time, Speed 5TH  0 0 0 0 6TH  0~999 Bias Speed	1ST  0~99,999,999 2ND  0~99,999,999 3RD  0 1 0 1~99 Accel/Decel Time 4TH  1~9,999 Speed Accel/Decel Time, Speed 5TH  0 0 0 0 6TH  0~999 Bias Speed
Zero Return Operation: <ul style="list-style-type: none"> Accel/Decel Time Speed Creep Speed Bias Speed 	1ST  0 0 1~99 Accel/Decel Time 2ND  1~9,999 Speed Accel/Decel Time, Speed 3RD  0 0 1~9,999 Creep Speed 4TH  1~9,999 Creep Speed 5TH  0 0 0 0 6TH  0~999 Bias Speed	1ST  0 0 1~99 Accel/Decel Time 2ND  1~9,999 Speed Accel/Decel Time, Speed 3RD  0 0 1 0 1~9,999 Creep Speed 4TH  1~9,999 Creep Speed 5TH  0 0 0 0 6TH  0~999 Bias Speed
JOG Operation: <ul style="list-style-type: none"> JOGH Accel/Decel Time JOGL Accel/Decel Time JOGH Bias Speed JOGL Bias Speed 	1ST  1~99 Accel/Decel Time 2ND  1~9,999 Speed Accel/Decel Time 3RD  1~99 Accel/Decel Time 4TH  1~9,999 Speed Accel/Decel Time 5TH  0~999 JOGH 6TH  0~999 JOGL Bias Speed	1ST  0 0 1~99 Accel/Decel Time 2ND  1~9,999 Speed Accel/Decel Time 3RD  0 0 1~99 Accel/Decel Time 4TH  1~9,999 Speed Accel/Decel Time 5TH  0 0~999 JOGH 6TH  0 0~999 JOGL Bias Speed

(2) Precautions for Output Register Set Value

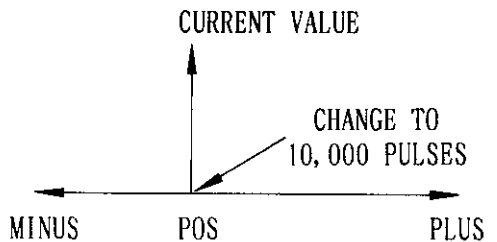
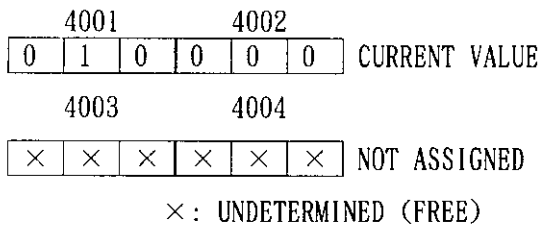
- Speed, bias, speed (pps) setting : A set value \times 100 pps (200pps) \times 10pps/
 \times 20pps is specified by 2SW-3.
- Linear accel/decel time (ms or s) setting : A set value \times 10ms (0.1s) \times 10ms/
 \times 0.1s is specified by initial setting.

(3) Examples of Various Settings --- When output registers 4001 to 4004 are used for GL20.
 When output registers 40001 to 40004 are used for GL60S.

① Setting of current value

Current value is to be updated to 10,000 (pulses).

Set the output registers 4001 through 4006 as follows and turn the "current value change" output coil from OFF to ON. (In this case, the STOP output coil needs to be turned ON.)

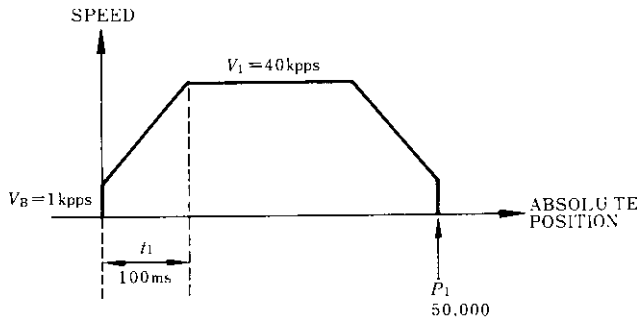


Applicable Contents	GL20	GL60S
Current Value (POS)	4001 4002 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 1 0 0 0 0</div> POS	40001 40002 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 0 0 1 0 0 0 0</div> POS
	4003 4004 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 0 0 0 0 0</div>	40003 40004 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 0 0 0 0 0 0 0</div>
	4005 4006 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 0 0 0 0 0</div>	40005 40006 <div style="border: 1px solid black; display: inline-block; padding: 2px;">0 0 0 0 0 0 0 0</div>

5.4.2 Data Set (Cont'd)

- ② Setting in automatic positioning operation (in case of 1-step speed pattern in absolute mode)

Automatic positioning is to be effected toward the targeted position (50,000th pulse) in a linear accel/decel time of 100 ms, at a steady speed of 40 kpps and bias speed of 1 kpps. Set the output registers 4001 through 4006 as follows and turn the "automatic positioning setting" output coil from OFF to ON.

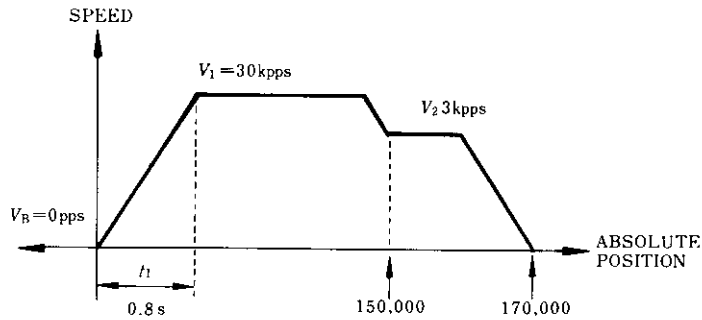


Applicable CPU	GL20	GL60S	Remarks
Position Command Value (P_1)	4001 4002 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 5 0 0 0 0</div> P_1	40001 40002 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 5 0 0 0 0</div> P_1	• $\times 10\text{pps}$, $\times 10\text{ms}$
Linear Accel/Decel Time (t_1) and Speed (V_1)	4003 4004 <div style="border: 1px solid black; padding: 2px; display: inline-block;">1 0 4 0 0 0</div> t_1 V_1	40003 40004 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 1 0 4 0 0 0</div> t_1 V_1	V_1 : $4000 \times 10\text{pps} = 40\text{kpps}$ t_1 : $100 \times 10\text{ms} = 100\text{ms}$
Bias Speed (V_B)	4005 4006 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 1 0 0</div> V_B	40005 40006 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 0 0 1 0 0</div> V_B	V_B : $100 \times 10\text{pps} = 1\text{kpps}$

③ Setting in automatic positioning operation (in case of 2-step speed pattern in absolute mode)

Automatic positioning is to be effected toward the targeted position (150,000th pulse) in acceleration time of 0.8 sec and at a steady speed of 30 kpps and bias speed of 0pps and from there to the final position 170,000th pulse at decelerated steady speed of 3 kpps.

Set the following values to output registers 4001 to 4006 in the scan in which output coil "AUTO POSITIONING SETTING" is turned ON.



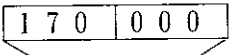
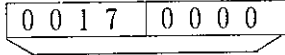
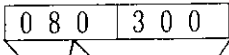
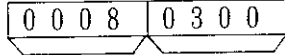
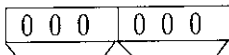
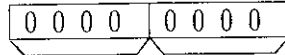
At 1st-Step Speed

Applicable CPU Contents	GL20	GL60S	Remarks
Position Command Value (P_1)	4001 4002 <div style="border: 1px solid black; padding: 2px; display: inline-block;">1 5 0 0 0 0</div> P_1	40001 40002 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 1 5 0 0 0 0</div> P_1	• $\times 10\text{pps}$, $\times 10\text{ms}$
Linear Accel/Decel Time (t_1) Speed (V_1)	4003 4004 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 8 3 0 0 0</div> t_1 V_1	40003 40004 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 8 3 0 0 0</div> t_1 V_1	$V_1: 3000 \times 10\text{pps} = 30\text{kpps}$ $t_1: 8 \times 0.1\text{s} = 0.8\text{s}$
Bias Speed (V_B)	4005 4006 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 0 0 0</div> V_B	40005 40006 <div style="border: 1px solid black; padding: 2px; display: inline-block;">0 0 0 0 0 0 0 0</div> V_B	$V_B: 0 \times 10\text{pps} = 0\text{pps}$

5.4.2 Data Set (Cont'd)

For the next scan, set the output registers 4001 through 4006 as shown below. The "positioning setting" output coil must be turned ON up to this scan. In other words, the output coil must be turned ON for only two scans.

At 2nd-Step Speed

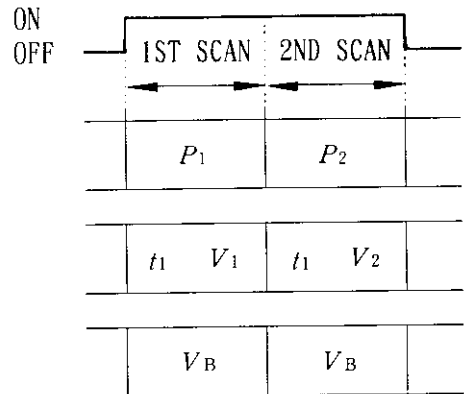
Applicable CPU Contents	GL20	GL60S	Remarks
Position Command Value (P_2)	4001 4002  P_1	40001 40002  P_1	<ul style="list-style-type: none"> • $\times 10\text{pps}$, $\times 10\text{ms}$
Linear Accel/Decel Time (t_1) Speed (V_2)	4003 4004  t_1 V_2	40003 40004  t_1 V_2	$V_2: 3000 \times 10\text{pps} = 30\text{kpps}$ $t_1: 8 \times 0.1\text{s} = 0.8\text{s}$
Bias Speed (V_B)	4005 4006  V_B	40005 40006  V_B	$V_B: 0 \times 10\text{pps} = 0\text{pps}$

The above explanation can be seen in the timing chart below.

"Automatic positioning setting" output coil

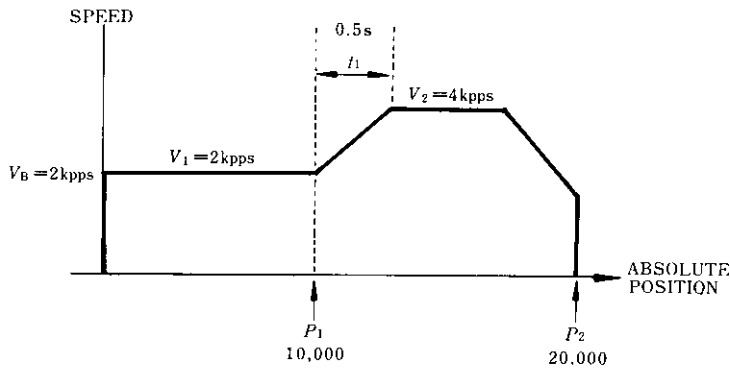
Output registers {

- 1st, 2nd registers (for position)
- 3rd, 4th registers (for accel/decel time and speed)
- 5th, 6th registers (for bias speed)



Note: Set the accel/decel time for the second scan the same as for the first scan.

- Operation is performed at bias speed and steady speed of 2kpps toward 10,000th pulse. From 10,000th pulse, the operation is performed at linear accel/decel time of 0.5 s and steady speed of 4kpps for the final positioning at 20,000th pulse.



At 1st-Step Speed

Applicable CPU Contents	GL20	GL60S	Remarks
Position Command Value (P_2)	4001 4002 0 1 0 0 0 0 P_1	40001 40002 0 0 1 0 0 0 0 0 P_1	• $\times 10\text{pps}$, 0.1s
Linear Accel/Decel Time (t_1) Speed (V_2)	4003 4004 0 5 0 2 0 0 t_1 V_1	40003 40004 0 0 0 5 0 2 0 0 t_1 V_1	$V_1: 200 \times 10\text{pps} = 2\text{kpps}$ $t_1: 5 \times 0.1\text{s} = 0.5\text{s}$
Bias Speed (V_B)	4005 4006 0 0 0 2 0 0 V_B	40005 40006 0 0 0 0 0 2 0 0 V_B	$V_B: 200 \times 10\text{pps} = 2\text{kpps}$

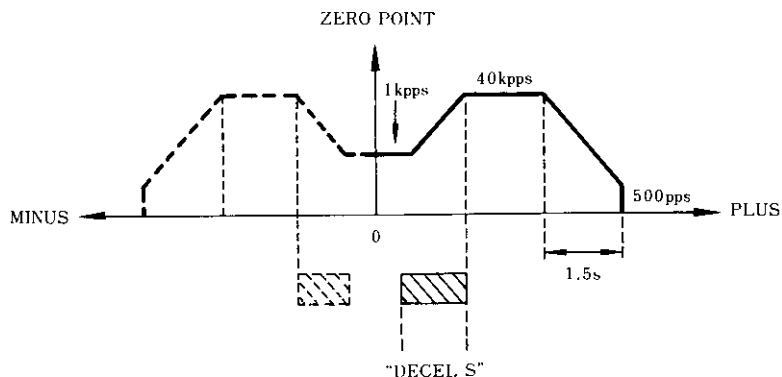
At 2nd-Step Speed

Applicable CPU Contents	GL20	GL60S	Remarks
Position Command Value (P_2)	4001 4002 0 2 0 0 0 0 P_1	40001 40002 0 0 0 2 0 0 0 0 P_1	
Linear Accel/Decel Time (t_1) Speed (V_2)	4003 4004 0 5 0 4 0 0 t_1 V_2	40003 40004 0 0 0 5 0 4 0 0 t_1 V_2	$V_2: 400 \times 10\text{pps} = 4\text{kpps}$ $t_1: 5 \times 0.1\text{s} = 0.5\text{s}$
Bias Speed (V_B)	4005 4006 0 0 0 2 0 0 V_B	40005 40006 0 0 0 0 0 2 0 0 V_B	$V_B: 200 \times 10\text{pps} = 2\text{kpps}$

5.4.2 Data Set (Cont'd)

④ Setting of zero return operation (in mode B)

Set the accel/decel time at 1.5 seconds, steady speed at 40 kpps, creep speed at 1 kpps and bias speed at 500 pps. Set the output registers 4001 through 4006 as shown below and turn the "zero return setting" output coil from OFF to ON. (At this time, the AUTO/MAN output coil and STOP output coil need to be at OFF and ON, respectively.)



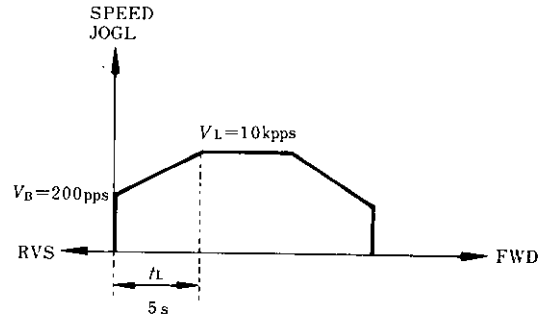
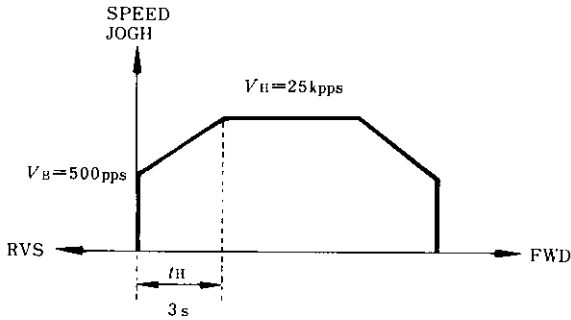
Applicable CPU	GL20	GL60S	Remarks														
Contents																	
Linear Accel/Decel Time (t_1) Speed (V_2)	4001 4002 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>1</td><td>5</td><td>4</td><td>0</td><td>0</td><td>0</td></tr> </table> t V_1	1	5	4	0	0	0	40001 40002 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0</td><td>0</td><td>1</td><td>5</td><td>4</td><td>0</td><td>0</td><td>0</td></tr> </table> t V_1	0	0	1	5	4	0	0	0	• $\times 10\text{pps}$, $\times 10\text{ms}$
1	5	4	0	0	0												
0	0	1	5	4	0	0	0										
Creep Speed (V_C)	4003 4004 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> </table> V_C	0	0	0	1	0	0	40003 40004 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td></tr> </table> V_C	0	0	0	0	0	1	0	0	$V_1: 4000 \times 10\text{pps} = 40\text{kpps}$ $t: 15 \times 0.1\text{s} = 1.5\text{s}$
0	0	0	1	0	0												
0	0	0	0	0	1	0	0										
Bias Speed (V_B)	4005 4006 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>5</td><td>0</td></tr> </table> V_B	0	0	0	0	5	0	40005 40006 <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>5</td><td>0</td></tr> </table> V_B	0	0	0	0	0	0	5	0	$V_B: 50 \times 10\text{pps} = 500\text{pps}$
0	0	0	0	5	0												
0	0	0	0	0	0	5	0										

⑤ Setting of JOG operation

Set JOGH linear accel/decel time at 3 seconds, steady speed at 25 kpps, and bias speed at 500 pps.

Set JOGL linear accel/decel time at 5 seconds, steady speed at 10 kpps, and bias speed at 200 pps.

Set the output registers 4001 through 4006 as shown below and turn the "jog setting" coil from OFF to ON. (At this time, the AUTO/MAN output coil and STOP output coil need to be at OFF and ON, respectively.)



Applicable CPU Contents	GL20	GL60S	Remarks
JOGH Linear Accel/ Decel Time (t_H) Speed (V_H)	4001 4002 3 0 2 5 0 0 t_H V_H	40001 40002 0 0 3 0 2 5 0 0 t_H V_H	• $\times 10\text{pps}$, $\times 10\text{ms}$ $V_H: 2500 \times 10\text{pps} = 25\text{kpps}$ $t_H: 30 \times 0.1\text{s} = 3\text{s}$ $V_L: 1000 \times 10\text{pps} = 10\text{kpps}$ $t_L: 50 \times 0.1\text{s} = 5\text{s}$ $V_{BH}: 50 \times 10\text{pps} = 500\text{pps}$ $V_{BL}: 20 \times 10\text{pps} = 200\text{pps}$
JOGL Linear Accel/ Decel Time (t_L) Speed (V_L)	4003 4004 5 0 1 0 0 0 t_L V_L	40003 40004 0 0 5 0 1 0 0 0 t_L V_L	
JOGH Bias Speed (V_{BH}) JOGL Bias Speed (V_{BL})	4005 4006 0 5 0 0 2 0 V_{BH} V_{BL}	40005 40006 0 0 5 0 0 0 2 0 V_{BH} V_{BL}	

5.5 INPUT REGISTER (MONITOR DATA) FROM B2823 TO CPU MODULE

To monitor various data in B2823 from the CPU module, six consecutive input registers are used. The contents of monitor data are varied depending on specification of monitor code (output coil: monitors 1 through 3).

Table 5.11 Input Register Allocation

GL20	G060S	Input Register No.
3001 + n	30001 + n	1ST
3002 + n	30002 + n	2ND
3003 + n	30003 + n	3RD
3004 + n	30004 + n	4TH
3005 + n	30005 + n	5TH
3006 + n	30006 + n	6TH

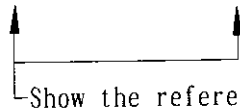

 $n=0, 1, 2 \dots\dots$
 Show the reference No. at allocation of input registers.

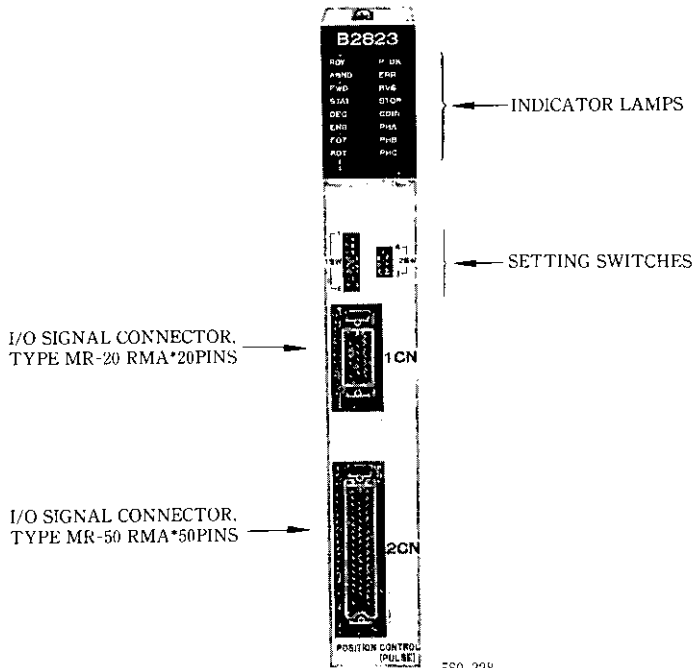
Table 5.12 Monitoring Contents of Monitor Code Input Registers

Monitor Code Output Coil			Monitoring Contents					
Monitor 1	Monitor 2	Monitor 1	Input Registers 1ST, 2ND		Input Registers 3RD, 4TH		Input Registers 5TH, 6TH	
			GL20	GL60S	GL20	GL60	GL20	GL60S
0	0	0	Current Value (PG Feedback)		Command Current Value		Command Current Value	
			1ST 0-999,999	2ND 0-99,999,999	3RD 0-999,999	4TH 0-99,999,999	5TH 0-999,999	6TH 0-99,999,999
1	0	0	Error Code		Error Code		Error Code	
			1ST 0-9	2ND 0-99	3RD 0-9	4TH 0-99	5TH 0-9	6TH 0-99
0	1	0	Current Value Setting		Current Value Setting		Current Value Setting	
			1ST 0-999,999	2ND 0-99,999,999	3RD 0-999,999	4TH 0-99,999,999	5TH 0-999,999	6TH 0-99,999,999
1	1	0	Special Positioning Setting : No. of Pulses Output		Special Positioning Setting : Accel/Decel Time and Speed		Special Positioning Setting : Accel/Decel Time and Speed	
			1ST 0-999,999	2ND 0-99,999,999	3RD 1-99	4TH 1-9,999	5TH 1-99	6TH 1-9,999
0	0	1	Auto Positioning Setting: Position Command		Auto Positioning Setting : Accel/Decel Time and Speed		Bias Speed	
			1ST 0-999,999	2ND 0-99,999,999	3RD 1-99	4TH 1-9,999	5TH 0-999	6TH 0-999
1	0	1	JOG Setting : JOGH Accel/Decel Time and Speed		JOG Setting : JOGH Accel/Decel Time and Speed		Bias Speed	
			1ST 1-99	2ND 1-9,999	3RD 1-99	4TH 1-9,999	5TH 0-999	6TH 0-999
0	1	1	Zero Return Setting : Accel/Decel Time and Speed		Zero Return Setting : Creep Speed		Bias Speed	
			1ST 1-99	2ND 1-9,999	3RD Not Used	4TH 1-9,999	5TH 0-999	6TH 0-999
1	1	1	Initial Setting (same as that of output register) See Table 5.9.					
			5TH	6TH	5TH	6TH	5TH	6TH

Note : The number of errors covers those classified according to error codes.
 Even if multiple errors of the same error code occur, they are counted as 1.
 As an error code, the smallest error code of those which occurred is indicated.

6.EXTERNAL INTERFACE

6.1 FRONT PANEL



* Made by Honda Tsushin Co., Ltd.

6.2 CONNECTOR TERMINAL LAYOUT

(1) Connector (1CN) Terminal Layout

Table 6.1 Connector 1CN Terminal Layout for I/O Signals

1	2	3	4	5	6	7
0V	0V	0V	+ 5V	+ 5V	+ 5V	+12V
Encoder PG 0V			Encoder PG + 5V			Power Supply Output for Encoder PG +12V
8	9	10	11	12	13	
		+ TG	- TG	+12V	+12V	
TG Signal Junction Input			Power Supply Output for Encoder PG +12V			
14	15	16	17	18	19	20
PC	* PC	PA	* PA	PB	* PB	FG
PG Signal Input Phase C		PG Signal Input Phase A		PG Signal Input Phase B		Frame Ground- ing

(2) Connector (2CN) Terminal Layout

Table 6.2 Connector 2CN Terminal for I/O Signals

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
12/24V	STOP	START	0V	0V	0V	0V	0V	0V	0V	0V	0V	-TG	+TG	FG	FG	FG	FG
Input Signal Power	External Stop Input	External Start Input	Fault Output 0V	Coin Clear Output 0V	Reference Pulse Output 0V		External Pulse Generator Power Supply 0V	External Power Supply 0V			TG Signal Junction Output		Frame Grounding				
		19	20	21	22	23	24	25	26	27	28	29	30	31	32		
		EXEN	SVOK	ROT	FOT		+5V	+5V	+5V	+12V	+12V	+12V					
		Pulse Input Enable (Manually)	Servo Normal Input	Reverse Over LS Input	Forward Over LS Input		Ext. Pulse Generator Power Supply +5V			Ext. Pulse Generator Power Supply +12V							
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
12/24V	SPLS	DEC	FAULT	COIN	CLR	SIGN	PULSE	CCW	CW	PBI	PAI	+12V	+12V	+12V	+5V	+5V	+5V
Input Signal Power	Special LS Input	Decel LS Input	Fault Output	Coin Output	Clear Output	Ref. Sign Output(12V)	Signal Pulse Output (12V)	FWD Ref Pulse Output	RVS Ref Pulse Output	Ext. Pulse Input Phase B	Ext. Pulse Input Phase A	+12V External Power Supply			+5V External Power Supply		

(3) Specifications of Applicable Receptacles for 1CN, 2CN

Table 6.3 Specifications of Applicable Receptacles for I/O Signals

Connector Type Used in B2803	Applicable Receptacle Specifications			Manufacturer
	Soldered Type	Caulking Type	Case	
1CN MR-20RMA, Right Angle 20P	MR-20F *	MRP-20F01	MR-20L *	Honda Tsushin Co., Ltd.
2CN MR-50RMA, Right Angle 50P	MR-50F *	MRP-50F01	MR-50L *	

* Standard attachment to B2823

6.3 1CN/2CN I/O SIGNALS

(1) 1CN I/O Signals

Table 6.4 1CN Input Signals

Signal Name	1CN Pin No.	Contents												
PA * PA	16 17	PG feedback pulse input terminal (1) Input circuit												
PB * PB	18 19													
PC * PC	14 15													
			(2) PG output form											
			<ul style="list-style-type: none"> • Line driver (5V) : 1SW-1,2,3 OFF 1SW-4,5,6 ON • Emitter follower (12V) : 1SW-1,2,3 ON 1SW-4,5,6 OFF 											
			<ul style="list-style-type: none"> • "H" level: +10V to +12V • "L" level: 0V to +1.2V 											
		(3) Input level (in emitter follower)												
		(4) Max count frequency												
		(5) Pulse count timing												
		<table border="1"> <thead> <tr> <th>Count</th> <th>Addition</th> <th>Subtraction</th> </tr> </thead> <tbody> <tr> <td>1-multiplier</td> <td></td> <td></td> </tr> <tr> <td>2-multiplier</td> <td></td> <td></td> </tr> <tr> <td>4-multiplier</td> <td></td> <td></td> </tr> </tbody> </table>	Count	Addition	Subtraction	1-multiplier			2-multiplier			4-multiplier		
Count	Addition	Subtraction												
1-multiplier														
2-multiplier														
4-multiplier														
+TG -TG	10 11	TG pulse junction input terminal 												

Note : Feedback pulse signal connection

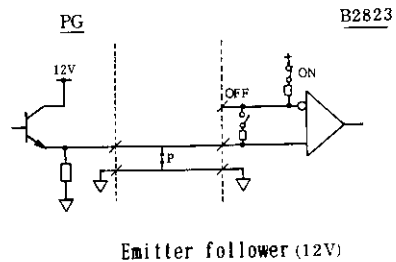
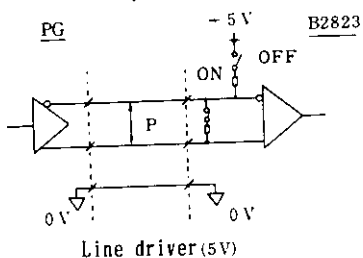


Table 6.5 1CN Output Signals

Signal Name	1CN Pin No.	Contents
+12V	7, 12, 13	<ul style="list-style-type: none"> • Power supply output terminal for encoder PG • +12V power supply output • Max. output current : 200 mA
+5V	4, 5, 6	<ul style="list-style-type: none"> • +5V power supply output • Max. output current: 200 mA
0V	1, 2, 3	<ul style="list-style-type: none"> • 0V of +12/+5V power supply output [External power supply (connected to 2CN) is output.]

(2) 2CN I/O Signals

Table 6.6 2CN Input Signals

Signal Name	1CN Pin No.	Contents
$\overline{\text{START}}$ (Ext. Start)	3	Inputs external start command. Provides the same function as of the output coil START and composes OR in B2823. Effective at ON.
$\overline{\text{STOP}}$ (Ext. Stop)	2	Inputs external stop command. Provides the same function as of the output coil STOP and composes OR in B2823. Effective at ON.
$\overline{\text{SVOK}}$ (Servo Normal)	20	Makes L level connection when the servo system is normal.
$\overline{\text{EXEN}}$ (Ext. Pulse Input Enable)	19	Enables pulse input from the manual pulse generator at L level.
$\overline{\text{DEC}}$ (Decel LS)	35	Makes L level connection when the deceleration limit switch is at ON. Input signal required for zero return.

(1) Input circuit

(2) Input current
 About 10 mA (24 V)
 About 5 mA (12 V)

6.3 1CN/2CN I/O SIGNALS (Cont'd)

Table 6.6 2CN Input Signals (Cont'd)

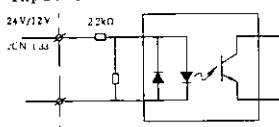
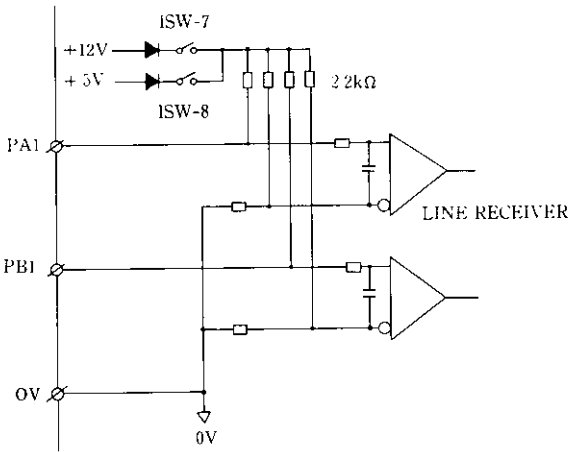
Signal Name	2CN Pin No.	Contents										
\overline{FOT} (Forward Over LS)	22	Makes L-level connection when the forward over LS is at ON. Then, stops pulse distribution.	(1) Input circuit 									
\overline{ROT} (Reverse Over LS)	21	Makes L-level connection when the reverse over LS is at ON. Then, stops pulse distribution.	<ul style="list-style-type: none"> • When \overline{FOT} is ON. Zero return and JOG operations are available in reverse direction. • When \overline{ROT} is ON. Zero return and JOG operations are available in forward direction. (2) Input current About 10mA (24V) About 5mA (12V)									
12 / 24 V	1, 33	External power supply for 2CN-2, -3, -19, -20, -22, -35. Prepare 12 or 24 VDC power supply.										
+12 V +5 V 0 V	45, 46, 47 48, 49, 50 10, 11, 12	+12 and +5 V external power supply inputs +5V DC $\pm 5\%$ 0.8A +12V DC $\pm 5\%$ 0.3A (1.6A protective fuse built in)										
PA1(Phase A) PBI(Phase B) 0 V	44 43 8, 9	External pulse input from manual pulse generator	(1) Input circuit  (2) Input voltage and current <ul style="list-style-type: none"> • 12V system H level: 10 to 12V (ISW-7 ON) L level: 0 to 1.2V (ISW-8 OFF) Input current: 5.5 mA (current flowing through input terminal with input at 0V) • 5V system H level: 3.5 to 5V (ISW-7 OFF) L level: 0 to 1.2V (ISW-8 ON) Input current: 2.3 mA (current flowing through input terminal with input at 0V) (3) PG output form <ul style="list-style-type: none"> • Open collector • Pull-up type collector output (selection with +12V/+5V switch) (4) Max. count frequency 100kpps (5) Pulse count timing A/B phase 1 × frequency alone <table border="1" data-bbox="822 1869 1208 1963"> <thead> <tr> <th></th> <th>Addition</th> <th>Subtraction</th> </tr> </thead> <tbody> <tr> <td>PA1</td> <td></td> <td></td> </tr> <tr> <td>PBI</td> <td></td> <td></td> </tr> </tbody> </table>		Addition	Subtraction	PA1			PBI		
	Addition	Subtraction										
PA1												
PBI												

Table 6.7 2CN Output Signals

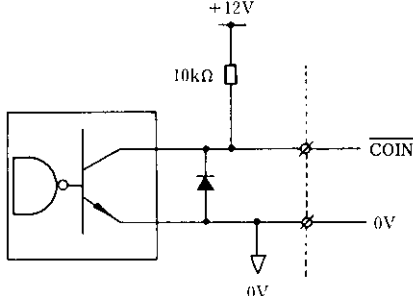
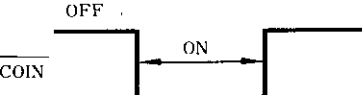
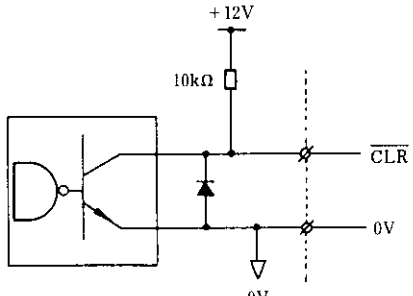
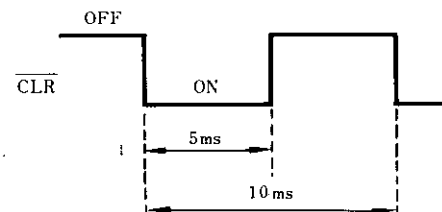
Signal Name	2CN Pin No.	Contents
PULSE SIGN 0V	40 39 6.7	<p>Reference pulse output signal for sign + pulse. 12 V output available (line driver)</p> <p>(1) Output circuit • 12 V output</p> <p>(2) Output voltage/current • 12 V Output Load voltage : 12 V Load current : 100 mA max. Output voltage at ON: 0.7 V or more</p> <p>(3) Max. output frequency • 100 kpps or 200 kpps (Switch selection)</p> <p>(4) Output wave form • Duty : 50%</p>
$\overline{\text{CCW}}$ (FWD) $\overline{\text{CW}}$ (RVS)	41 42	<p>Reference pulse output signal for forward run pulse + reverse run pulse</p> <p>(1) Output circuit</p>

6.3 1CN/2CN I/O SIGNALS (Cont'd)

Table 6.7 2CN Output Signals (Cont'd)

Signal Name	2CN Pin No.	Contents	
OV	6, 7	<p>(2) Output voltage/current Load voltage : 12 V Load current : 100 mA max. Output voltage at transistor ON: 0.7 V or more</p> <p>(3) Max. output frequency • 100kpps or 200kpps (Switch selection)</p> <p>(4) Output wave form • Duty : 50%</p>	
+12 V 0 V	27, 28, 29 8, 9	+12 V power supply for manual pulse generator Max output current : 200 mA	
+5 V 0 V	24, 25, 26 8, 9	+5 V power supply for manual pulse generator Max output current : 200 mA (External power supply is output.)	
+TG -TG	14 13	TG signal junction output (Refer to the explanation of 1CN -10,11.)	
FAULT (Fault Output) OV (Fault Output 0 V)	36 4	<p>Normally at L level. H level reached under the following conditions:</p> <ul style="list-style-type: none"> • Hardware error is detected during self-diagnosis. • External input signal SVOK is turned to H level. • External power supply is fault. • B2823 deviation counter is overshoot. <p>(Feedback malfunctioning : overflow at FFFF(H))</p>	<p>(1) Output circuit</p> <p>(2) Output voltage/current Load voltage : 12 V Load current : 100 mA max. Output voltage at transistor ON : 0.7 V or less</p> <p>(3) Output waveform</p>

Table 6.7 2CN Output Signals (Cont'd)

Signal Name	2CN Pin No.	Contents
$\overline{\text{COIN}}$ (Coin Output) 0 V (Coin Output 0 V)	37 5	Turns to L level when the number of lag pulses on the deviation counter enters the set range of COIN detection width.
		(1) Output circuit  (2) Output voltage/current Load voltage : 12 V Load current : 100 mA max. Output voltage at transistor ON : 0.7 V or less
		(3) Output waveform 
$\overline{\text{CLR}}$ (Clear Output) 0 V (Clear Output 0 V)	38 5	Output signal for clearing the deviation counter. Turns to L level under the conditions below. <ul style="list-style-type: none"> • Upon turning on external power supply • Upon turning on internal power supply • Upon resetting module • Upon completion of zero return • On occurrence of hardware error • When FOT or ROT is ON.
		(1) Output circuit  (2) Output voltage/current Load voltage : 12 V Load current : 100 mA max. Output voltage at transistor ON : 0.7 V or less
		(3) Output waveform  Note: Under hardware error, ON/OFF output is continuously performed.

6.4 LED INDICATOR LAMP

Table 6.8 LED Indicator Lamps

Name	Color	Description
RDY	R	Indicates the self-diagnosis result of module. Linked with input relay READAY.
P. OK	R	Lit when external power supply input (+5 V, +12 V) is normal.
ABNO	R	Lit when FAULT signal is output. Linked with input relay FAULT.
ERR	R	Lit when the module detects any error. Linked with input relay ERROR.
FWD	R	Lit while forward run command is output.
RVS	R	Lit while reverse run command is output.
STAT	R	Lit when external input signal START is at L level.
STOP	R	Lit when external input signal STOP is at L level.
DEC	R	Lit when external input signal DEC is at L level. Linked with input relay DECEL LS.
ENB	R	Lit when B2823 is ready to input external pulse from the manual pulse generator.
COIN	R	Lit while COIN signal is distributed. Linked with input relay COIN.
PHA	R	Lit when PA (phase A) signal is input.
PHB	R	Lit when PB (phase B) signal is input.
PHC	R	Lit when PC (phase C) signal is input.
FOT	R	Lit when FOT is at L level. Linked with input relay FWD OVER LS.
FOT	R	Lit when ROT is at L level. Linked with input relay RVS OVER LS.

6.5 SWITCH SET

(1) 1 SW Setting

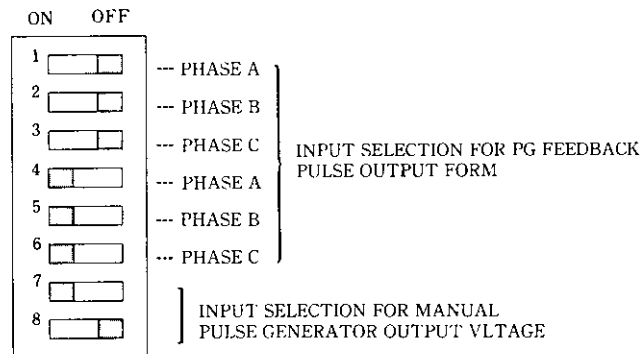


Fig 6.1 1SW

Table 6.9 PG Output Form Selection

	Phase A		Phase B		Phase C	
	1SW-1	1SW-4	1SW-2	1SW-5	1SW-3	1SW-6
+12 V Emitter Follower	ON	OFF	ON	OFF	ON	OFF
+5 V Line Driver	OFF	ON	OFF	ON	OFF	ON

Note: Turn ON one of the switch pairs below and turn off the other.

Switch combinations: 1SW-1 and 1SW-4, 1SW-2 and 1SW-5, and 1SW-3 and 1SW-6.

Table 6.10 Manual Pulse Output Voltage Selection

	1SW-7	1SW-8
+12 V	ON	OFF
+5 V	OFF	ON

Note: Be sure to set either one of 1SW-7 or 1SW-8 to ON.

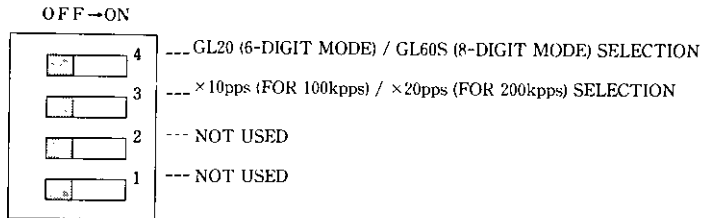


Fig. 6.2 2 SW

(2) 2SW Setting

The contents of 2SW setting is preset in B2823 when turning on power supply or resetting the module.

Table 6.11 2 SW Setting

2SW	OFF	ON
2SW-4	GL 20 (6-digit mode)	GL 60 (8-digit mode)
2SW-3	×10pps(For 100kpps)	×20pps(For 200kpps)
2SW-2	Not used	Not used
2SW-1	Not used	Not used

(3) Factory Setting

1SW	
1SW-1	OFF
1SW-2	OFF
1SW-3	OFF
1SW-4	ON
1SW-5	ON
1SW-6	ON
1SW-7	ON
1SW-8	OFF

2SW	
2SW-4	OFF
2SW-3	OFF
2SW-2	OFF
2SW-1	OFF

7. TEST OPERATION ADJUSTMENT

7.1 CHECKS BEFORE TEST OPERATION

Before turning on the power supply, carefully check the wiring.

- (1) Incorrect connection of the power supply (± 12 V, +5 V) to the B2823 may burn out or damage electrical parts in the B2813.
- (2) If the wires are connected in reverse polarity to the motor, TG, and PG, the motor runs out of control. Make sure that the feedback loops for TG and PG are constructed in the negative feedback mode.
- (3) To avoid unexpected mishaps, where the test operation must be started with the motor coupled to the driven machine, start the motor after preparing for an immediate emergency stop.

7.2 TURNING ON POWER SUPPLY

- (1) After B2823 setting and the wiring check have been completed, turn on the power supply. The following LEDs light to indicate the correctly energized state.
 - Servopack : P for control, MP for main circuit
 - B2823 : P. OK
- (2) Run the motor by giving reference pulses of a low frequency.
 - When FB pulses phases A and B are input correctly, PHA PHB blinks, respectively.
 - With the reference for forward running, the motor runs CCW when viewed from the load side.

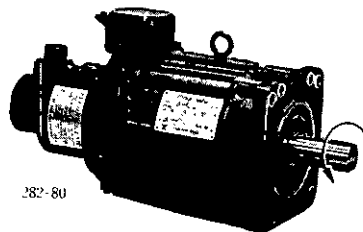


Fig 7.1 Direction of Motor Rotation at Forward Running Command

- Check that the motor stops when the reference pulse is discontinued.

8. CONNECTION

8.1 TYPICAL INTERCONNECTION DIAGRAM

(1) When Used with Servopack Type CACR-PR000 BB300 (Positioning Control)

200 TO 230VAC + 10% / -15%
(50/60Hz)

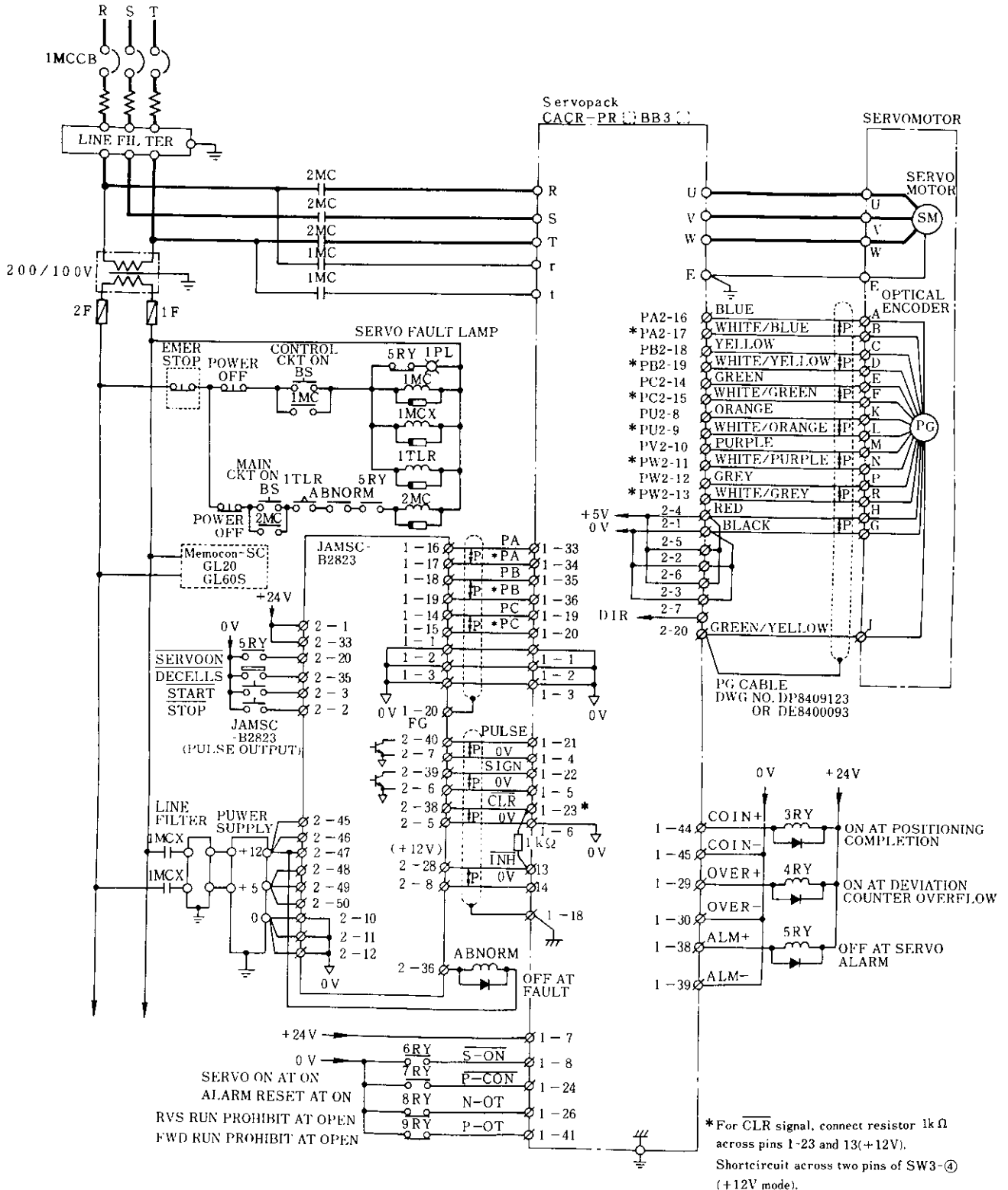


Fig. 8.1 Typical Interconnection Diagram (1)

(2) When Used with Servopack Type CACR-PR-1100 BC300 (Positioning Control)

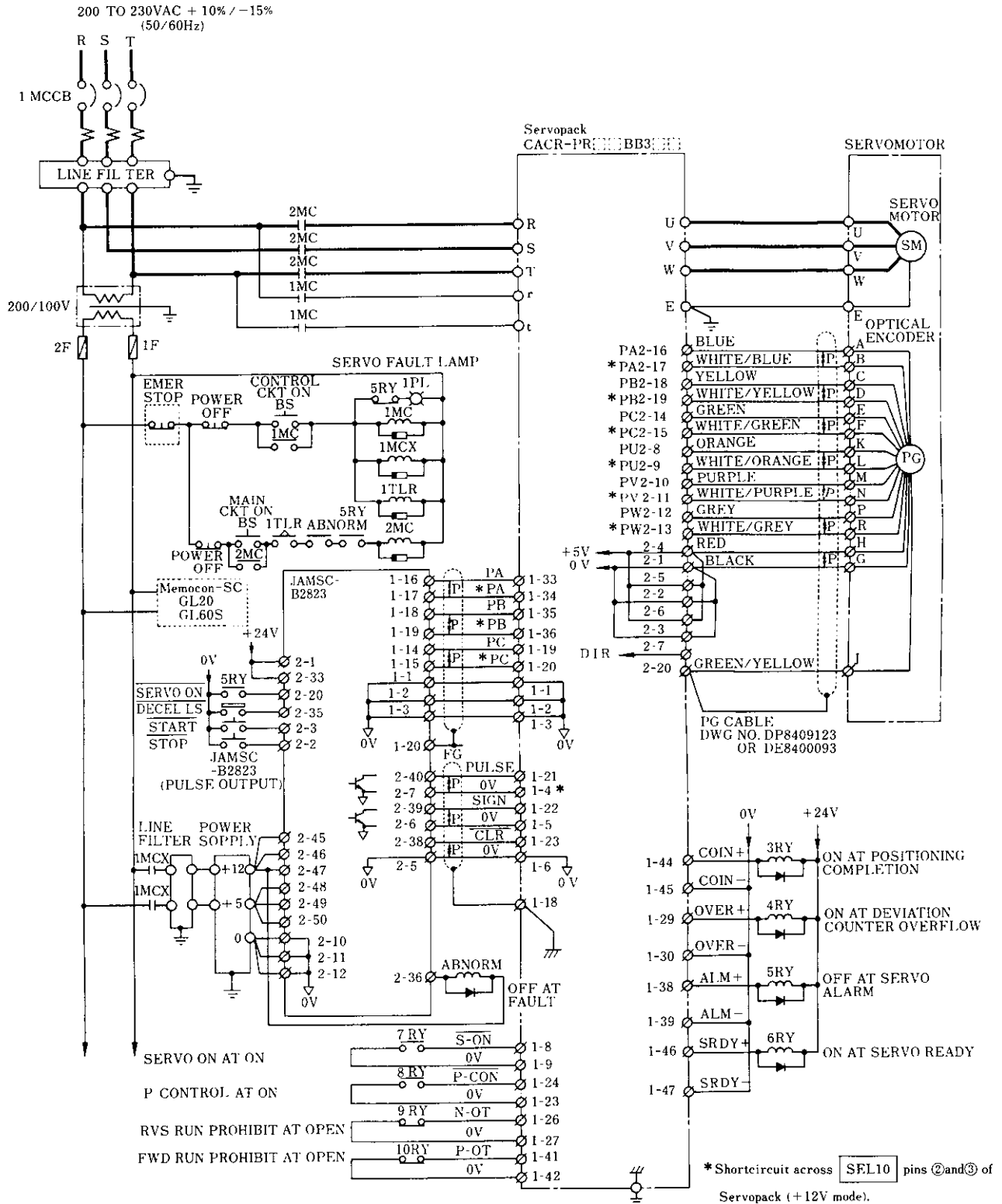


Fig. 8.2 Typical Interconnection Diagram (2)

(3) When Used with Servopack Type CACR-PR AC SERVO (Positioning Control)

200 TO 230VAC + 10% / -15%
(50/60Hz)

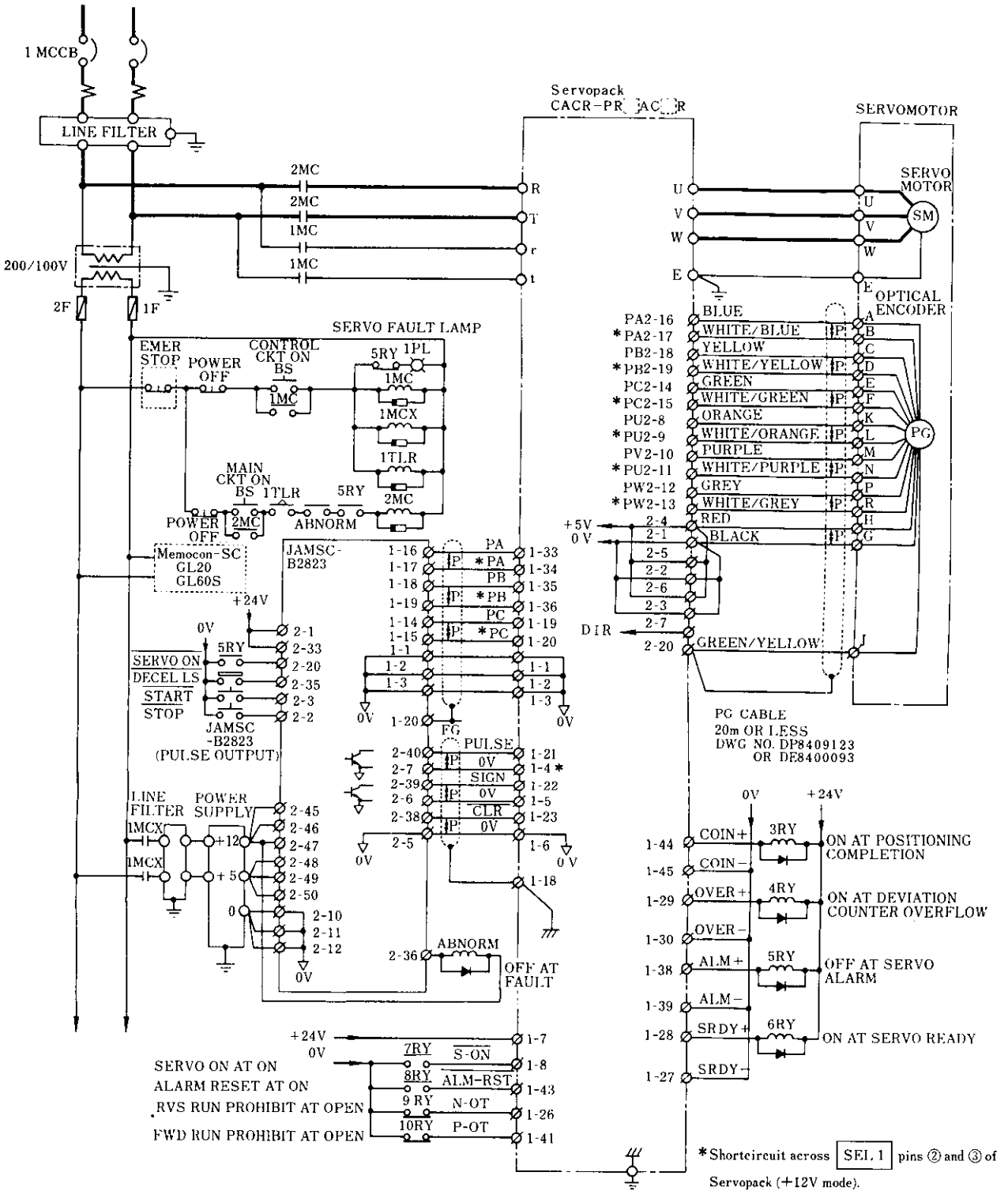


Fig. 8.3 Typical Interconnection Diagram (3)

8.1 TYPICAL INTERCONNECTION DIAGRAM(Cont'd)

(4) Connection Example with Oriental Step Pulse Motor UPD Type

Note: This diagram shows the minimum needed connections for pulse motor drive. Follow UPD instructions carefully when operating the drive.

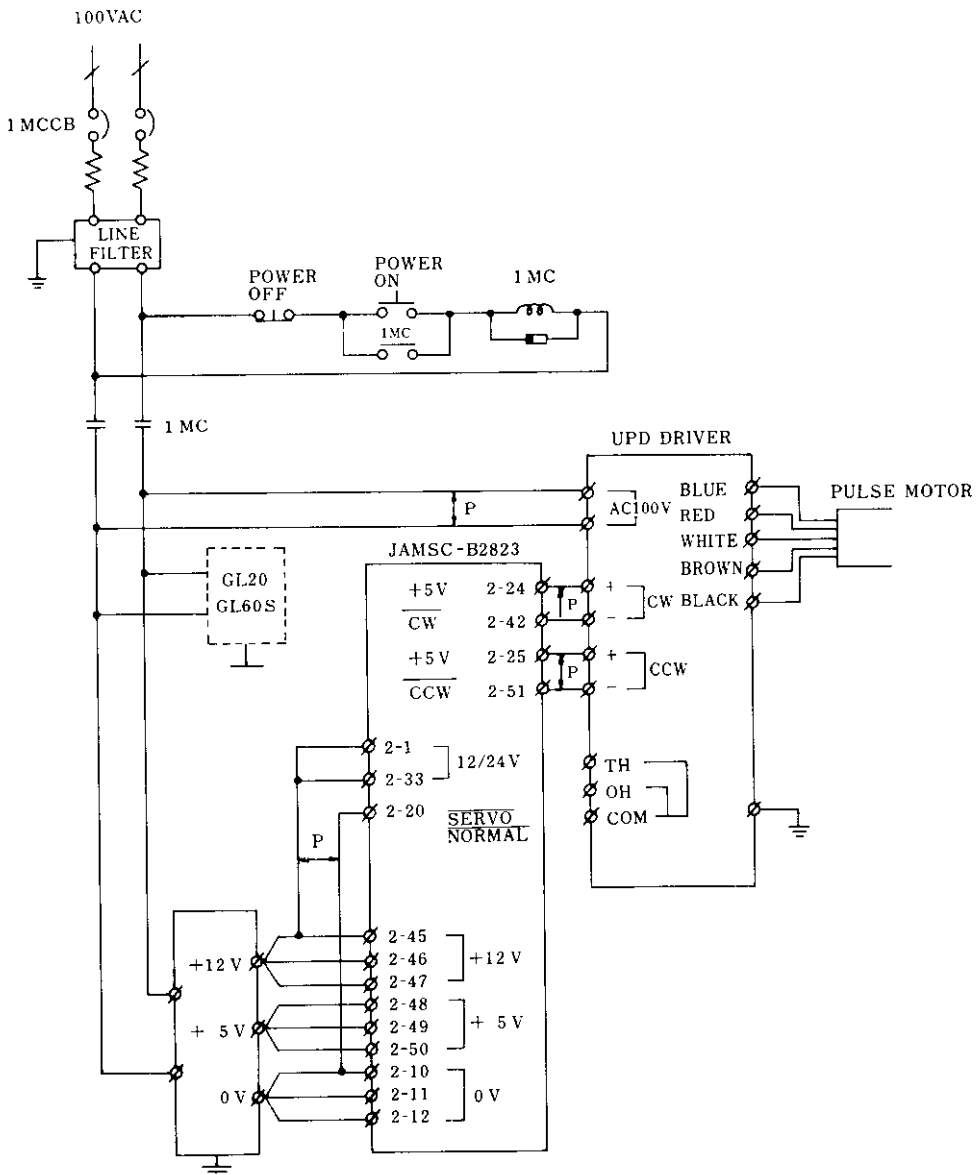


Fig. 8.4 Typical Interconnection Diagram (4)

8.2 EXTERNAL I/O SIGNALS OF B2823

- (1) All the external I/O signals do not always need to be connected. I/O signals unused in the system may be left open. However, use of SERVO NORMAL input signal is mandatory. Whenever the SERVO NORMAL input signal is open, B2823 remains inactive. Zero return is possible in either mode A nor B when DECEL LS input signal is open. When input signal FWD OVER LS or RVS OVER LS is open, monitoring overlimit is not performed.
- (2) After turning on the internal power supply or resetting the module, B2823 waits until FAULT output is turned on (normally) once and SERVO NORMAL input is turned on. B2823 does not distribute pulse reference.

8.3 WIRING FOR POWER SUPPLY

- (1) Be sure to make sequence so that AC power is supplied to motor driver at 0.5 second and over after DC power supply unit (IPS) is energized. (Make sequence so that CLEAR signal will be applied to the digital control unit within the above period).
- (2) Disconnect the AC power supply to the motor driver at least 1 second before DC power supply unit (IPS) is de-energized. Servo error is not caused (error code : 02).
- (3) In case of vertical axis control applied, avoid dropping of object.

8.4 WIRING OF PROTECTIVE DEVICES

- (1) Make sure that contacts of thermal relay, thermostat for detection of fin temperature and fuse alarm are connected to the coil circuits of relay and that the power supply to Servopack is interrupted if they should operate.
- (2) When a driven machine has limited traveling distance, be sure to provide a limit switch for protection of the machine and control units, and make following sequence.
 - Apply dynamic braking if alarm limit switch operates.
 - Disconnect all the power if overtravel limit switch operates.
- (3) Overrunning of the motor as a result of failed TG or PG (breakage and disconnection of coil, etc.) cannot be prevented, so protect the machine and control unit by using alarm and overtravel limit switch.

8.5 WIRING PRECAUTIONS

- (1) Multi-core twisted shielded wire should be used as signal lead to motor driver.
- (2) Use a twisted shielded wire as feedback pulse signal lead from PG to motor driver.
- (3) For +5 V line receiver input, lead length should be 20 meters or less.
For +12 V line receiver input, lead length should be 5 meters or less.
- (4) For pulse reference line grounding, connect the shielding to motor driver.
For feedback line grounding, connect it to FG of B2823.
- (5) To avoid malfunction caused by noise.
 - Install an insulating transformer and line filter (LF) between DC power unit (IPS) and AC power supply.
 - Install the line filter, DC power unit, and B2823 as close as possible to each other.
 - Do not run connections to primary and secondary windings of the transformer and line filter together. Ground terminal should be connected to ground pole or the equivalent by ground conductor.
 - Connect surge-absorbing circuit to coils of relays, contactors and solenoids.
 - Make connection with a space of 30 cm between AC power lines and DC power lines or signal lines and do not run within the same bundle or duct.

9. TROUBLESHOOTING

9.1 B2823 ERROR CODE

This subsection describes the contents of various errors occurring when using the B2823, error codes and measures to be taken in the event of error.

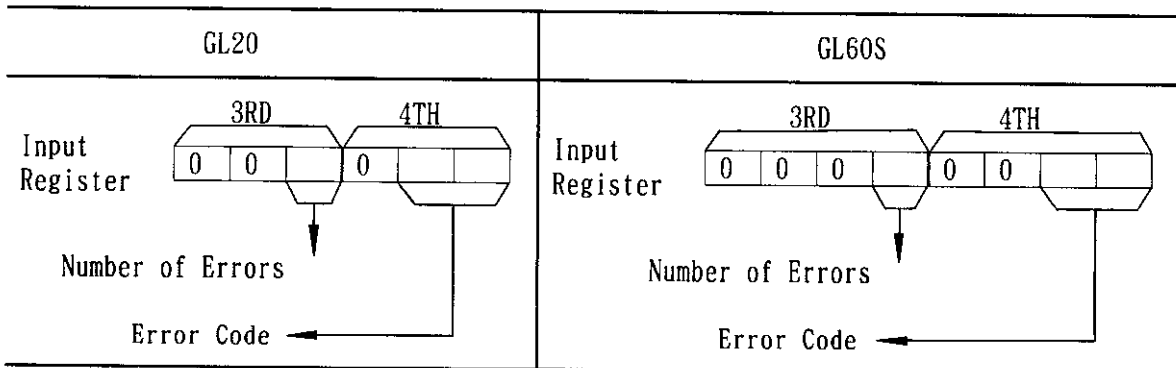
(1) Monitoring of Error Code

Error code can be monitored with the aid of the programing panel or RAP. For monitoring, implement the following procedures.

1. Error codes can be monitored by ON/OFF combination of monitors 1 to 3.

Output Coil Condition	monitor 1	monitor 2	monitor 3
ON/OFF State	ON	OFF	OFF
	ON	ON	OFF

2. The error code the number of errors and can be checked with the third and fourth input registers. The number of errors covers those classified according to error code. Therefore, even when multiple errors of the same error code occur, they are counted as 1. The smallest error code of those occurring is displayed as an error code.



3. When an error occurs, **ERR** LED keeps blinking till the error code is reset.

9.1 B2823 ERROR CODE (Cont'd)

(2) Hardware Error

Table 9.1 Hardware Error

Error Code	Cause	Corrective Action
—	ROM total check error	self-diagnosis error. Module must be reset or internal power supply must be turned off and then on again. If the same error recurs, replace B2823.
—	RAM check error	
—	WDT error	
01	External power supply fault (<u>P. OK</u> indicator lamp goes out.)	Check external power supply (+12V and +5V). On elimination of cause, error code disappears to enable continuing operation.
02	Servo fault External input signal \overline{SVOK} (SERVO NORMAL) is at H level.	Check the \overline{SVOK} input signal line. On elimination of cause, error code disappears to enable resuming operation.
04	Feedback pulse fault Deviation counter has overflowed in COIN mode of 65535 (FFFFH).	Review the servo system. For restoring the normal status, the module must be reset or the internal power supply must be turned off and then on again.

Notes:

1. If a hardware error occurs during any B2823 operation, pulse output stops (with deceleration time 0) and CLR output remains ON.
2. When the external power supply or the servo system is faulty, eliminating the cause turns off the error code and restores the normal status.
3. Even if the operation of B2823 stops during positioning due to servo fault the current value remains correct so far as the feedback signal line is normally operating.
4. The internal power supply means the power supply module on mounting base.

(3) Setting and Operational Errors

Table 9.2 Setting and Operational Errors

Error Code	Cause	Corrective Action
20	<ul style="list-style-type: none"> (1) Set data range is not met. (2) Output coil condition is not satisfied at the time of setting. (3) Initial setting or current value setting was attempted at other than stop (before completion of pulse output). (4) When setting 2-step speed pattern positioning, "auto positioning setting" output coil turns on only for one scan. (5) When setting 2-step speed pattern positioning, the relative positions of P₁ and P₂ are not in the same turning direction. 	Make correct setting again.
21	<ul style="list-style-type: none"> (1) START is turned on without setting the automatic positioning. (2) Zero return FWD or RVS command is turned on without setting the zero return. (3) JOGH or JOGL is turned on without JOG setting. 	Each start command is disregarded. After selecting the required setting, distribute the start command.
22	Scan time of CPU module is too short.	May occur when the CPU module contains no ladder circuit. Set scan time at 15ms or more. Save ladder circuit or assign dummy to prevent error.
23	Zero return "FWD command" or "RVS command" was attempted when DECEL LS is turned on.	Move until $\overline{\text{DECEL LS}}$ OFF by JOG or handle operation, and then try zero return again.
24	Current value over When countable range is exceeded in absolute mode, "current value over" input relay is turned on.	Return to the countable range by JOG, handle or zero return operation.
25	Overtravel fault $\overline{\text{FWD OVER LS}}$ or $\overline{\text{RVS OVER LS}}$ is turned on.	Move to the normal operation range by JOG, HANDLE or zero return operation.

9.1 B2823 ERROR CODE (Cont'd)

(4) Status Indication at Error

Table 9.3 Status Indication at Error

Error Contents	Input Relay			Indicator Lamp			External Output
	"READY"	"FAULT"	"ERROR"	"RDY"	"ABNO"	"ERR"	"FAULT"
Hardware Error (Self-diagnosis Error)	OFF	Un- dified	Un- dified	OFF	Un- dified	Un- dified	H level
Hardware Error (Error Codes 01, 02, 03, 04)	ON	ON	ON	ON	ON	ON	H level
Set Error, Operational Error	ON	OFF	ON	ON	OFF	ON	L level

9.2 TROUBLESHOOTING FOR SYSTEM

If a malfunction occurs, checking must be started with the assumption that the failure was caused by either erroneous operation or faulty equipment.

9.2.1 DC Power Supply

Faulty, or fluctuation of, DC power supply voltage exceeding limits shown below, may cause overrunning of the motor or inaccurate control. Voltage measured at the following terminals in B1083C should not exceed the limits given below.

Terminals No.

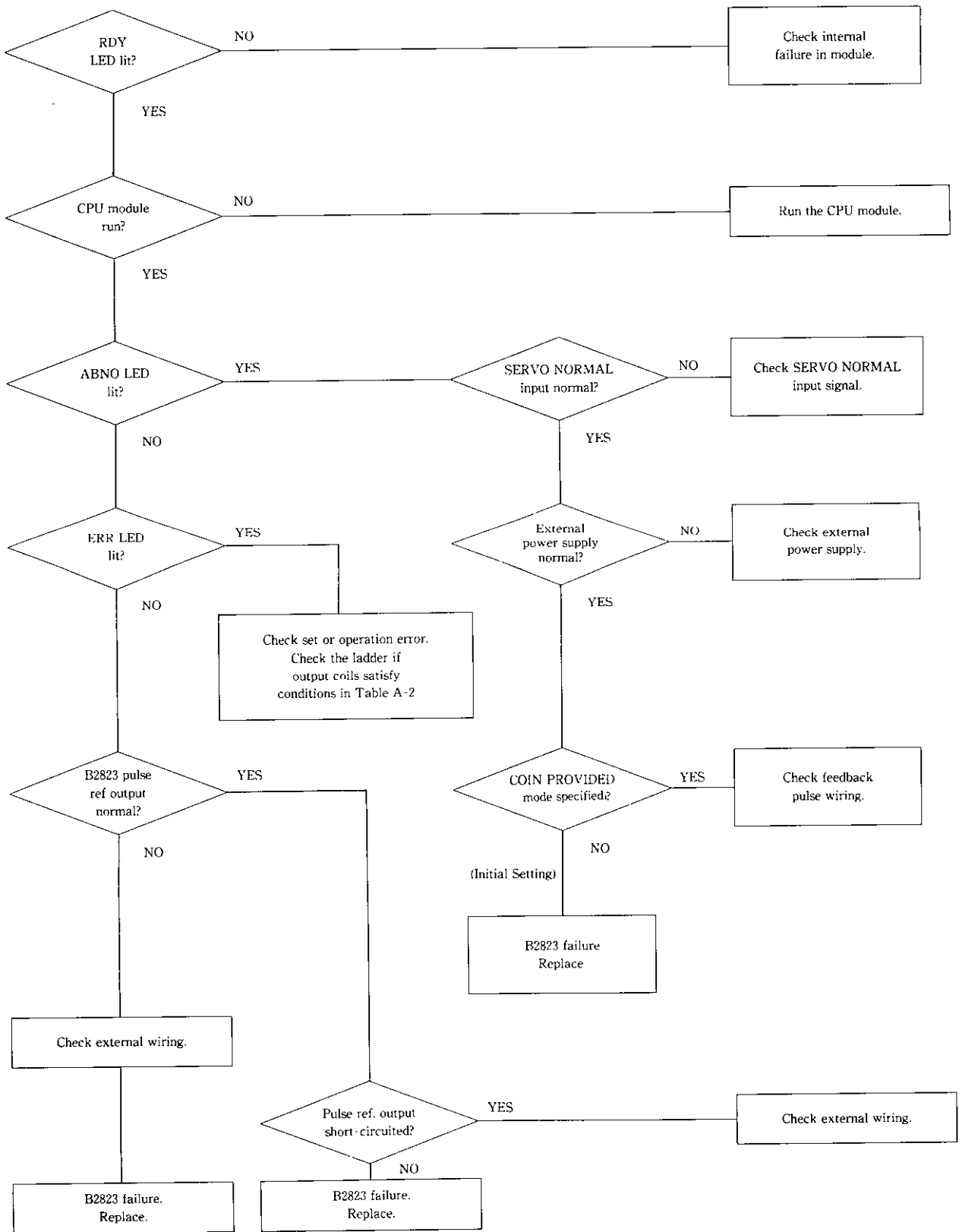
2CN-45, 46, 47: +12 V $\pm 5\%$

2CN-48, 49, 50: +5 V $\pm 5\%$

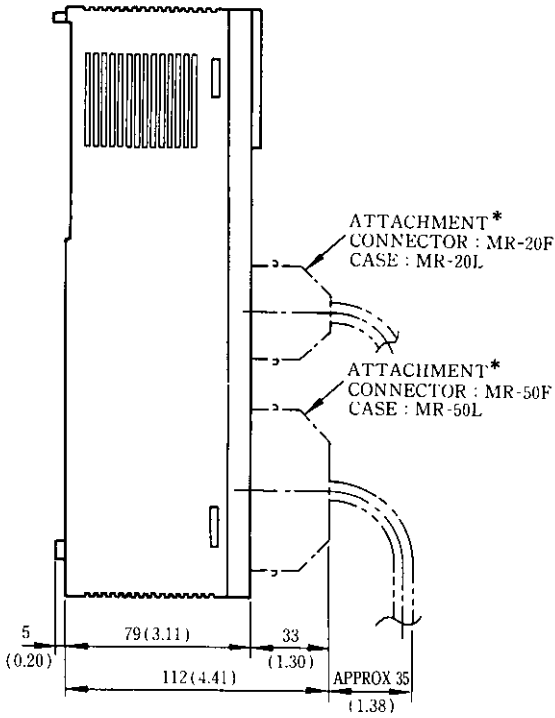
2CN-10, 11, 12: 0 V

If measured voltage exceeds the above limit, check the DC power supply unit and wiring. Wire size should be 2 mm² or above.

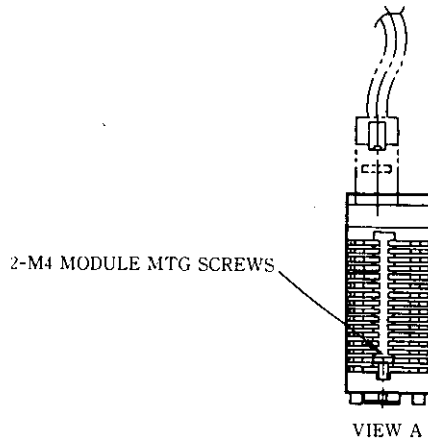
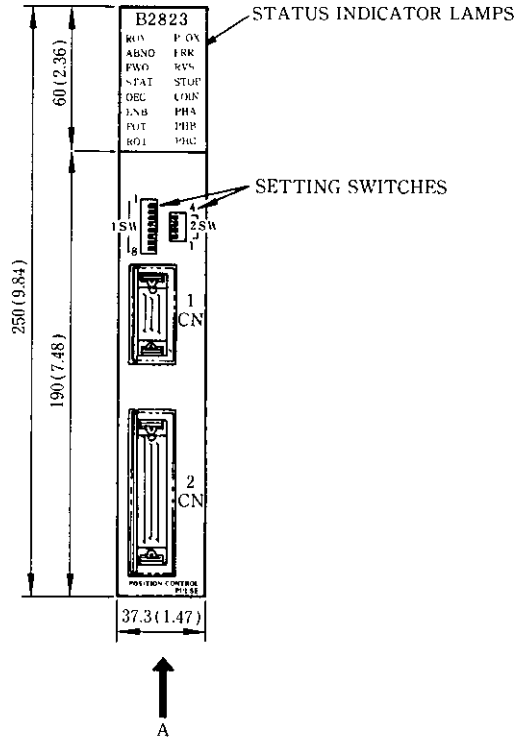
9.2.2 Motor does not Rotate



10. DIMENSIONS in mm (inches)



*MADE BY HONDA TSUSHIN



APPENDIX INTERNAL INTERFACE SIGNAL LIST

Table A-1 List of Output Coils

GL20	GL60S	Signal Name
0001 + 8n	00001 + 8n	Module reset
0002 + 8n	00002 + 8n	Initial setting
0003 + 8n	00003 + 8n	Not used
0004 + 8n	00004 + 8n	AUTO/ $\overline{\text{MAN}}$
0005 + 8n	00005 + 8n	START
0006 + 8n	00006 + 8n	STOP
0007 + 8n	00007 + 8n	Auto positioning setting
0008 + 8n	00008 + 8n	Current value setting
0009 + 8n	00009 + 8n	JOG setting
0010 + 8n	00010 + 8n	JOGH command
0011 + 8n	00011 + 8n	Zero return setting
0012 + 8n	00012 + 8n	FWD command for zero return
0013 + 8n	00013 + 8n	RVS command for zero return
0014 + 8n	00014 + 8n	Sign(+)/ $\overline{\text{Sign(-)}}$
0015 + 8n	00015 + 8n	Error code reset
0016 + 8n	00016 + 8n	Monitor 1
0017 + 8n	00017 + 8n	Monitor 2
0018 + 8n	00018 + 8n	Monitor 3
0019 + 8n	00019 + 8n	JOGL command
0020 + 8n	00020 + 8n	External pulse input enable (Manual pulse input enable)
0021 + 8n	00021 + 8n	Not used
0022 + 8n	00022 + 8n	Not used
0023 + 8n	00023 + 8n	Not used
0024 + 8n	00024 + 8n	Not used

n = 0, 1, 2

└─ Show the reference No. at output coil allocation.

Note : Signals 17+8n to 24+8n are treated as OFF in the module at 16-point allocation.

APPENDIX INTERNAL INTERFACE SIGNAL LIST (Cont'd)

Table. A-2 Output Coils and B2823 Functions

Reference No.	1	4	6	2	8	7	11	9	5	12	13	10	19	20	15
Coil Name Module Function	Module Reset	AUTO/ MAN	STOP	Initial Setting	Current Value Setting	Auto Positioning Setting	Zero Return Setting	JOG Setting	START	Zero FWD Point	Zero RVS Point	JOGH Command	JOGL Command	External Pulse Input Enable	Error Code Reset
Module Reset	Ⓜ														
STOP	—		①	—	—	—	—	—			—				
Initial	—	0	1	Ⓜ	—	—	—	—			—				
Current Value	—		1	—	Ⓜ	—	—	—							
Auto Positioning	—			—	—	Ⓜ	—	—							
Zero Return	—	0	1	—	—	—	Ⓜ	—							
JOG	—	0	1	—	—	—	—	Ⓜ	—	—	—				
Auto Positioning Start	—	1	0			—	—	—	Ⓜ	—	—				
Zero Return Start at FWD Run	—	1	0			—	—	—	—	Ⓜ	—				
Zero Return Start at RVS Run	—	1	0			—	—	—	—	—	Ⓜ				
JOGH	—	0	0			—						①	0		
JOGL	—	0	0			—						0	①		
HANDLE	—		1	—											①
Error Code Reset	—			—											Ⓜ


<Notes for Table A-2>

- 1 : ON, 0 : OFF, Ⓜ : OFF to ON, — : status remains unchanged, blank : not applicable.
①, Ⓜ : coil finally validated after conditions of other coils are arranged.
- Priority is given to JOGH or JOGL operation depending on which is selected earlier, JOGH or JOGL command. At this time, the ON/OFF status of the command is disregarded. If both commands are turned on simultaneously, priority is given to the JOGL command.
- If two or more output coils are turned on simultaneously among START, zero return FWD command or RVS command, commands are invalidated with no error code assigned.

Table A-3 List of Input Coils

GL20	GL60S	Signal Name
1001+ 8n	10001+ 8n	READY
1002+ 8n	10002+ 8n	PRESET ACK
1003+ 8n	10003+ 8n	SIGN(+)/SIGN(-)
1004+ 8n	10004+ 8n	Multi-step speed monitor 1
1005+ 8n	10005+ 8n	Multi-step speed monitor 2
1006+ 8n	10006+ 8n	PLUS/MINUS
1007+ 8n	10007+ 8n	Current value over
1008+ 8n	10008+ 8n	Forward over LS
1009+ 8n	10009+ 8n	COIN
1010+ 8n	10010+ 8n	DECEL LS
1011+ 8n	10011+ 8n	ERROR
1012+ 8n	10012+ 8n	Fault
1013+ 8n	10013+ 8n	Reverse over LS
1014+ 8n	10014+ 8n	Zero return pulse output completion
1015+ 8n	10015+ 8n	Positioning pulse output completion
1016+ 8n	10016+ 8n	PRESET NAK

n=0, 1, 2

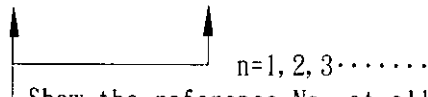


Show the reference No. at input relay allocation.

APPENDIX INTERNAL INTERFACE SIGNAL LIST (Cont'd)

Table A-4 Output Register Allocation

GL20	GL60S	Output Register No.
4001+n	40001+n	1ST
4002+n	40002+n	2ND
4003+n	40003+n	3RD
4004+n	40004+n	4TH
4005+n	40005+n	5TH
4006+n	40006+n	6TH




 $n=1, 2, 3, \dots$

 Show the reference No. at allocation of output registers.

Table A-5 Input Register Allocation

GL20	G060S	Input Register No.
3001+n	30001+n	1ST
3002+n	30002+n	2ND
3003+n	30003+n	3RD
3004+n	30004+n	4TH
3005+n	30005+n	5TH
3006+n	30006+n	6TH



 $n=0, 1, 2, \dots$

 Show the reference No. at allocation of input registers.

Table A-6 Setting of Initial Value in Output Register

{ GL20

--	--	--

 (3 digits) GL60S

--	--	--	--

 (4 digits) }

<p style="text-align: center;">1ST</p> <div style="display: flex; align-items: center; justify-content: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">7</td></tr> </table> </div> <div style="margin-top: 10px;"> <p>Setting of COIN detection width \pm(0 to 99)</p> <p>Setting of operation mode (0: 1-step speed pattern, 1: 2-step speed pattern)</p> </div>	0	0	0	7	<p style="text-align: center;">3RD</p> <div style="display: flex; align-items: center; justify-content: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td></tr> </table> </div> <div style="margin-top: 10px;"> <p>Setting of linear accel/ decel time scale (0: $\times 10$ ms, 1: $\times 0.1$ S)</p> <p>Resetting of current value { 0: Not reset } 1: Reset</p> <p>Setting of position command mode { 0: Incremental mode } 1: Absolute mode</p> </div>	0	0	0	0
0	0	0	7						
0	0	0	0						
<p style="text-align: center;">2ND</p> <div style="display: flex; align-items: center; justify-content: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">1</td><td style="width: 20px; height: 20px;">0</td></tr> </table> </div> <div style="margin-top: 10px;"> <p>Setting of pulse count mode { 1: $\times 1$ multiplier } 2: $\times 2$ multiplier } 4: $\times 4$ multiplier }</p> </div>	0	0	1	0	<p style="text-align: center;">4TH</p> <div style="display: flex; align-items: center; justify-content: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">1</td><td style="width: 20px; height: 20px;">0</td><td style="width: 20px; height: 20px;">0</td></tr> </table> </div> <div style="margin-top: 10px;"> <p>Setting of zero return mode (0: mode B 1: mode A)</p> <p>COIN detection mode setting { 0: COIN detection mode } 1: NO-COIN detection mode }</p> </div>	0	1	0	0
0	0	1	0						
0	1	0	0						



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YASKAWA Electric Mfg. Co., Ltd.

TOKYO OFFICE Ohtemachi Bldg., 1-6-1 Ohtemachi, Chiyoda-ku, Tokyo, 100 Japan
Phone (03) 284-9111, -9145 Telex YASKAWA J33530 Fax (03) 284-9034

SEOUL OFFICE Seoul Center Bldg., 91-1, So Kong-Dong, Chung-Ku, Seoul, Korea
Phone (02) 776-7844 Fax (02) 753-2639

SINGAPORE OFFICE CPF Bldg., 79 Robinson Road No 24-03, Singapore 0106
Phone 2217530 Telex (87) 24890 YASKAWA RS Fax (65) 224-5854

TAIPEI OFFICE Union Commercial Bldg., 137, Nanking East Road, Sec 2, Taipei, Taiwan
Phone (02) 507-7065, -7732 Fax (02) 506-3837

YASKAWA ELECTRIC AMERICA, INC.: SUBSIDIARY

Chicago Office (Head Office) 3160 MacArthur Blvd, Northbrook, Illinois 60062-1917, U S A
Phone (708) 291-2340, 291-2348 Telex (230) 270197 YSKW YSNC NBRK Fax (708) 498-2430, 480-9731

Los Angeles Office 7341 Lincoln Way, Garden Grove, California 92641, U S A
Phone (714) 894-5911 Telex (230) 678396 YASKAWAUS TSTN Fax (714) 894-3258

New Jersey Office 30 Two Bridges Road, Fairfield, New Jersey 07006, U S A.
Phone (201) 575-5940 Fax (201) 575-5947

YASKAWA ELECTRIC EUROPE GmbH: SUBSIDIARY

Niederhochstadter Straße 71-73, 6242 Kronberg-Oberhochstadt, West Germany
Phone (06173) 640071, 640072, 640073 Telex 415660 YASE D Fax (06173) 68421

YASKAWA ELETRICO DO-BRASIL COMERCIO LTDA.: SUBSIDIARY

Av. Brig. Faria Lima, 1664-cj 721/724 Pinheiros, São Paulo-SP, Brasil CEP-01452
Phone (011) 813-3933, 813-3694 Telex (011) 82869 YSKW BR Fax (011) 815-8795

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