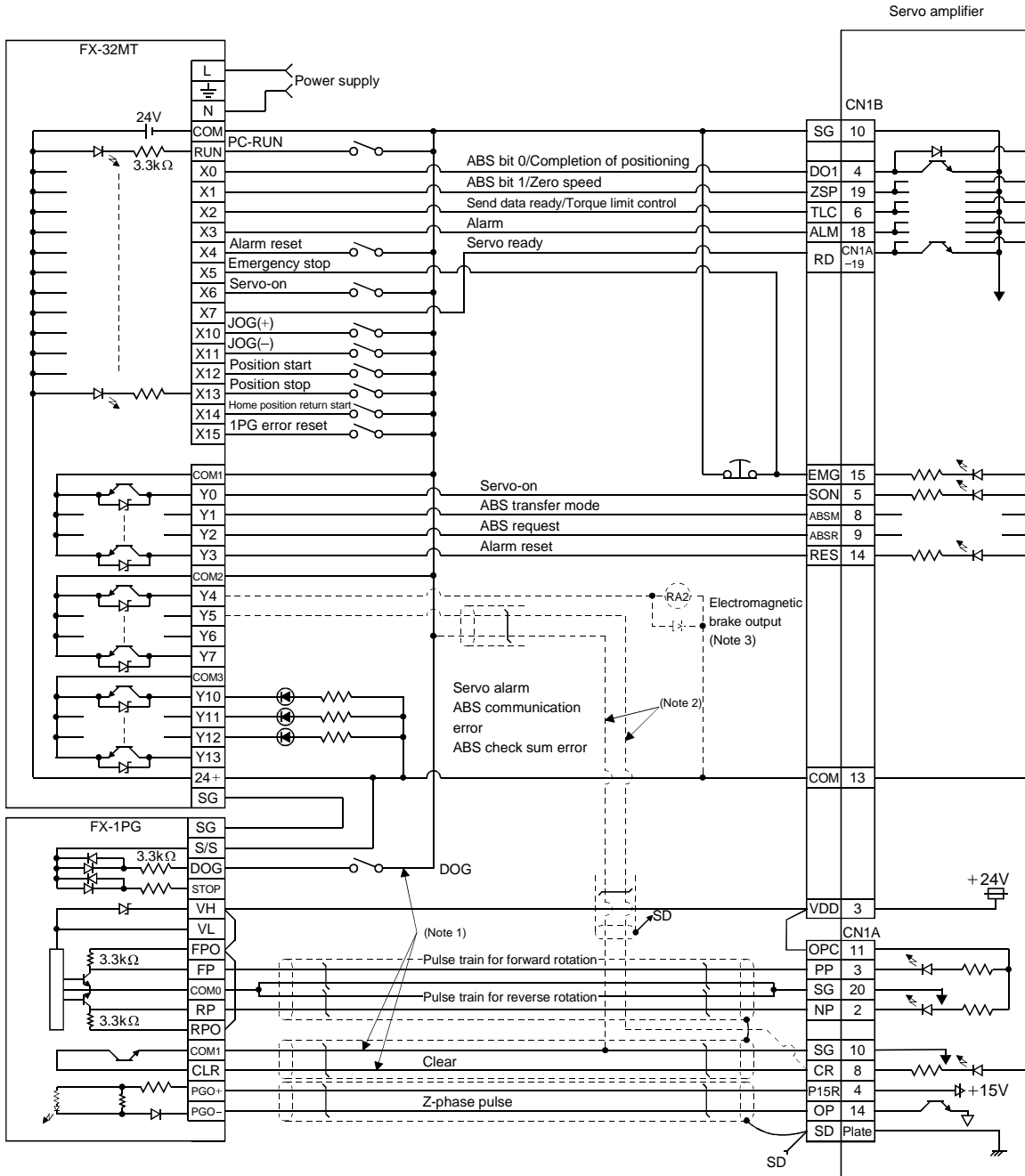


# 15. ABSOLUTE POSITION DETECTION SYSTEM

## 15.8.2 MELSEC FX(2N)-32MT (FX(2N)-1PG)

### (1) Connection diagram

#### (a) FX-32MT (FX-1PG)



- Note 1. To be connected for the dog type home position setting. At this time, do not connect the portions marked (Note 2).
- Note 2. To be connected for the data set type home position setting. At this time, do not connect the portions marked (Note 1).
- Note 3. The electromagnetic brake interlock (MBR) should be controlled by connecting the programmable controller output to a relay.



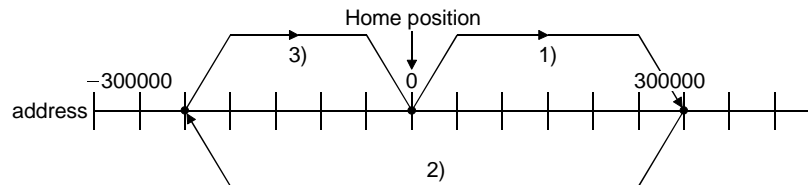
## 15. ABSOLUTE POSITION DETECTION SYSTEM

### (2) Sequence program example

#### (a) Conditions

##### 1) Operation pattern

ABS data transfer is made as soon as the servo-on pushbutton is turned on. After that, positioning operation is performed as shown below:



After the completion of ABS data transmission, JOG operation is possible using the JOG+ or JOG– pushbutton switch.

After the completion of ABS data transmission, dog type home position return is possible using the home position return pushbutton switch.

##### 2) Buffer memory assignment

For BFM#26 and later, refer to the FX2(N)-1PG User's Manual.

BMF No.		Name and symbol	Set value	Remark	
Upper 16 bits	Lower 16 bits				
-	#0	Pulse rate A	2000	Command unit: Pulses	
#2	#1	Feed rate B	1000		
-	#3	Parameter	H0000		
#5	#4	Max. speed Vmax	10000PPS		
-	#6	Bias speed Vbia	0PPS		
#8	#7	JOG operation Vjog	10000PPS		
#10	#9	Home position return speed (high speed) VRT	50000PPS		
-	#11	Home position return speed (creep) VCL	1000PPS		
-	#12	Home position return zero-point signal count N	2 pulses		Initial value: 10
#14	#13	Home position address HP	0		Initial value: 100
-	#15	Acceleration/deceleration time Ta	200ms		
-	#16	Not usable			
#18	#17	Target address (I) P(I)	0		
#20	#19	Operation speed (I) V(I)	100000		
#22	#21	Target address (II) P(II)	0	Initial value: 10	
#24	#23	Operation speed (II) V(II)	10		
-	#25	Operation command	H0000		

##### 3) Instructions

When the servo-on pushbutton switch and the GND of the power supply are shorted, the ABS data is transmitted when the servo amplifier power is turned ON, or at the leading edge of the RUN signal after a PC reset operation (PC-RESET). The ABS data is also transmitted when an alarm is reset, or when the emergency stop state is reset.

If check sum discrepancy is detected in the transmitted data, the ABS data transmission is retried up to three times. If the check sum discrepancy is still detected after retrying, the ABS check sum error is generated (Y12 ON).

The following time periods are measured and if the ON/OFF state does not change within the specified time, the ABS communication error is generated (Y11 ON).

ON period of ABS transfer mode (Y1)

ON period of ABS request (Y2)

OFF period of ready to send the ABS data (X2).

# 15. ABSOLUTE POSITION DETECTION SYSTEM

## (b) Device list

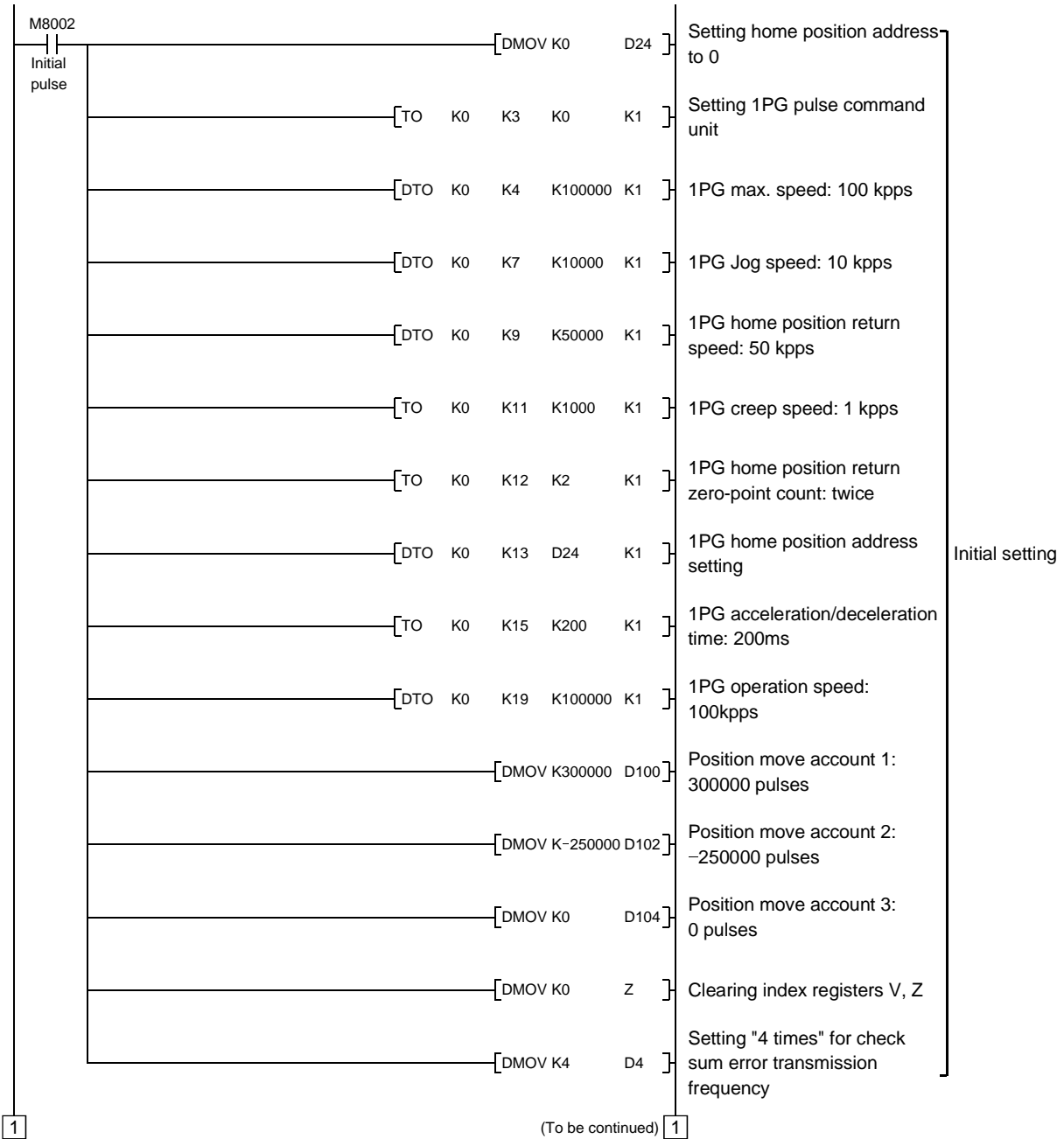
X input contact		Y output contact	
X0	ABS bit 0 / completion of positioning	Y0	Servo-on
X1	ABS bit 1 / zero speed	Y1	ABS transfer mode
X2	Send ABS data ready/ torque limit control	Y2	ABS request
X3	Servo alarm	Y3	Alarm reset
X4	Alarm reset PB	Y4 (Note 2)	Electromagnetic brake output
X5	Servo emergency stop	Y5 (Note 1)	Clear
X6	Servo-on PB	Y10	Servo alarm
X7	Servo ready	Y11	ABS communication error
X10	JOG (+) PB	Y12	ABS check sum error
X11	JOG (-) PB		
X12	Position start PB		
X13	Position stop PB		
X14	Home position return start PB		
X15	1PG error reset		
D register		M contact	
D0	ABS data: Lower 16 bits	M0	Error flag
D1	ABS data: Upper 16 bits	M1	ABS data transmission start
D2	Check sum addition counter	M2	Retry command
D3	Check data in case of check sum error	M3	ABS data read
D4	Transmission retry count in check sum discrepancy	M4	Spare
D24	Home position address: Lower 16 bits	M5	Servo-on request
D25	Home position address: Upper 16 bits	M6	Retry flag
D106	1PG present position address: Lower 16 bits	M10	ABS data 2 bit receiving buffer
D107	1PG present position address: Upper 16 bits	M11	
		M12	
		M13	
		M20	ABS data 32 bit buffer
		↓	
		M51	Check sum 6 bit buffer
		M52	
		↓	
		M57	For checksum comparison
		M58	
		M59	
		M62	Sum check discrepancy (greater) >
		M63	Sum check discrepancy =
		M64	Sum check discrepancy (less) >
		M70 (Note 1)	Clear (CR) ON timer request
		M71 (Note 1)	Data set type home position return request
		M99	ABS data ready
T timer		C counter	
T200	Retry wait timer	C0	All data reception frequency counter (19 times)
T201	ABS transfer mode timer	C1	Check sum reception frequency counter
T202	ABS request response timer	C2	ABS data reception frequency counter (16 times)
T203	Ready to send response timer		
T204	ABS data waiting timer		
T210 (Note 1)	Clear (CR) ON timer		

Note 1. Necessary when data set type home position return is executed.

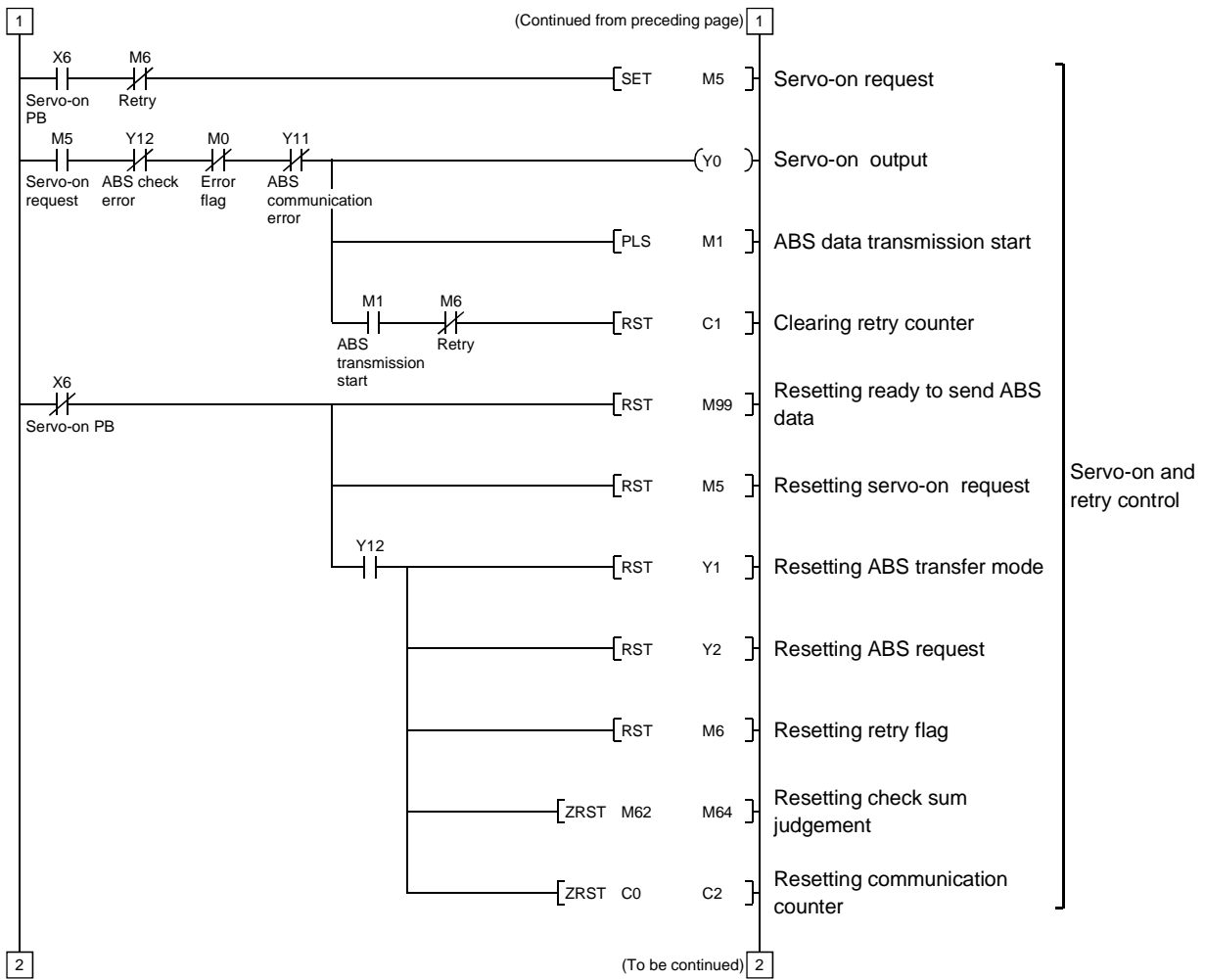
2. Necessary in the event of electromagnetic brake output.

# 15. ABSOLUTE POSITION DETECTION SYSTEM

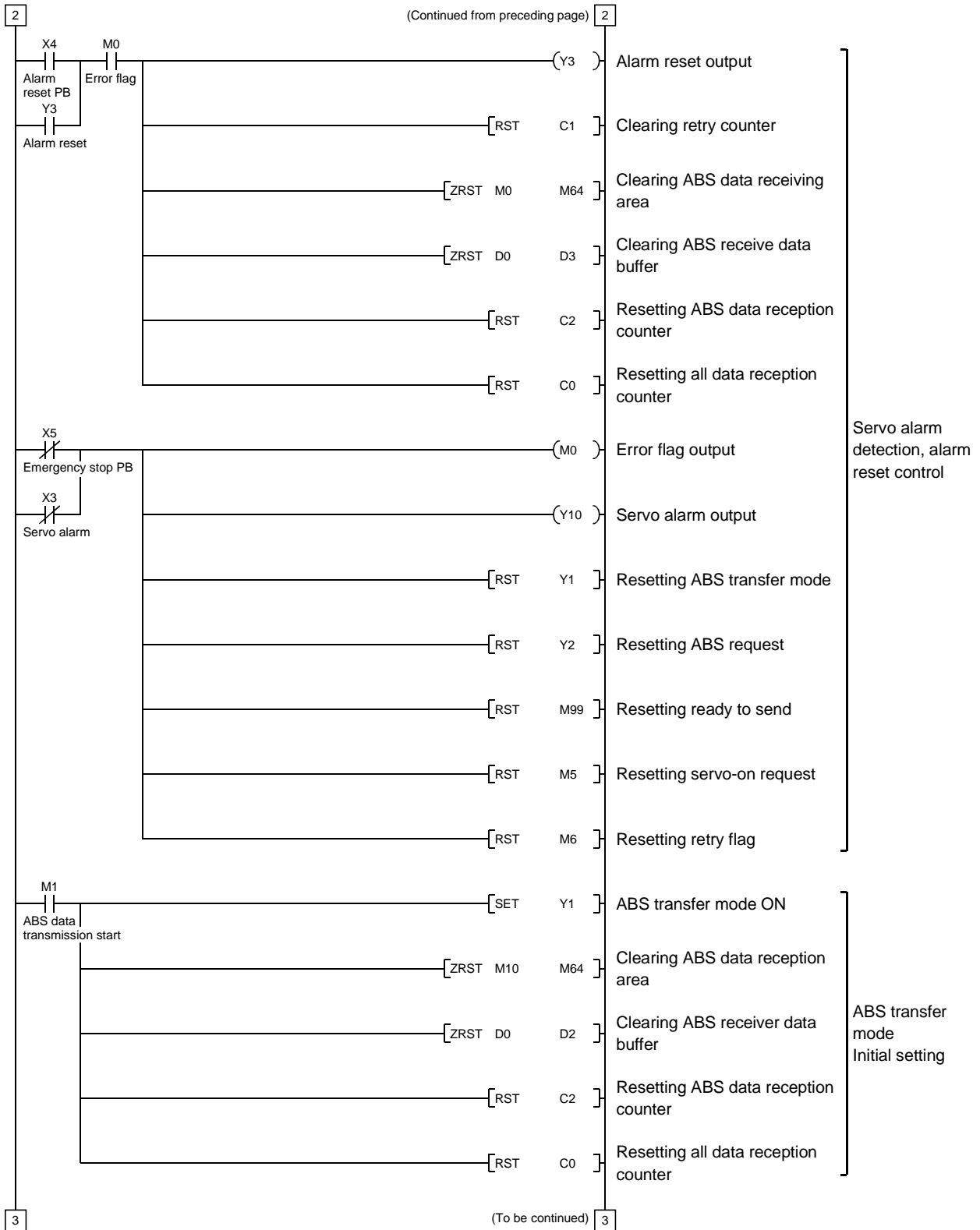
(c) ABS data transfer program for X-axis



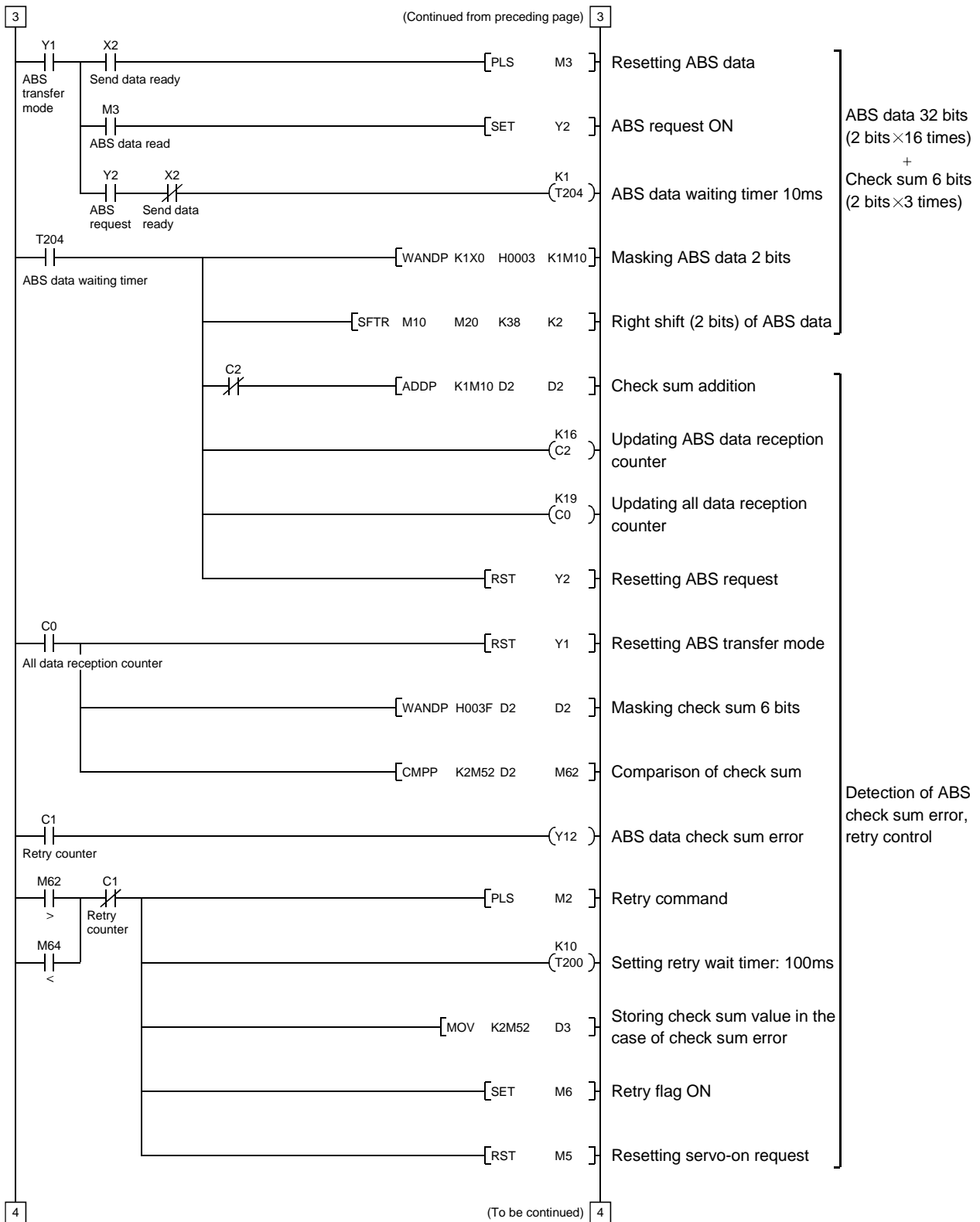
# 15. ABSOLUTE POSITION DETECTION SYSTEM



# 15. ABSOLUTE POSITION DETECTION SYSTEM

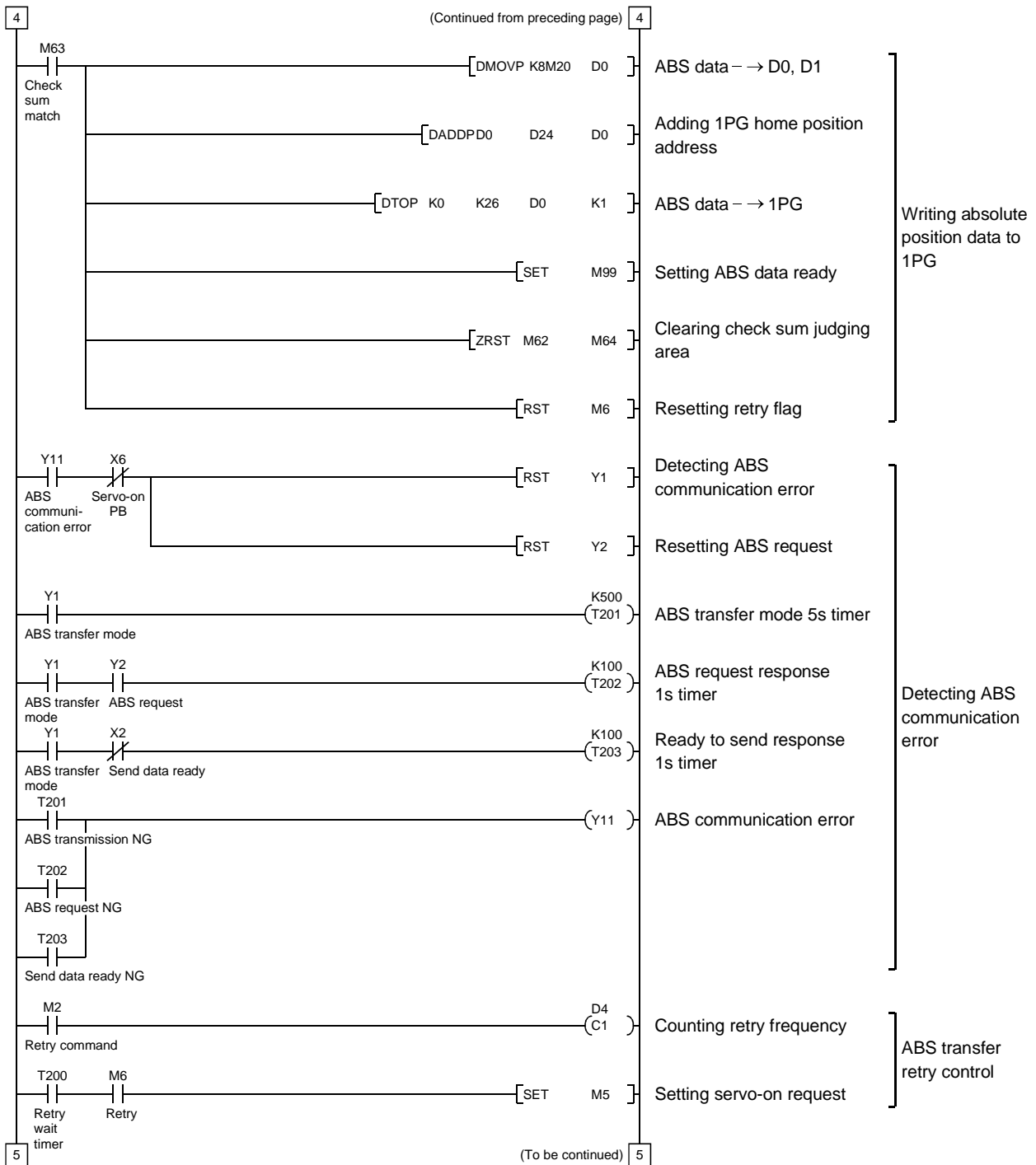


# 15. ABSOLUTE POSITION DETECTION SYSTEM

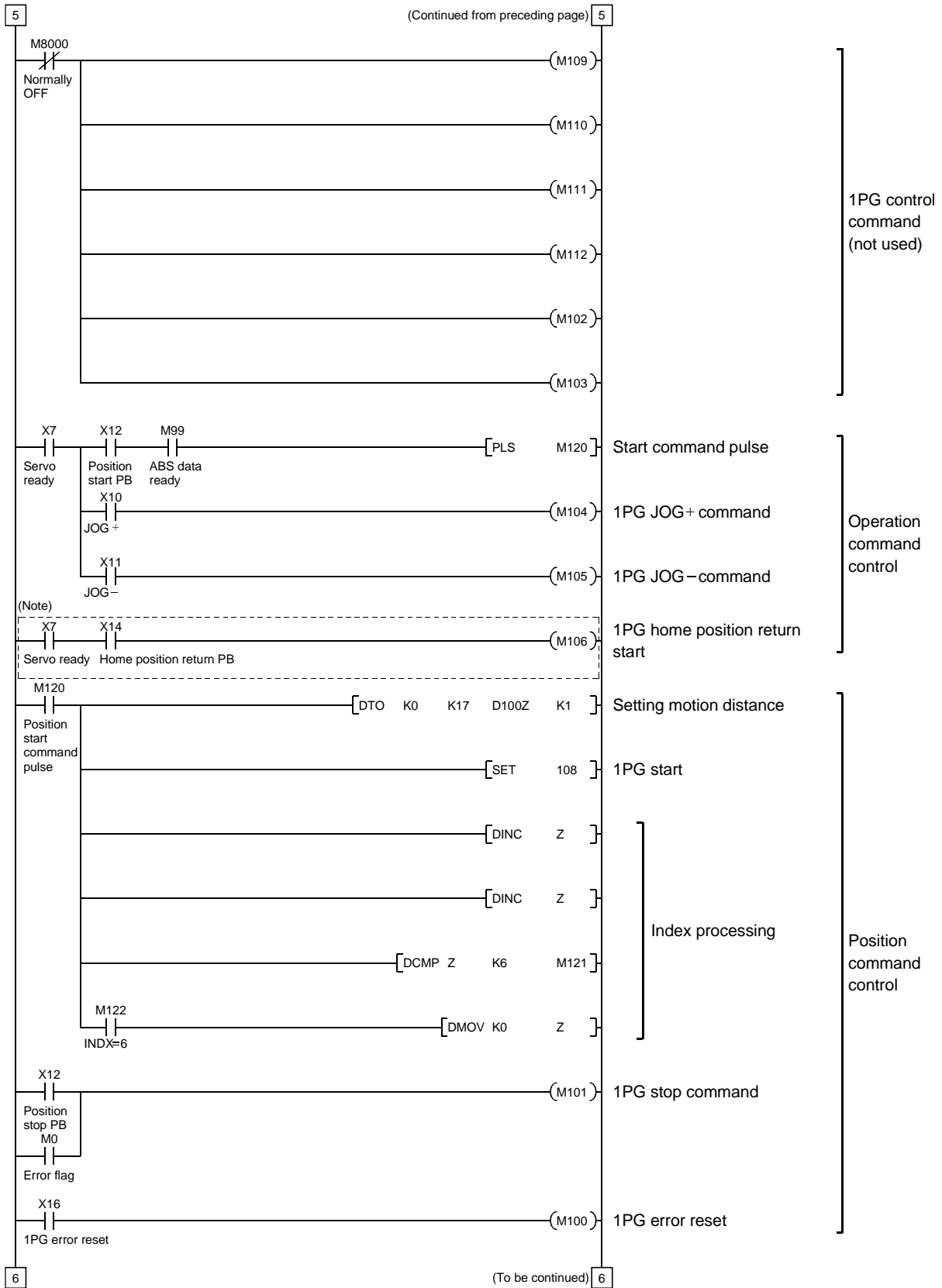




# 15. ABSOLUTE POSITION DETECTION SYSTEM

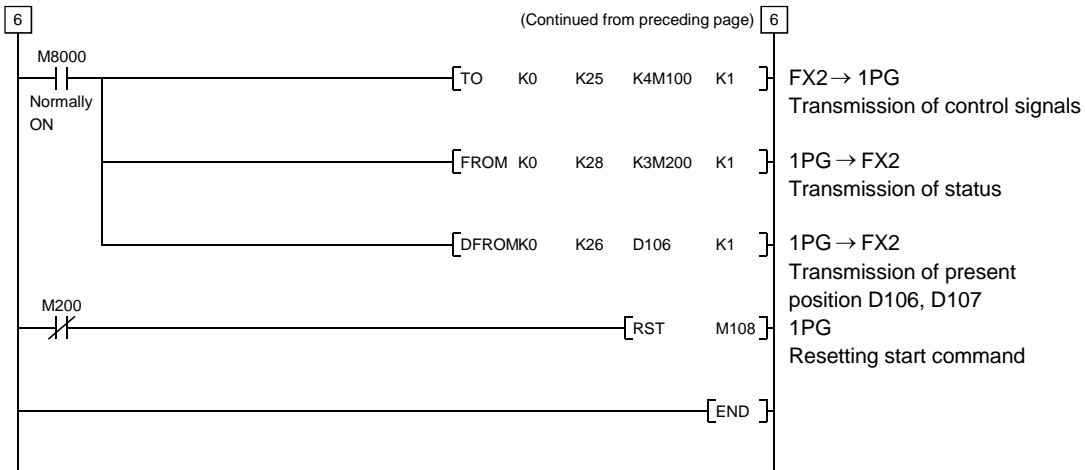


# 15. ABSOLUTE POSITION DETECTION SYSTEM



Note. Program example for the dog type home position return. For the data set type home position return, refer to the program example in (2), (d) in this section.

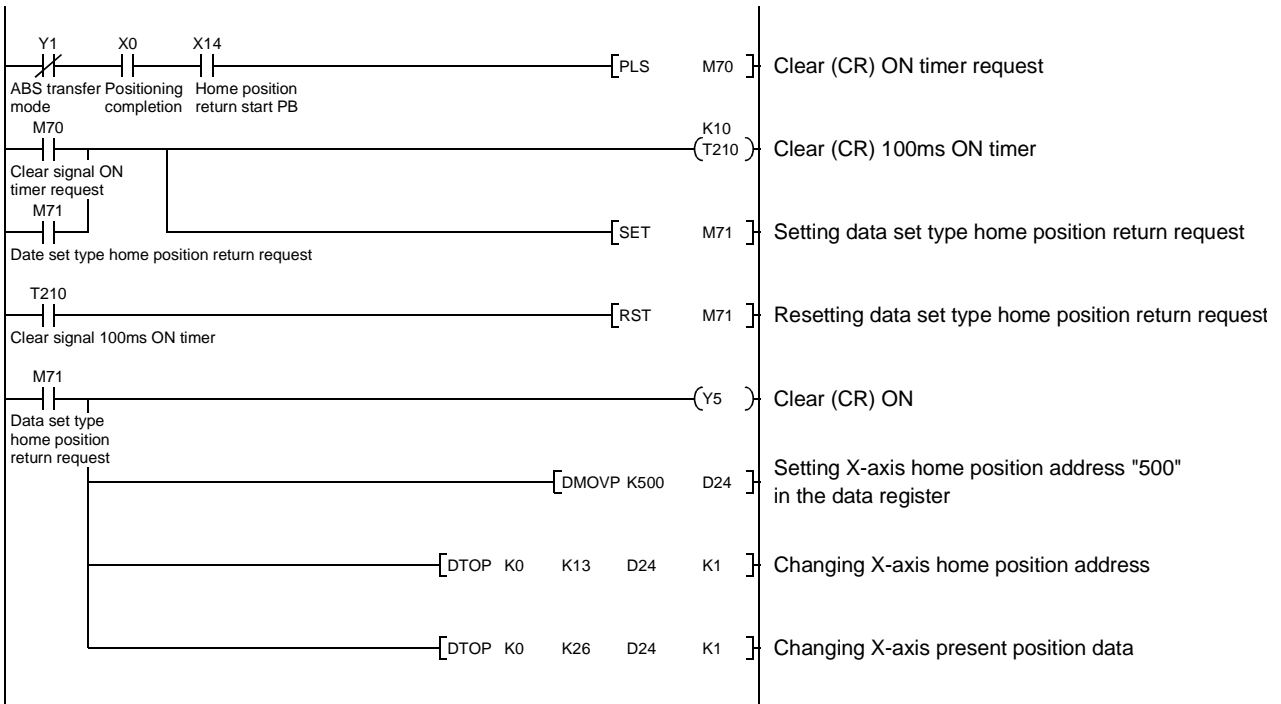
# 15. ABSOLUTE POSITION DETECTION SYSTEM



### (d) Data set type home position return

After jogging the machine to the position where the home position (e.g.500) is to be set, choose the home position return mode set the home position with the home position return start (PBON). After switching power on, rotate the servo motor more than 1 revolution before starting home position return.

Do not turn ON the clear (CR) (Y5) for an operation other than home position return. Turning it ON in other circumstances will cause position shift.

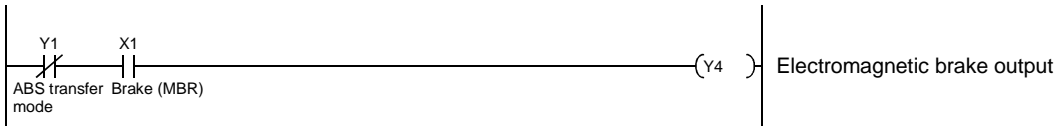


# 15. ABSOLUTE POSITION DETECTION SYSTEM

(e) Electromagnetic brake output

During ABS data transfer (for several seconds after the servo-on (SON) is turned on), the servo motor must be at a stop.

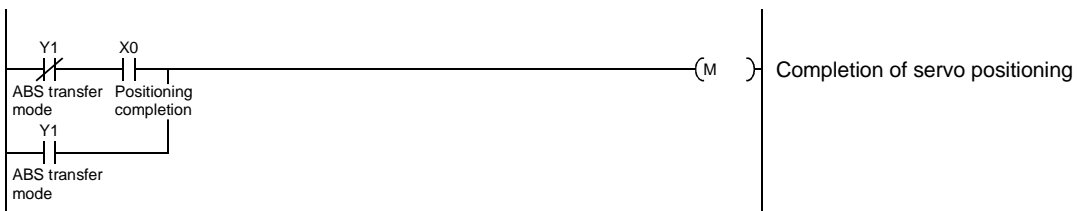
Set "1□1□" in parameter No. 1 of the servo amplifier to choose the electromagnetic brake interlock (MBR).



(f) Positioning completion

To create the status information for servo positioning completion.

During ABS data transfer (for several seconds after the servo-on (SON) is turned on), the servo motor must be at a stop.



(g) Zero speed

To create the status information for servo zero speed.

During ABS data transfer (for several seconds after the servo-on (SON) is turned on), the servo motor must be at a stop.



(h) Torque limiting

To create the status information for the servo torque limiting mode.

During ABS data transfer (for several seconds after the servo-on (SON) is turned on), the torque limiting must be off.

