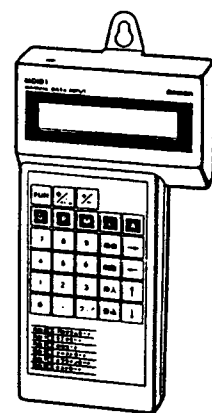




USER'S MANUAL

For MDI



MODEL **3F88M-116**

SINGLE AXIS POSITIONER

3.1 The list of the MDI's function

◎ Program mode (FUN 0[]) <automatic mode only>

Each function of program mode are provided for processing parameter data and NC program data memory which are stored in the positioner.

FUN No	Meaning	Explanation
FUN 00	Selection of unit No.	Designate a positioner to be connected with the MDI.
FUN 01	Edit parameter	Input characters, figures, etc in compliance with each parameter function including backlash, in-position, etc.
FUN 02	Edit program	Input numerical data in compliance with each G code's function including G01 (positioning), G04 (dwell), etc.
FUN 03	Edit data memory	Set feed lengths which are used for indirect designation in G01 (positioning), G09 (outer positioning), etc.
FUN 04	Check [parameter, program, data memory]	Each edited parameter, program and data memory are 1) checked form of data, 2) transferred to operation mode, 3) registered to memory range of the positioner.
FUN 05	Write data on the IC card	Write contents of registered parameter, program, data memory on the IC card.
FUN 06	Read data from the IC card	Read data of parameter, program, data memory from an IC card and register on the the positioner.
FUN 07	Verify data with the IC card	Verify contents of parameter, program, data memory which are registered in the IC card with ones registered in the positioner.

⊙ Monitor mode (FUN 1[]) <automatic mode only>

Operational conditions of the positioner are transferred to the MDI and displayed on the LCD to notice operators.

FUN No	Meaning	Explanation
FUN 10	Displays present position	Displays present position data which is supplied from the positioner.
FUN 11	Displays deflection value	Displays deflection value which is supplied from the positioner.
FUN 12	Displays input signals	Displays input signal condition from the outside.
FUN 13	Displays output signals	Displays output signal condition to the outside.
FUN 14	Displays executing program	Displays program number, block number, G code of executing.
FUN 15	Displays run/alarm condition	Displays running condition or alarm condition.

⊙ Command mode (FUN 2[]) <automatic mode only>

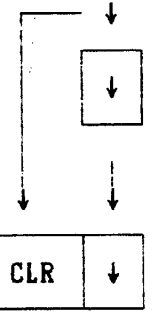
Command mode requests the positioner to execute operation. Each request from the MDI can check whether or not the positioner executes the requested operations.

FUN No	Meaning	Explanation
FUN 20	Zero search command	Command the positioner to zero search.
FUN 21	Zero return command	Command the positioner to zero return.
FUN 22	Program operation	Command the positioner to execute registered programs.
FUN 23	One block operation	Command the positioner to execute block operation of registered program.
FUN 24	JOG operation	Command the positioner to execute JOG operation.

(1) Display present position (FUN 10)

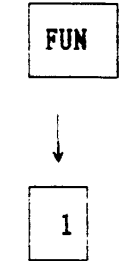
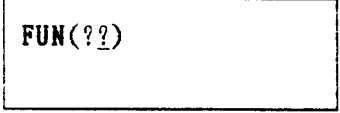
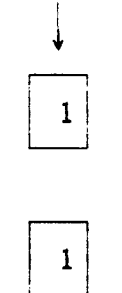
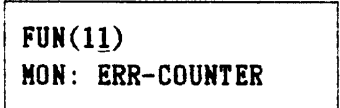
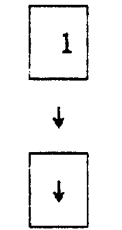
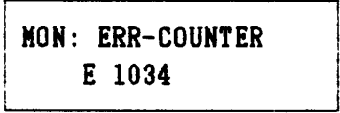

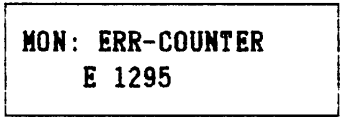

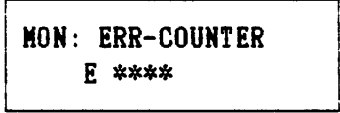

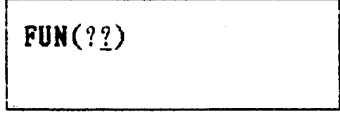

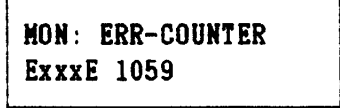
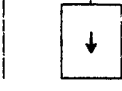

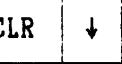
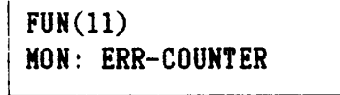
Displays present position which is supplied by the positioner.
 Displayed data are always renewed data.

Operation	Display	Explanation
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUN(??)</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">1</div>		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">0</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUN(10) MON: POSITION</div>	An initial condition of present position display.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: POSITION x 234.56mm</div>	Display of present position starts. In "x," one of X, Y, Z, or S appears with regard to parameter C05 value.
↓	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: POSITION x 237.45mm</div>	<ul style="list-style-type: none"> · Renewed values are displayed one by one. · One of mm, inch, degree, or none is displayed as unit by parameter C31 setting. · Position of decimal point is fixed by parameter C30.
↓	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: POSITION x *****mm _</div>	When the positioner does not supply data of present position, the display shows *****.
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUN(??)</div>	Finished display of present position, and waiting for next selection of function.
↓	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: POSITION Exxxx 500.00mm</div>	When a transfer error occurs while monitoring, its error code is displayed.

Operation	Display	Explanation
 <p>The diagram illustrates a sequence of operations. It starts with a downward arrow pointing to a box containing a downward arrow. This is followed by another downward arrow pointing to a box containing the text 'CLR' and a downward arrow. A vertical line on the left side of the diagram connects the top of the first box to the top of the second box, with a horizontal line extending from the top of the first box to the left and then down to the second box, indicating a flow or continuation of the process.</p>	<div data-bbox="464 286 802 405" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Exxx ERROR MESSAGE </div> <div data-bbox="464 472 802 591" style="border: 1px solid black; padding: 5px;"> FUN(10) MON: POSITION </div>	<p data-bbox="847 315 1273 383">Error code and error message are displayed.</p> <p data-bbox="847 499 1321 566">The display becomes the initial display of monitor mode.</p>

(2) Display of deflection value (FUN 11)


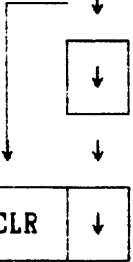
Displays deflection value which is supplied from the positioner.

Operation	Display	Explanation
		
		<p>An initial display of deflection.</p>
		<p>Starts display of deflection value.</p>
		<p>Renewed value is displayed.</p>
		<p>When control signals are not supplied to the motor, display appears **** on LCD.</p>
		<p>Finished display of deflection value, and waiting for next selection of function.</p>
		<p>When an error occurs, its error code is displayed.</p>
		<p>The error code and error message are displayed.</p>
		<p>Return to initial condition.</p>

(3) Display input signal (FUN 12)

Displays input signal condition from the outside to the positioner.
Displays are always renewed data.

Operation	Display	Explanation
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUN(??)</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">1</div>		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">2</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">FUN(12) MON: INPUT-SIG</div>	An initial condition of input signal display.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=0 1100 0000 0000 0000</div>	First, condition of input No.= 0 appears.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=0 1100 0010 0000 1000</div>	Renewed value is displayed.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=1 1100 0110 0000 0000</div>	Input signal No. is renewed and referred data is displayed.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=2 0000 0000 0000 0000</div>	Input signal No. changes as 0 → 1 → 2 → 0 sequentially with each press of [↓] key.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=2 1100 0010 0000 1000</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↑</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">MON: INPUT-SIG NO=2 0000 0000 0000 0000</div>	Input signal No. changes 2 → 1 → 0 → 2 sequentially with each press of [↑] key.
↓		

Operation	Display	Explanation
	<div data-bbox="472 286 810 405" style="border: 1px solid black; padding: 5px;">FUN(??)</div> <div data-bbox="472 439 810 557" style="border: 1px solid black; padding: 5px;">MON: INPUT-SIG NO=1 Exxx 0110 0000 0000</div>	<p data-bbox="855 280 1326 383">Ends display of input signal condition, and waiting for next selection of function.</p> <p data-bbox="855 465 1326 528">When an error occurs, its error code is displayed.</p>
	<div data-bbox="472 584 810 703" style="border: 1px solid black; padding: 5px;">Exxx ERROR MESSAGE</div> <div data-bbox="472 736 810 855" style="border: 1px solid black; padding: 5px;">FUN(12) MON: INPUT-SIG</div>	<p data-bbox="855 611 1337 674">The error code and error message appear.</p> <p data-bbox="855 757 1206 819">Recover initial display condition.</p>

Condition of 0/1 of each input signal No. 0, 1, 2 means signal condition shown in the below chart:

MON: INPUT-SIG NO=X															
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯


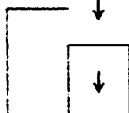
No	NO = 0	Signal condition		No	NO = 2	Signal condition	
		0	1			0	1
①	Emergency stop	Yes	No	①	Correction value 8000	No	Yes
②	Ready operation	No	Yes	②	Correction value 4000	No	Yes
③	- - -	-	-	③	Correction value 2000	No	Yes
④	Program No.10	No	Yes	④	Correction value 1000	No	Yes
⑤	Program No.8	No	Yes	⑤	Correction value 800	No	Yes
⑥	Program No.4	No	Yes	⑥	Correction value 400	NO	Yes
⑦	Program No.2	No	Yes	⑦	Correction value 200	NO	Yes
⑧	Program No.1	No	Yes	⑧	Correction value 100	No	Yes
⑨	Alarm reset	No	Yes	⑨	Correction value 80	No	Yes
⑩	Zero return	No	Yes	⑩	Correction value 40	No	Yes
⑪	Zero search	No	Yes	⑪	Correction value 20	No	Yes
⑫	Temporary stop	No	Yes	⑫	Correction value 10	No	Yes
⑬	Program start	No	Yes	⑬	Correction value 8	No	Yes
⑭	Manual selection	No	Yes	⑭	Correction value 4	No	Yes
⑮	Manual CW	No	Yes	⑮	Correction value 2	No	Yes
⑯	Manual CCW	No	Yes	⑯	Correction value 1	No	Yes

No	NO = 1	Signal condition	
		0	1
①	Servo alarm	Yes	No
②	MDI connection	PC	MID
③	- - -		
④	Interrupt	No	Yes
⑤	Zero deceleration	No	Yes
⑥	CW limit	Yes	No
⑦	CCW limit	Yes	No
⑧	Z phase	No	Yes
⑨	- - -	-	-
⑩	Machine lock	No	Yes
⑪	M-fin	No	Yes
⑫	- - -	-	-
⑬	Sign of correction value	(+)	(-)
⑭	MPG multiplication rate 100	No	Yes
⑮	MPG multiplication rate 10	No	Yes
⑯	MPG selection	No	Yes

(4) Display output signal (FUN 13)

Displays output signal condition from the positioner to the outside.
Displays are always renewed data.

Operation	Display	Explanation
FUN	FUN(??)	
↓		
1		
3	FUN(13) MON: OUTPUT-SIG	An initial condition of output signal display.
↓		
↓	MON: OUTPUT-SIG NO=0 0011 0010 0000 0000	First, displays condition of output No. = 0.
↓		
↓	MON: OUTPUT-SIG NO=0 0010 0001 0001 0010	Renewed value is displayed.
↓		
↓	MON: OUTPUT-SIG NO=1 1000 0000 0000 0000	Output signal No. is renewed and referred data is displayed.
↓		
↓	MON: OUTPUT-SIG NO=2 0000 0000 1101 0010	Output signal No. changes 0 → 1 → 2 → 0 sequentially with each press of [↓] key.
↓		
↑	MON: OUTPUT-SIG NO=1 1000 0000 0000 0000	Output signal No. changes 2 → 1 → 0 → 2 sequentially with each press of [↑] key.
↓		
FUN	FUN(??)	Ends display of input signal condition, and waiting for next selection of function.

Operation	Display	Explanation
	<div data-bbox="448 275 790 383" style="border: 1px solid black; padding: 5px;"> MON: OUTPUT-SIG NO=1 Exxx 0000 0000 0000 </div>	When an error occurs, its error code is displayed.
	<div data-bbox="448 421 790 528" style="border: 1px solid black; padding: 5px;"> Exxx ERROR MESSAGE </div>	The error code and error message appear.
<div data-bbox="240 600 395 674" style="border: 1px solid black; padding: 2px;"> CLR ↓ </div>	<div data-bbox="448 566 790 674" style="border: 1px solid black; padding: 5px;"> FUN(13) MON: OUTPUT-SIG </div>	Recover to initial display condition.

Condition of 0/1 of each input signal No. 0, 1, 2 means signal condition shown in the below chart:

MON: INPUT-SIG NO=X															
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯

No	N O = 0	Signal condition		No	N O = 2	Signal condition	
		0	1			0	1
①	- - -			①	Alarm LED display 7	None	Output
②	Alarm output	Out-put	None	②	Alarm LED display 6	None	Output
③	Zero output	None	Output	③	Alarm LED display 5	None	Output
④	Completion of program	None	Output	④	Alarm LED display 4	None	Output
⑤	Completion of temporary stop	None	Output	⑤	Alarm LED display 3	None	Output
⑥	Rough matching	None	Output	⑥	Alarm LED display 2	None	Output
⑦	Completion of positioning	None	Output	⑦	Alarm LED display 1	None	Output
⑧	M-code being output	None	Output	⑧	Alarm LED display 0	None	Output
⑨	- - -	None	Output	⑨	Power LED display	None	Output
⑩	- - -	None	Output	⑩	Auto LED display	None	Output
⑪	M-code output 6	None	Output	⑪	M-code LED display 6	None	Output
⑫	M-code output 5	None	Output	⑫	M-code LED display 5	None	Output
⑬	M-code output 4	None	Output	⑬	M-code LED display 4	None	Output
⑭	M-code output 3	None	Output	⑭	M-code LED display 3	None	Output
⑮	M-code output 2	None	Output	⑮	M-code LED display 2	None	Output
⑯	M-code output 1	None	Output	⑯	M-code LED display 1	None	Output

No	N O = 0	Signal condition	
		0	1
①	Output while operation	None	Output
②	V ref output	None	Output
③	- - -	None	Output
④	- - -	None	Output
⑤	Present position display strobe 4	None	Output
⑥	Present position display strobe 3	None	Output
⑦	Present position display strobe 2	None	Output
⑧	Present position display strobe 1	None	Output
⑨	Present position data 7	None	Output
⑩	Present position data 6	None	Output
⑪	Present position data 5	None	Output
⑫	Present position data 4	None	Output
⑬	Present position data 3	None	Output
⑭	Present position data 2	None	Output
⑮	Present position data 1	None	Output
⑯	Present position data 0	None	Output

(5) Display executing program (FUN 14)

Displays program number, block number, and G code of executing positioning by the positioner.

Operation	Display	Explanation
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">FUN(??)</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">1</div>		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">4</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">FUN(14) MON: PROGRAM</div>	An initial display condition of executing program.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">MON: PROGRAM P002 N127 G01</div>	Executing program number (P000-P019), block number (N00-N299), and G code appear on the LCD.
↓		
	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">MON: PROGRAM P002 N128 G12</div>	Renewed value is displayed.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">MON: PROGRAM P*** N*** G**</div>	When there is no executing program, *** appears.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">FUN(??)</div>	Ends display of input signal condition, and waiting for next selection of function.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">MON: PROGRAM ExxxP002 N145 G26</div>		When an error occurs, its error code is displayed.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">Exxx ERROR MESSAGE</div>	The error code and error message appear.
↓		
<div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">CLR</div>	<div style="border: 1px solid black; padding: 5px; width: 200px; margin: 0 auto;">FUN(14) MON: PROGRAM</div>	Recover to initial display condition.

- (6) Display operational condition or alarm condition (FUN 15)
 Displays operational condition or alarm condition. When an alarm occurs, operational condition cannot be displayed.

Operation	Display	Explanation
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN(??)</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">1</div>		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">5</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN(15) MON: STATUS</div>	An initial display condition of operational condition.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS WAIT POSITIONING CMD</div>	Operational condition is displayed.
↓	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS EX ONL ORIGIN-SEARCH DRIVE</div>	Renewed display automatically appears when condition changes.
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">FUN(??)</div>	Ends display of operational or alarm condition, and waits for next selection of function.
>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS A219 SOFT LIMIT OVER</div>	When an alarm occurs, the LCD automatically displays alarm condition.
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">→</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS A219 (CONT.-POSITIONING)</div>	[→] and [←] keys change display of first and second lines.
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">←</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS A219 SOFT LIMIT OVER</div>	
↓		
<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">↓</div>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 0 auto;">MON: STATUS WAIT POSITIONING CMD</div>	When the alarm condition is released, the LCD displays operational condition.

Operation	Display	Explanation
<pre> graph TD A[] --> B[FUN] B --> C[] C --> D[] D --> E[] E --> F[CLR] F --> G[] G --> H[] H --> I[] style A fill:none,stroke:none style C fill:none,stroke:none style D fill:none,stroke:none style E fill:none,stroke:none style G fill:none,stroke:none style H fill:none,stroke:none style I fill:none,stroke:none </pre>	<div data-bbox="456 286 786 398" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">FUN(??)</div> <div data-bbox="456 439 786 551" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">MON: STATUS EX ONL ExxxPOS.SET DRIVE</div> <div data-bbox="456 584 786 696" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Exxx ERROR MESSAGE</div> <div data-bbox="456 730 786 842" style="border: 1px solid black; padding: 5px;">FUN(15) MON: STATUS</div>	<p data-bbox="831 277 1270 376">Ends condition display and waiting for next selection of function.</p> <p data-bbox="831 461 1302 528">When an error occurs, its error code is displayed.</p> <p data-bbox="831 607 1318 674">The error code and error message appear on the LCD.</p> <p data-bbox="831 752 1238 819">Recovers to initial display condition.</p>

① Meaning of LCD display at operational condition display.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

MON: STATUS (a) (b) × (c) × ×
DETAIL STATUS

- (a) Blank; Machine lock OFF
M: Machine lock ON
- (b) x EX; Executing command by external signal.
- (c) xx SIG; Executing command by other than program
ONL; Executing program

Condition message are listed on the chart 3.3-1

② Meaning of LCD display at alarm condition display.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

MON: STATUS	A × × ×
ALARM MESSAGE	

Axxx; Indicates alarm code.

Alarm B: 101-109

Alarm C: 201-222

As for meaning of alarm message and measures, see item 4.1.

The table 3.3-1 Operational condition message list

Positioner condition (status message)		
No	LCD-MESSAGE	Explanation of condition
1	WAIT DRV-STANDBY ON	Waiting for turn on the ready operation command signal.
2	WAIT POSITIONING CMD	Waiting for the positioning command signal.
3	WAIT JOG/MPG	Waiting for the JOG or MPG operation command.
4	ORIGIN-SEARCH DRIVE	Executing zero search.
5	ORIGIN-SEARCH INPOS.	Waiting for in-position while in zero search.
6	ORIGIN-SEARCH HOLD	Temporary stop while in zero search.
7	ORIGIN-RETURN DRIVE	Executing zero return.
8	ORIGIN-RETURN INPOS.	Waiting for in-position while in zero return.
9	ORIGIN-RETURN HOLD	Temporary stop while in zero return.
10	ORIGIN-SHIFT DRIVE	Executing zero shift.
11	ORIGIN-SHIFT INPOS.	Waiting for in-position while in zero shift.
12	ORIGIN-SHIFT HOLD	Temporary stop while in zero shift.
13	WAIT JOG/MPG IN PROG	Waiting for the JOG or MPG operation command while in program operation.
14	JOG DRIVE	Executing JOG operation.
15	JOG INPOS.	Waiting for in-position while in JOG operation.
16	MPG DRIVE	Executing MPG operation.
17	MPG INPOS.	Waiting for in-position while MPG is in operation.
18	POS.SET DRIVE	Executing positioning.
19	POS.SET INPOS.	Waiting for in-position while in positioning.
20	POS.SET HOLD	Temporary stop while in positioning.
21	CONT.POS.SET DRIVE	Executing sequential positioning.
22	CONT.POS.SET INPOS.	Waiting for in-position while in sequential positioning.
23	CONT.POS.SET HOLD	Temporary stop while in sequential positioning.
24	EXT.POS.SET DRIVE	Executing external positioning.
25	EXT.POS.SET INPOS.	Waiting for in-position while in external positioning.
26	EXT.POS.SET HOLD	Temporary stop while in external positioning.
27	WAIT TIME UP	Dwelling.
28	WAIT M-FIN ON	Waiting for M-fin signal to be ON.
29	WAIT M-FIN OFF	Waiting for M-fine signal to be OFF.
30	PROGRAM INTERPRET	Checking program.

4.1 Alarm classification list

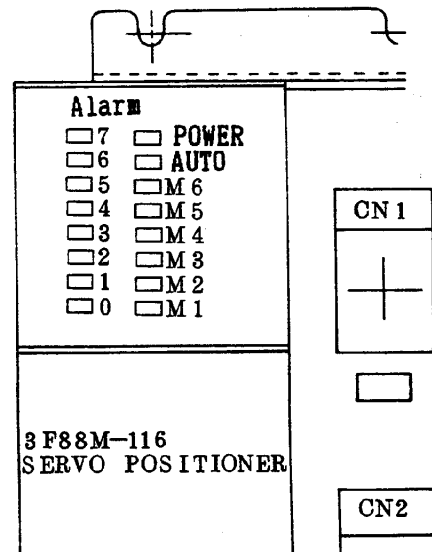
For your convenience, alarms are classified into four types as follows:

No	Alarm	Alarm code	Condition (in general)	LED
1	Alarm A	A000~ A009	Alarms which are unable to continue positioning function.	Flickers POWER LED every 250msec. and displays alarm code.
2	Alarm B	A100~ A119	Alarms which can be released by alarm reset input signals.	Flickers AUTO LED every 500msec. and displays alarm code.
3	Alarm C	A200~ A279	Alarms which does not necessarily require alarm reset input signals to recover.	Displays alarm code on the alarm LED.
4	Caution	A280~ A299	The positioner is in a condition not to accept position command signals.	Displays alarm code for one sec. on the alarm LED.

How to read
alarm code

	Alarm
8 0	<input type="checkbox"/> 7
4 0	<input type="checkbox"/> 6
2 0	<input type="checkbox"/> 5
1 0	<input type="checkbox"/> 4
8	<input type="checkbox"/> 3
4	<input type="checkbox"/> 2
2	<input type="checkbox"/> 1
1	<input type="checkbox"/> 0
↑	

Lower two digits
of alarm code is
shown as BCD.



(1) Alarm A

Alarm code	LEFT :ALARM MESSAGE	Causes	Treatment
	RIGHT :ALARM-MESSAGE		
A001	UNASSIGNED INTERRUPT	An interrupted unused vector (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A002	BUS ERROR	Buss error (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A003	ADDRESS ERROR	Address error (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A004	ILLEGAL INSTRUCTION	Incorrect command (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A005	ZERO DIVIDE	Divides by 0 (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A006	CHK INSTRUCTION	CHK command (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A007	TRAPV INSTRUCTION	TRAPV command (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A008	PRIVILEGE VIOLATION	Privilege command (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A009	TRACE	Trace (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A010	LINE 1010 EMULATOR	1010 Emulator (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A011	LINE 1111 EMULATOR	1111 Emulator (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A012 ~29	UNDEFINED	Not defined	
	UNDEFINED		
A030	WATCH-DOG TIMER INT.	WDT interrupt (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A031	ACIA TROUBLE	Abnormal transfer factor (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A032 ~39	UNDEFINED	Not defined.	
	UNDEFINED		
A040	TASK-LOOP ERROR	System program error (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A041	GATE-ARRAY 0 TROUBLE	Abnormal gate array 0 (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A042	GATE-ARRAY 1 TROUBLE	Abnormal gate array 1 (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A043	GATE-ARRAY 2 TROUBLE	Abnormal gate array 2 (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A044	EEPROM BUSY-LINE ERR	Abnormal EEPROM BUSY OFF (CPU trouble)	Replace to a new MDI.
	(CPU TROUBLE)		
A045	EEPROM WRITE-DISABLE	Incorrect writing of EEPROM (CPU trouble)	
	(CPU TROUBLE)		
A046	EEPROM NO-INITIALIZE	No designation of EEPROM ALL-INZ (misoperation)	Execute "MEMORY ALL CLEAR" by the MDI command at test mode.
	→TST:MEMORY CLR=ALL		

(2) Alarm B

Alarm code	LEFT :ALARM MESSAGE	Causes	Treatment
	RIGHT :ALARM-MESSAGE		
A101	EMERGENCY STOP	Emergency stop by the emergency stop input signal.	Release the emergency stop input signal, and turn the alarm reset OFF.
A102	MIS-WIRING	Abnormal condition of position loop wiring check. (No feedback while monitoring time [C10])	Remove causes and turn the alarm reset OFF.
A103	REVERSE-WIRING	Abnormal condition of position loop wiring check. (Reverse wiring)	Remove causes and turn the alarm reset OFF.
A104	SERVO ALARM	Servo alarm	Release servo alarm and turn the alarm reset OFF.
A105	P.F. AT WRITING PARA	Lines are disconnected while writing parameter to EEPROM.	Execute parameter check (FUN 04) by the MDI and turn the alarm reset OFF.
	→CHECK PARAMETER		
A106	P.F. AT WRITING PROG	Lines are disconnected while writing program to EEPROM.	Execute program check (FUN 04) by the MDI and turn the alarm reset OFF.
	→CHECK PROGRAM		
A107	P.F. AT WRITING DM	Lines are disconnected while writing data to EEPROM.	Execute data memory check (FUN 04) by the MDI and turn the alarm reset OFF.
	→CHECK DATA MEMORY		
A108	DISCONNECTION	Disconnection of a line.	Remove causes and turn the alarm reset OFF.
	P.F. AT EDITING PARA	Instantaneous power failure while editing parameter.	Execute parameter check (FUN04) by the MDI and turn the alarm reset OFF.
	→CHECK PARAMETER		

(3) Alarm C

Alarm code	LEFT :ALARM MESSAGE	Causes	Treatment
	RIGHT :ALARM-MESSAGE		
A201	SOFT LIMIT OVER	While the run command is OFF, operation exceeds the soft limit.	
	(AT DRV-STANDBY OFF)		
A202	+ SOFT LIMIT OVER	While positioning, operation exceeds positive software limit.	
	(AT POSITIONING)		
A203	- SOFT LIMIT OVER	While positioning, operation exceeds positive software limit.	
	(AT POSITIONING)		
A204	+ STROKE-END LS ON	Positive direction stroke limit is ON.	
A205	- STROKE-END LS ON	Negative direction stroke limit is ON.	
A206	BOTH STROKE-END ON	Zero position search error (both stroke limit LS are ON)	
	(AT ORIGIN-SEARCH)		
A207	ORG-DECEL LS CHATRNG	Zero position search error (chartering of zero deceleration limit LS)	
	(AT ORIGIN-DEARCH)		
A208	SPEED OVER	Abnormal speed	Check and revise speed data in parameter and program.
A209	COMMUNICATION ERROR	Data communication trouble	
A210	SOFT LIMIT OVER	Over the software limit while single positioning.	Check and revise program.
	(SINGLE-POSITIONING)		
A211	NO ORIGIN-SIGNAL	While in zero search mode ([C39]=1), no zero deceleration LS or no Z phase input until the stroke limit LS.	
	(AT ORIGIN-SEARCH)		
A212	NO PARAMETER CHECK →CHECK PARAMETER	Not completed parameter check.	Execute parameter check by the MDI.
A213	NO PROGRAM CHECK →CHECK PROGRAM	Not completed program check	Execute program check by the MDI.
A214	NO DATA MEN CHECK →CHECK DATA MEMORY	Not completed data memory check.	Execute program check by the MDI.
A215	PROGRAM NO. ERROR	Program number error. (no designated program)	Confirm the designated program.
A216	SUBROUTINE NEST OVER	Sub-routine nest (more than five times)	Confirm and revise program.
A217	UNDEFINED		
	UNDEFINED		

Alarm code	LEFT :ALARM MESSAGE	Causes	Treatment
	RIGHT :ALARM-MESSAGE		
A218	NO RETURN BLOCK	Sub-routine is incorrectly used.	Confirm and revise program.
A219	SOFT LIMIT OVER	Over the software limit while in sequential positioning.	Confirm and revise program.
	(CONT.-POSITIONING)		
A220	LITTLE POS. DATA	Unable to sequence positioning due to data having lots of small feed length.	Confirm and revise program.
	(CONT.-POSITIONING)		
A221	INPOSITION TIME OVER	Too much time to get in-position in range (more than 5 sec.)	
A222	PROGRAM NO. NOT BCD	Program number is not at BCD format while inputting program start command signal input	Confirm and revise program.

(4) Cautions

Alarm code	LEFT :ALARM MESSAGE	Causes	Treatment
	RIGHT :ALARM-MESSAGE		
A280	MULTI SIGNAL ON	Simultaneous occurrence of more than two positioning commands. (at the completion of positioning)	
A281	OTHER SIGNAL ON	Other positioning command signal is ON while sending a new positioning command. (at the completion of positioning)	
A282	NO ORG-SEARCH MODE	While there is no zero search operation ([C39]=2), zero search operation occurs.	
A283	MANUAL SELECT OFF	While JOG command, manual selection is OFF. (at the completion of positioning)	
A284	NON-CMD WAIT STATUS	While the positioner is not in a condition to receive positioning command, positioning command signal is ON.	
A285	MPG SELECTED	While sending positioning command, both manual mode and MPG selection signal are ON. (at MPG positioning)	
A286	DRV-STANDBY SIG OFF	While operation ready command is OFF, positioning command is supplied.	

5.1 Specifications of MDI

(1) Communication specifications

No	Items	Discription
1	Electrical characteristics	EIA RS-422 or equivalent
2	Transfer connection	Multi-drop
3	Communication system	Four lines, half-duplex operation
4	Synchronization system	Start-stop system
5	Transfer code	7 bits + 2 bits, ASCII 7 units
6	Transfer speed	9600BPS fixed
7	Allowable length of transfer cable	10m max.

(2) General specifications

No	Items	Discription
1	Power voltage	12VDC supplied from the positioner
2	Allowable power voltage fluctuation	9.6V ~ 14.4VDC
3	Consumed power	3W max.
4	Voltage proof	Between DC external terminal and the case, one minute with 500VAC 50/60Hz.
5	Vibration proof	JIS C 0911 II B item 3 16.7Hz 30 minutes for each X, Y, Z direction with 3mm width.
6	Shock proof	JIS C 0912 or equivalent 10G three times for each X, Y, Z direction.
7	Operational environmental temperature	0 to 55°C
8	Operational environmental humidity	35 to 85%RH (without dew condensation)
9	Storage temperature	-20 to +65°C
10	Storage humidity	35 to 85%RH (without dew condensation)
11	Operational environmental atmosphere	Without corrosive gas
12	Enclosed structure	IP-30
13	Weight	2kg or less
14	Painting color	5Y7/1
15	Outside dimension	190 (H) x 105 (W) x 37.5 (D)

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