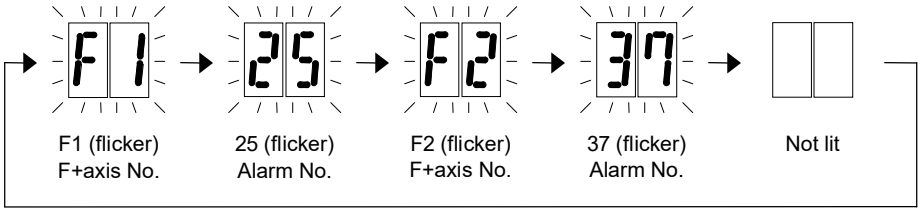
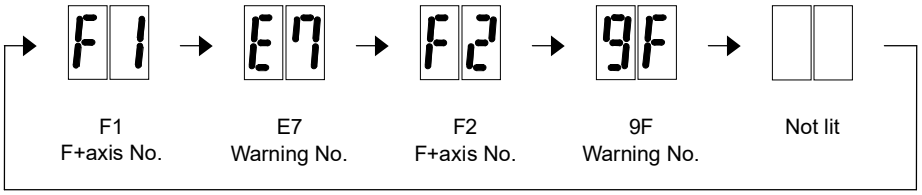
6-1-1 LED display when alarm or warning occurs

(1) Servo and spindle drive unit

The axis No. and alarm/warning No. alternate on the display. The display flickers when an alarm occurs.



LED display during servo alarm or spindle alarm



LED display during servo warning or spindle warning

Numbers displayed on LED

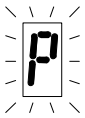
No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LED display	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F

(2) Power supply unit

The alarm/warning No. is converted into a symbol and displayed. Refer to section "6-2-1 List of alarms" and "6-2-2 List of warnings" for details. The display flickers when an alarm or a warning occurs.

Alarm 71 (flicker)

LED display during power supply alarm



Warning E9 (flicker)

LED display during power supply warning

6-2 Protective functions list of units

6-2-1 List of alarms

When an alarm occurs, the servo drive unit will make the motor stop by the deceleration control or dynamic brake. The spindle drive unit will coast to a stop or will decelerate to a stop. At the same time, the alarm No. will appear on the NC monitor screen and with the LEDs on the front of the drive unit. Check the alarm No., and remove the cause of the alarm by following this list.

Drive unit alarm

No.	Alarm name	SV	SP	Alarm details	Reset
11	Axis selection error	■		The axis No. selection switch setting is incorrect.	AR
12	Memory error 1	■	■	A CPU or internal memory error was detected during the self-check at power ON.	AR
13	Software processing error 1	●	●	The software process was not completed within the specified time. (CPU1)	PR
14	Software processing error 2	○		The software process was not completed within the specified time. (CPU2)	PR
16	Magnetic pole position detection error		■	Creation of the initial magnetic pole, required for motor control, was not completed.	PR
17	A/D converter error	■	■	An error was detected in the A/D converter for current FB detection.	PR
18	Motor side detector, initial communication error	■		Initial communication with the motor end detector was not possible.	PR
19	Synchronous control/detector communication error	●		Initial communication with the master axis motor end detector was not possible when the closed current command synchronous control was set. Or, the communication was cut off.	PR
1A	Machine side detector, initial communication error	■		Initial communication with the linear scale or ball screw end detector was not possible.	PR
1B	Machine side detector, CPU error 1	■		A CPU initial error was detected with the linear scale or ball screw end detector.	PR
1C	Machine side detector, EEPROM/LED abnormality	●		An error was detected in the data stored in the memory with the linear scale. Or, LED deterioration was detected with the linear scale.	PR
1D	Machine side detector, data error	●		A data error was detected with the linear scale or ball screw end detector.	PR
1E	Machine side detector, memory error	●		An internal memory error was detected with the linear scale.	PR
1F	Machine side detector, communication error	●		An error was detected in the communication data with the linear scale or ball screw end detector. Or, the communication was cut off.	PR

(Note 1) Motor stopping method applied when self-axis drive unit alarm occurs is indicated in SV for servo and in SP for spindle.
(Note 2) Servo (SV) alarm stopping method
○: Deceleration control (when SV048, SV055 or SV056 is set)
●: Dynamic brake stop
■: Initial error (while motor is stopped)
(Note 3) Spindle (SP) alarm stopping method
○: Deceleration control (when SP038/bit0=1 is set)
●: Coast to a stop
■: Initial error (while motor is stopped)

Resetting methods

NR : Reset with the NC RESET button. This alarm can also be reset with the PR and AR resetting conditions.
PR : Reset by turning the NC power ON again. This alarm can also be reset with the AR resetting conditions.
When the control axis is removed, this alarm can be reset with the NC RESET button. (Excluding alarms 32 and 37.)
AR : Reset by turning the servo drive unit power ON again.

Drive unit alarm

No.	Alarm name	SV	SP	Alarm details	Reset
20	Motor side detector, No signal 1	／	○	A PLG Z-phase no signal was detected.	PR
21	Machine side detector, No signal 2	●	○	The pulse-type linear scale or ball screw end detector's ABZ-phase no signal was detected with the servo, or the encoder no-signal was detected with the spindle.	PR
23	Excessive speed deflection 1		●	A difference of 50r/min or more between the speed command and speed feedback continued for longer than the set time.	PR
25	Absolute position lost	■	／	The backup voltage in the absolute position detector dropped causing the absolute position to be lost.	AR
26	Unusable axis error	■	／	A power module error is occurring with the axis for which the axis No. selection switch is set to "F" (not used axis).	PR
27	Machine side detector, CPU error 2	●	／	A CPU error was detected with the linear scale.	PR
28	Machine side detector, overspeed	●	／	A speed exceeding the specified maximum speed was detected with the linear scale.	PR
29	Machine side detector, absolute position data error	●	／	An error was detected in the absolute position data detection circuit with the linear scale.	PR
2A	Machine side detector, incremental position data error	●	／	An error was detected in the relative position data detection circuit with the linear scale.	PR
2B	Motor side detector, CPU error 1	■	／	A CPU initial error was detected with the motor end detector or linear scale in the linear servo system.	PR
2C	Motor side detector, EEPROM/LED error	●	／	Deterioration of the LEDs was detected with the motor end detector. Or, an error in the data stored in the memory was detected with the linear scale in the linear servo system.	PR
2D	Motor side detector, data error	●	／	A data error was detected with the motor end detector or linear scale in the linear servo system.	PR
2F	Motor side detector, communication error	●	／	A communication data error was detected with the motor end detector or linear scale for the linear servo. Or, communication was cut off.	PR
31	Overspeed	○	●	A rotation speed exceeding the motor's tolerable rotation speed was detected.	PR
32	Power module overcurrent	●	●	The power module's overcurrent protection function activated.	PR
34	Communication or CRC error between NC and drive unit	○	○	An error was detected in the data received from the NC.	PR
35	NC command error	○	○	The movement command data received from the NC was excessive.	PR
36	Communication or transmission error between NC and drive unit	○	○	Communication from the NC was cut off.	PR
37	Initial parameter error	■	■	An illegal parameter was detected in the parameters received from the NC at NC power ON.	PR
38	Communication or protocol error 1 between NC and drive unit	○	○	An error was detected in the communication frame received from the NC.	PR
39	Communication or protocol error 2 between NC and drive unit	○	○	An error was detected in the axis information data received from the NC.	PR
3A	Overcurrent	●	●	An excessive current was detected in the motor drive current.	PR
3B	Power module overheat	●	●	The power module's temperature protection function activated.	PR
3D	Spindle speed lock	／	●	Even when the maximum torque was commanded, the motor speed does not increase to 45r/min or more.	PR
3E	Spindle speed overrun	／	●	1. A state in which the motor's speed feedback exceeded the speed command and accelerated was detected. 2. Even though the speed command is 0 (including when stopped during position control), motor rotation exceeding the parameter setting value was detected.	PR
3F	Speed excessive deflection 2	／	●	During constant speed operation, the difference between the speed command and speed feedback exceeded the set amount and set time.	PR

(Note 1) Motor stopping method applied when self-axis drive unit alarm occurs is indicated in SV for servo and in SP for spindle.
(Note 2) Servo (SV) alarm stopping method
○: Deceleration control (when SV048, SV055 or SV056 is set)
●: Dynamic brake stop
■: Initial error (while motor is stopped)
(Note 3) Spindle (SP) alarm stopping method
○: Deceleration control (when SP038/bit0=1 is set)
●: Coast to a stop
■: Initial error (while motor is stopped)

Drive unit alarm

No.	Alarm name	SV	SP	Alarm details	Reset
40	Detector changeover unit, changeover error	/	●	During 1-drive unit 2-motor control, an error was detected in the motor changeover signal received form the detector changeover unit.	PR
41	Detector changeover unit, communication error	/	●	During 1-drive unit 2-motor control, an error was detected in the communication with the detector changeover unit.	PR
42	Feedback error 1	●	●	With the servo, pulse-type position detector feedback signal error was detected. With the spindle, a PLG feedback signal error was detected.	PR
43	Feedback error 2	●	●	With the servo, an excessive error was detected in the position data for the motor side detector and machine side detector. With the spindle, an error was detected in the encoder feedback signal.	PR
44	C-axis changeover alarm	/	●	When using the coil changeover control motor, the mode was changed to C-axis control while the high-speed coil was selected.	NR
46	Motor overheat	○	○	The temperature protection function in the motor or detector activated.	NR
4E	NC command mode error		●	A spindle control mode selection exceeding the specifications was input.	NR
50	Overload 1	○	●	The overload detection level reached 100% or more. The motor or drive unit is in the overload state.	NR
51	Overload 2	●	●	With the servo, a current command exceeding 95% of the unit's maximum current continued for one second or more. With the spindle, a load exceeding the continuous rating continued for 30 minutes or more.	NR
52	Excessive error 1	○	○	With the servo, the difference of the motor's actual position at servo ON and the theoretical position exceeded the setting value. With the spindle, the difference of the position command and position feedback exceeded the setting value.	NR
53	Excessive error 2	●	/	The difference of the motor's actual position at servo OFF and the theoretical position exceeded the setting value.	NR
54	Excessive error 3	○	/	The motor current was not detected when the excessive error 1 alarm occurred.	NR
58	Collision detection 1 G0	○	/	When the collision detection function is valid, the disturbance torque exceeded the collision detection value during rapid traverse (G0).	NR
59	Collision detection 1 G1	○	/	When the collision detection function is valid, the disturbance torque exceeded the collision detection level during cutting feed (G1).	NR
5A	Collision detection 2	○	/	When the collision detection function is valid, the command torque reached the motor's maximum torque.	NR
5C	Orientation feedback error	/	●	After orientation was completed, the command and feedback error exceeded the parameter setting.	PR

(Note 1) Motor stopping method applied when self-axis drive unit alarm occurs is indicated in SV for servo and in SP for spindle.
(Note 2) Servo (SV) alarm stopping method
○: Deceleration control (when SV048, SV055 or SV056 is set)
●: Dynamic brake stop
■: Initial error (while motor is stopped)
(Note 3) Spindle (SP) alarm stopping method
○: Deceleration control (when SP038/bit0=1 is set)
●: Coast to a stop
■: Initial error (while motor is stopped)

Power supply alarm

No.	LED display	Alarm name	CV	CR	Alarm details	Reset
60		Instantaneous power failure	●	●	A drop in the 24VDC power was detected.	PR
61		Power module overcurrent	●	●	The power module's overcurrent protection function activated.	PR
62		Frequency error	●	●	The input power frequency exceeded the specified range.	PR
63		Auxiliary regeneration error	●	●	The auxiliary regenerative transistor is still ON.	PR
65		Rush relay error	●	●	The rush resistance short-circuit relay does not turn ON.	PR
67		Phase failure	●	●	There is a phase failure in the input power.	PR
68		Watch dog	●	●	The system is not operating normally.	AR
69		Ground fault	●	●	The motor power cable is contacting FG (ground).	PR
6A		External contactor melting	●	●	The external contactor's contact has melted.	PR
6B		Rush relay melted	●	●	The rush resistance short-circuit relay does not turn OFF.	PR
6C		Main circuit error	●	●	An abnormality was detected in the main circuit capacitor's charging operation.	PR
6D		Parameter error	●	●	The power supply unit's capacity is not appropriate for the regenerative resistor type set with the parameters.	PR
6E		Memory error	●	●	An error was detected in the internal memory.	AR
6F		Power supply error	●	●	The power supply is not connected, or an error was detected in the power supply's A/D converter. This is detected simultaneously if another power supply alarm occurs.	AR
71		Instantaneous power failure/ external emergency stop	●	●	An instantaneous power failure occurred.	NR
73		Over-regeneration	●	●	The over-regeneration detection level exceeded 100%. The regenerative resistor is in the overload state.	PR
74		Regenerative resistor overheat	●	●	The temperature protection function in the regenerative resistor activated.	PR
75		Overvoltage	●	●	The main circuit PN bus voltage exceeded the tolerable value.	NR
76		External emergency stop setting error	●	●	The rotary switch setting for the external emergency stop does not match the parameter setting.	AR
77		Power module overheat	●	●	The power module's temperature protection function activated.	AR

(Note 1) If a power supply alarm (60 to 77) occurs, all servos will stop with the dynamic brakes, and all spindles will be stop with the coast to a stop.

(Note 2) "b", "C" and "d" displayed on the power supply unit's LED as a solid light (not flickering) do not indicate an alarm.

Drive unit alarm

No.	Alarm name	SV	SP	Alarm details	Reset
7F	Power reboot request	■		A mismatch in the program mode selection was detected. Turn the drive unit power ON again.	PR
88	Watch dog	●	●	The system is not operating normally.	AR
89	Detector converter unit 2 connection error	●	●	With the servo, an error was detected in the connection with the analog output linear scale for the MDS-B-HR unit. With the spindle, initial communication with the MDS-B-PJEX was not possible.	PR
8A	Encoder converter unit 2 communication error	●	●	With the servo, an error was detected in the communication with the serial output linear scale for the MDS-B-HR unit. With the spindle, an error was detected in the communication with the MDS-B-PJEX.	PR
8B	Encoder converter unit 2 automatic adjustment error		●	An abnormal signal from the PLG was detected during automatic adjustment of the PLG.	PR
8C	Encoder converter unit 2 judgment error		●	A detector type not within the specifications was detected with the MDS-B-PJEX.	PR
8D	Encoder converter unit 2 CPU error	●	●	With the servo, a CPU error was detected with the MDS-B-HR unit. With the spindle, a CPU error was detected with the MDS-B-PJEX unit.	AR
8E	Encoder converter unit 2 data error	●		A data error was detected with the MDS-B-HR unit.	PR

(Note 1) Motor stopping method applied when self-axis drive unit alarm occurs is indicated in SV for servo and in SP for spindle.
(Note 2) Servo (SV) alarm stopping method
○: Deceleration control (when SV048, SV055 or SV056 is set)
●: Dynamic brake stop
■: Initial error (while motor is stopped)
(Note 3) Spindle (SP) alarm stopping method
○: Deceleration control (when SP038/bit0=1 is set)
●: Coast to a stop
■: Initial error (while motor is stopped)

6-2-2 List of warnings

When a warning occurs, a warning No. will appear on the NC monitor screen and with the LEDs on the front of the drive unit. Check the warning No., and remove the cause of the warning by following this list.

Drive unit warnings

No.	Alarm name	Warning details	Reset
90	Detector, initial communication error	Initial communication with the absolute position linear scale was not possible.	PR
91	Detector, communication error	An error was detected in the communication with the detector for the absolute position detection system.	*
92	Detector, protocol error	An error was detected in the data for the absolute position detection system.	*
93	Initial absolute position fluctuation	The position data fluctuated when creating the initial absolute position.	PR
96	MP scale feedback error	An excessive deviation was detected in the motor end detector and MP scale feedback data for the MP scale absolute position detection system.	*
97	MP scale offset error	An error was detected in the offset data received from the MP scale for the MP scale absolute position detection system.	PR
9E	Absolute position detector, multi-rotation counter error	An error was detected in the multi-rotation counter for the absolute position detector. The absolute position cannot be compensated.	*
9F	Battery voltage drop	The voltage of the battery supplying to the absolute position detector has dropped. The absolute position data is held.	*
A8	Turret indexing error warning	The commanded turret indexing position shift amount is not within the specified range.	*
A9	Orientation feedback error warn	Retrying during an orientation feedback error.	*
E1	Overload warning	The overload detection level is 80% or more.	*
E3	Absolute position counter warning	A deviation was detected in the absolute position data and absolute position data.	*
E4	Parameter error warning	A parameter exceeding the setting range was set.	*
E6	Control axis removal warning	Control axis removal was commanded.	*
E7	CNC emergency stop	Emergency stop was input from the NC.	*

(Note 1) Servo and spindle motor do not stop when the warning occurs.
(Note 2) When an emergency stop is input, servo and spindle motor decelerate to a stop.
(When SV048, SV055 or SV056 is set for servo and when SP038/bit 0=1is set.)

Power supply warnings

No.	LED display	Alarm name	CV	CR	Warning details	Reset
E8		Auxiliary regeneration frequency over		○	Regeneration at the power supply performance limit is occurring frequently.	*
E9		Instantaneous power failure warning	○		An instantaneous power failure occurred.	NR
EA		External emergency stop	○		The external emergency stop signal was input.	*
EB		Over-regeneration warning	○		The over-regeneration level is 80% or more.	*

(Note) Servo and spindle motor do not stop when the warning occurs.

Resetting methods

* : Automatically reset once the cause of the warning is removed.
NR : Reset with the NC RESET button. This warning can also be reset with the PR and AR resetting conditions.
PR : Reset by turning the NC power ON again. This warning can also be reset with the AR resetting conditions.
When the control axis is removed, this warning can be reset with the NC RESET button. (Excluding warning 93.)

6-3 Troubleshooting

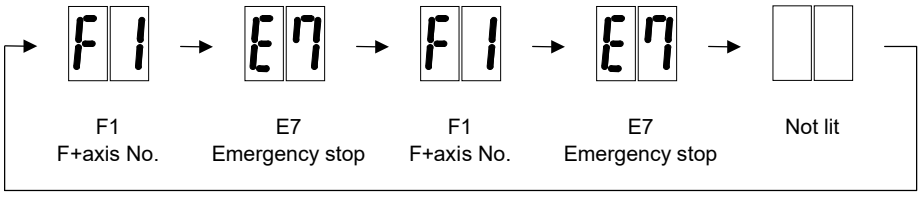
Follow this section to troubleshoot the alarms that occur during start up or while the machine is operating. If the state is not improved with the following investigations, the drive unit may be faulty. Exchange the unit with another unit of the same capacity, and check whether the state is improved.

6-3-1 Troubleshooting at power ON

If the NC system does not start up correctly and a system error occurs when the NC power is turned ON, the drive unit may not have been started up properly. Check the LED display on the drive unit, and take measures according to this section.

LED display	Symptom	Cause of occurrence	Investigation method	Remedy
AA	Initial communication with the CNC was not completed correctly.	The drive unit axis No. setting is incorrect.	Is there any other drive unit that has the same axis No. set?	Set correctly.
		The CNC setting is incorrect.	Is the No. of CNC controlled axes correct?	Set correctly.
		Communication with CNC is incorrect.	Is the connector (CN1A, CN1B) disconnected?	Connect correctly.
			Is the cable broken? Check the conductivity with a tester.	Replace the cable.
Ab	Initial communication with the CNC was not carried out.	The axis is not used, the setting is for use inhibiting.	Is the axis setting rotary switch set to "7" to "F"?	Set correctly.
		Communication with CNC is incorrect.	Is the connector (CN1A, CN1B) disconnected?	Connect correctly.
			Is the cable broken? Check the conductivity with a tester	Replace the cable.
12	An error was detected in the unit's memory and IC during the self-diagnosis at power ON.	The CPU peripheral circuit is abnormal.	Check the repeatability.	Replace the unit.
			Check whether there is any abnormality with the unit's surrounding environment, etc.	Improve the surrounding environment.

The drive unit has started up normally if the following type of emergency stop (E7) is displayed on the display unit's LED display.



Normal drive unit LED display at NC power ON (for 1st axis)

6-3-2 Troubleshooting for each alarm No.

Alarm No. 11	Axis selection error The axis No. selection switch setting is incorrect.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the setting of the axis selection switch on the top of the unit.	The same axis No. is set for the L and M axes.	Correctly set the axis No. 0 = No. 1 axis, 1 = No. 2 axis, ...	○	

Alarm No. 12	Memory error 1 A CPU or internal memory error was detected during the self-check at power ON.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Refer to "6-3-1 Troubleshooting at power ON".			○	○

Alarm No. 13	Software processing error 1 The software process was not completed within the specified time. (CPU1)				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the servo software version was changed recently.	The version was changed.	Try replacing with the drive unit containing the original software version.	○	○
		The version was not changed.	Investigate item 2.		
2	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Investigate item 3.		
3	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 14	Software processing error 2 The software process was not completed within the specified time. (CPU2)				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Carry out the items for alarm No. 13.			○	○

Alarm No. 16	Magnetic pole position detection error Creation of the initial magnetic pole, required for motor control, was not completed.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Was the spindle drive unit replaced?	It was replaced.	Carry out automatic adjustment of the PLG Z-phase.		○
		It was not replaced.	Investigate item 2.		
2	Check the spindle parameters.	SP205 = 0	Carry out automatic adjustment of the PLG Z-phase.		
		SP205 = 1	Set SP205 to 0, and turn the NC power ON again. Then, carry out automatic adjustment of the PLG Z-phase.		○

Alarm No. 17	A/D converter error An error was detected in the A/D converter for current FB detection.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the repeatability.	The error is always repeated.	Replace the drive unit.	○	○
		The state returns to normal once, but occurs sometimes thereafter.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 18	Motor side detector, initial communication error Initial communication with the motor end detector was not possible.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the servo parameter (SV025) setting value. OSE104: 0, OSA104: 1 Are all other set to 2? (Excluding slave axis for synchronous control)	The value is not set correctly.	Correctly set SV025.	○	
		The value is set correctly.	Investigate item 2.		
2	Check whether the drive unit connectors (CN2) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 3.		
3	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 4.		
4	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 5.		
5	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 19	Synchronous control/detector communication error Initial communication with the master axis motor end detector was not possible when the closed current command synchronous control was set. Or, the communication was cut off.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the MDS-B-SD unit CN2B connector is disconnected.	The connector is disconnected.	Correctly connect.	○	
		The connector is not disconnected.	Investigate item 2.		
2	Check the continuity of the cable between the MDS-B-SD unit CN2B and the slave side drive unit CN3.	The cable is disconnected or incorrectly connected.	Replace the cable.	○	
		There is no abnormality in particular.	Try replacing the drive unit or MDS-B-SD unit.		

Alarm No. 1A	Machine side detector, initial communication error Initial communication with the linear scale or ball screw end detector was not possible.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the servo parameter (SV025.pen) setting value. Are the serial communication parameters set for the pulse-type detector?	The value is not set correctly.	Correctly set SV025.	○	
		The value is set correctly.	Investigate item 2.		
2	Check whether the drive unit connectors (CN3) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 3.		
3	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 4.		
4	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 5.		
5	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 1B	Machine side detector, CPU error 1 A CPU initial error was detected with the linear scale or ball screw end detector.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or scale side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 2.		
2	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 1C	Machine side detector, EEPROM/LED abnormality An error was detected in the data stored in the memory by the linear scale. Or, LED deterioration was detected with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 1D	Machine side detector, data error A data error was detected with the linear scale or ball screw end detector.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 1E	Machine side detector, memory error An internal memory error was detected with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 1F	Machine side detector, communication error An error was detected in the communication data with the linear scale or ball screw end detector. Or, the communication was cut off.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the drive unit connectors (CN3) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Investigate item 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Ground the motor to one point, connecting the wires together on the drive unit side.	○	
		The motor is grounded to one point.	Investigate item 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 5.		
5	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 6.		
6	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	

Alarm No. 20	Motor side detector, No signal 1 A PLG Z-phase no signal was detected. An error was detected in the A/B phase output waveform during PLG automatic adjustment.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the drive unit connectors (CN5) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.		○
		The connector is not disconnected.	Investigate item 2.		
2	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.		○
		The connection is normal.	Investigate item 3.		
3	Check whether the alarm occurred during PLG automatic adjustment.	The alarm occurred during PLG automatic adjustment.	Investigate item 4.		○
		The alarm occurred during normal operation.	Investigate item 5.		
4	Check the PLG output waveform (A/B phase).	There is a problem. (The A/B phase input voltage is 0.8V or less or 2.2V or higher.)	Adjust the PLG output waveform.		○
		Normal	Investigate item 6.		
5	Check the PLG output waveform (Z-phase).	There is a problem. (The output waveform is 0V even after the gears' Z-phase is passed.)	Investigate item 7.		○
		Normal	Investigate item 6.		
6	Check the occurrence frequency.	Occurs each time.	Replace the drive unit.		○
		Occurs occasionally.	Check whether the cable is disconnected, whether there is a contact fault, or a detector fault.		
7	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the PLG detector.		○
		An abnormality was found in the ambient environment.	Take measures according to the error cause. Cable disconnection, contact fault. The sensor is hot during high-load operation. Review the operation, and adjust the Z-phase again.		

Alarm No. 21	Machine side detector, No signal 2 The pulse-type linear scale or ball screw end detector's ABZ-phase no signal was detected with the servo, or the encoder no-signal was detected with the spindle.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the servo parameter (SV025. pen) setting value. Are the pulse-type detector parameters set for a serial communication type detector?	The value is not set correctly.	Correctly set SV025.	○	
		The value is set correctly.	Investigate item 3.		
2	Check the spindle parameter (SP037/bit0) settings.	Encoder orientation is not used.	Set SP037/bit0 to 0.		○
		Encoder orientation is used.	Investigate item 3.		
3	Check whether the drive unit connectors (servo: CN3, spindle: CN6) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Investigate item 4.		
4	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.	○	○
		The connection is normal.	Investigate item 5.		
5	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Investigate item 6.		
6	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 23	Excessive speed deflection 1 A difference of 50r/min or more between the speed command and speed feedback continued for longer than the set time.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the U, V and W wiring between the spindle drive unit and spindle motor.	The wires are not correctly connected.	Correctly connect.		○
		The wires are correctly connected.	Investigate item 2.		
2	Check the settings for SP034, SP040, SP055, and SP257 to SP384.	The correct values are not set.	Correctly set.		○
		The correct values are set.	Investigate item 3.		
3	Measure the acceleration/ deceleration time constants. Measure the time required to reach the reverse run maximum speed from the forward run maximum speed.	12 seconds or more.	Increase the SP055 setting value.		○
		Less than 12 seconds.	Investigate item 4.		
4	Measure the load during cutting.	120% or more.	Reduce the load.		○
		Less than 120%.	Investigate item 5.		
5	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal.	Replace the drive unit.		

Alarm No. 25	Absolute position lost The backup voltage in the absolute position detector dropped causing the absolute position to be lost.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Is warning 9F occurring at the same time?	The warning is occurring.	Investigate item 2.	○	
		The warning is not occurring.	Investigate item 3.		
2	Measure the battery voltage with a tester.	3V or less.	Replace the battery, and establish the zero point.	○	
		3V or more.	Check the NC bus cable connection.		
3	Did alarm 18 occur when the power was turned ON the last time?	Alarm 18 occurred.	Turn the drive unit control power ON again, and establish the zero point.	○	
		Alarm 18 did not occur.	Investigate item 4.		
4	Was the detector cable or battery cable disconnected from the unit for a long time?	The unit was left for a long time. Guide at delivery : 20 hours or more After 5 years : 10 hours or more	Turn the drive unit control power ON again, and establish the zero point.	○	
		The cables were not disconnected.	Investigate item 5.		
5	Check the detector cable or battery cable connection with a tester.	The connection is faulty.	Replace the cable.	○	
		The connection is normal.	Replace the drive unit.		

Alarm No. 26	Unusable axis error A power module error is occurring with the axis for which the axis No. selection switch is set to "F" (not used axis).				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 27	Machine side detector, CPU error 2 A CPU error was detected with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 28	Machine side detector, overspeed A speed exceeding the specified maximum speed was detected with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the linear scale's maximum speed.	The rapid traverse rate is higher than the specified value.	Use within the specified range.	○	
		The rapid traverse rate is less than the specified value.	Investigate item 2.		
2	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the linear scale.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 29	Machine side detector, absolute position data error An error was detected in the absolute position data detection circuit with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 2A	Machine side detector, incremental position data error An error was detected in the relative position data detection circuit with the linear scale.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "1B" items.			○	

Alarm No. 2B	Motor side detector, CPU error 1 A CPU initial error was detected with the motor end detector.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 2C	Motor side detector, EEPROM/LED error Deterioration of the LEDs was detected with the motor end detector.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check the alarm No. "2B" items.			○	

Alarm No. 2D	Motor side detector, data error A data error was detected with the motor end detector.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check the alarm No. "2B" items.			○	

Alarm No. 2F	Motor side detector, communication error A communication data error was detected with the motor end detector. Or, communication was cut off.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check whether the drive unit connectors (CN2) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Investigate item 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Connect together on the drive unit side.	○	
		The motor is grounded to one point.	Investigate item 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 5.		
5	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 6.		
6	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 31	Overspeed A rotation speed exceeding the motor's tolerable rotation speed was detected.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the rapid traverse rate (rapid) and motor maximum rotation speed.	The rapid traverse rate is too fast.	Set within the motor's maximum rotation speed.	○	
		The speed is within the motor's maximum rotation speed.	Investigate item 2.		
2	Check the settings for the servo parameters SV001 (PC1), SV002 (PC2), SV018 (PIT) and SV025 (MTYP).	The settings are incorrect.	Correctly set.	○	
		Correctly set.	Investigate item 5.		
3	Confirm the spindle parameter SP017 (TSP) setting.	The setting is incorrect. The alarm is detected at 115% of SP017.	Correctly set.		○
		Correctly set.	Investigate item 4.		
4	Confirm the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal.	Investigate item 5.		
5	Check whether the speed waveform is overshooting.	The waveform is overshooting.	Increase the acceleration/ deceleration time constant.		
		The waveform is not overshooting.	Check if there is any abnormality in the unit's ambient environment. (Ex.: Ambient temperature, noise, grounding)	○	○

Alarm No. 32	Power module overcurrent The power module's overcurrent protection function activated.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the repeatability.	The alarm occurs before READY ON. (The drive unit is faulty.)	Check investigation item 2 and following, and remove the cause of the fault. Then replace the drive unit.	○	○
		The alarm occurs after READY ON.	Investigate item 2.		
2	Check the parameter setting. • Motor type	The setting is incorrect. Servo : SV025 Spindle : SP034, SP040, SP257 to SP384	Correctly set.	○	○
		The setting is correct.	Investigate item 3.		
3	Check the parameter settings. • Current loop gain • Speed loop gain	The setting is large compared to the standard value.	Set the standard value.	○	○
		The standard value is set.	Investigate item 4.		
4	Disconnect the UVW phase wiring from the terminal block, and the cannon plug from the motor. Check the insulation with a tester.	The power cable is short-circuited.	Replace the motor's power cable.	○	○
		There is no problem.	Investigate item 5.		
5	Check the insulation between the motor power cable and FG.	The power cable is short-circuited.	Replace the motor's power cable.	○	○
		There is no problem.	Investigate item 6.		
6	Connect the cannon plug, and check the insulation between the power cable and FG.	The motor is short-circuited.	Replace the motor. (With the absolute position system, the zero point must be established.)	○	○
		There is no problem.	Investigate item 7.		
7	Check for any abnormalities in the motor's ambient environment. (Ex.: Ambient temperature, cutting water)	No abnormality is found in particular.	Replace the drive unit.		
		An abnormality was found in the ambient environment.	Replace the motor and improve the motor installation environment. (With the absolute position system, the zero point must be established.)	○	○

Alarm No. 34	Communication or CRC error between NC and drive unit An error was detected in the data received from the NC.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Try replacing the terminator or battery unit.	The state is improved.	Replace the cause of the fault.	○	○
		The state is not improved.	Investigate item 2.		
2	Check the NC bus communication cable connection. • Is the cable disconnected? • Is the communication pair cable connected in reverse?	The connection is incorrect.	Replace the cable.	○	○
		There is no problem.	Investigate item 3.		
3	Change the order of the connected drive units. (The rotary switch does not need to be changed.)	The alarm is on the cable connections.	Replace the cable.	○	○
		The alarm is on the unit connections.	Investigate item 4.		
4	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 35	NC command error The movement command data received from the NC was excessive.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Is the rapid traverse rate large for using a sub-micron system or rotary axis?	The rapid traverse rate is large.	Check the rapid traverse rate limit.	○	○
		The rate is not especially large.	Look for problems on the NC side, such as not being able to follow up the position FB.		

Alarm No. 36	Communication or transmission error between NC and drive unit Communication from the NC was cut off.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the NC bus communication cable connectors (CN1A, CN1B) are disconnected.	The connector is disconnected (or loose).	Connect correctly.	○	○
		The state is not improved.	Investigate item 2.		
2	Check the NC bus communication cable connection. • Is the cable disconnected? • Is the communication pair cable connected in reverse?	The connection is incorrect.	Replace the cable.	○	○
		There is no problem.	Investigate item 3.		
3	Change the order of the connected drive units. (The rotary switch does not need to be changed.)	The alarm is on the cable connections.	Replace the cable.	○	○
		The alarm is on the unit connections.	Investigate item 4.		
4	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 37	Initial parameter error An illegal parameter was detected in the parameters received from the NC at NC power ON. "S02 initial parameter error ####" is displayed on the NC screen. #### indicates the incorrect parameter No.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the error parameter No.	SV001 to SV065 (M60S Series: 2201 to 2265) SP001 to SP384 (M60S Series: 3201 to 3584)	Set the value within the designated setting range.	○	○
		SV101 (M60S Series: 2301) The electronic gears are overflowing.	Check SV001, SV002 and SV018.		
		SV102 (M60S Series: 2302) The absolute position detection parameter is valid when OSE104 and OSE105 are connected.	Absolute position control cannot be used. To use, change to an absolute position detector.	○	
		SV104 (M60S Series: 2304) No SHG control operation is provided.	SHG control cannot be used.		
		SV105 (M60S Series: 2305) No adaptive filter option is provided.	The adaptive filter cannot be used.	○	

(Note) Refer to "6-3-4 Parameter numbers at initial parameter error".

Alarm No. 38	Communication or protocol error 1 between NC and drive unit An error was detected in the communication frame received from the NC.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "34" items.			○	○

Alarm No. 39	Communication or protocol error 2 between NC and drive unit An error was detected in the axis information data received from the NC.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "34" items.			○	○

Alarm No. 3A	Overcurrent An excessive current was detected in the motor drive current.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether vibration is occurring.	Vibration is occurring.	• Set a filter. • Lower the speed loop gain (SV005).	○	
		There is no vibration.	Investigate item 2.		
2	The speed loop gain (SV005) setting is larger than the standard value.	The setting is too large.	Set an appropriate value.	○	
		The setting is approximately the same as the standard value.	Investigate item 3.		
3	Check the current loop gain. (SV009, SV010, SV011, SV012)	The setting is incorrect.	Set the standard value.	○	
		The standard value is set.	Investigate item 4.		
4	Disconnect the UVW phase wiring from the terminal block, and the cannon plug from the motor. Check the insulation with a tester.	The power cable is short-circuited.	Replace the motor power cable.	○	
		There is no problem.	Investigate item 5.		
5	Check the insulation between the motor power cable and FG.	There is a ground fault at the power cable.	Replace the motor power cable.	○	
		There is no problem.	Investigate item 6.		
6	Connect the cannon plug, and check the insulation between the power cable and FG.	There is a ground fault in the motor.	Replace the motor. (With the absolute position system, the zero point must be established.)	○	
		There is no problem.	Investigate item 7.		
7	Check if there is any abnormality in the motor's ambient environment. (Ex. Ambient temperature, cutting water)	No abnormality is found in particular.	Replace the drive unit.	○	
		An abnormality was found in the ambient environment.	Improve the installation environment. (With the absolute position system, the zero point must be established.)		

Alarm No. 3B	Power module overheat The power module's temperature protection function activated.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Turn the unit power ON again, and confirm the rotation of the fan. Note) Assure more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. For the fan used for the drive unit, assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON is required.	The fan is rotating, and an alarm did not occur again.	Continue to use. The power may be turned ON without assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. Leave for more than 10 seconds or more, and turn the power ON again.	○	○
		The fan did not rotate. Or, an alarm occurred again.	Investigate item 2.		
2	Confirm adhesion of cutting oil or cutting chips, etc. at the fan. Or check if there is any abnormality such as low rotation speed.	Large amounts of cutting oil or cutting chips, etc., are adhered, or the rotation is slow.	Clean or replace the fan.	○	○
		The fan is rotating properly.	Investigate item 3.		
3	Check whether the heat dissipating fins are dirty.	Cutting oil or cutting chips, etc., are adhered, and the fins are clogged.	Clean the fins.	○	○
		The fins are normal.	Investigate item 4.		
4	Measure the drive unit's ambient temperature.	55°C or more	Improve the ventilation and cooling for the power distribution panel.	○	○
		Less than 55°C.	Investigate item 5.		
5	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	If the alarm occurs even after the unit temperature has dropped, replace the unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 3D	Spindle speed lock Even when the maximum torque was commanded, the motor speed does not increase to 45r/min or more.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Does the alarm occur immediately after the power is turned ON?	Occurs immediately after power is turned ON.	Investigate item 2.		○
		Occurs after normal operation.	Investigate item 5.		
2	Is there any abnormal noise when starting?	There is abnormal noise.	Investigate item 4. (The initial pole estimate may be incorrect.)		○
		There is no abnormal noise.	Investigate item 3.		
3	Check that the PN voltage is supplied to the drive unit. • Is the CHARGE lamp ON?	The voltage is not supplied.	Correctly supply the PN voltage.		○
		Approx. 300V is correctly supplied.	Investigate item 3.		
4	Check the motor power cable (U, V, W phases). (Also check the operation immediately after emergency stop is cancelled.) • The power cable is not connected. • Is the cable connected to the motor for another axis? • Is the contactor between the drive unit and motor OFF? (When using coil changeover specifications.)	The connections are incorrect.	Connect correctly.		○
		The connections are correct.	Investigate item 5.		
5	Check the load value with the spindle monitor, and investigate the machine's load state.	The cutting load is large.	Lower the cutting load.		○
		The cutting load is not large.	Investigate item 6.		
6	Check whether the spindle rotary section is locked with a mechanical lock (C-axis clamp, etc.).	Locked with a mechanical lock.	Remove the cause of the lock.		○
		Not locked with a mechanical lock.	Investigate item 7.		
7	Try replacing the drive unit.	Improved.	Replace the drive unit.		○
		Not improved.	Investigate the motor. (Check the motor type and parameters.)		

Alarm No. 3E	Spindle speed overrun 1. A state in which the motor's speed feedback exceeded the speed command and accelerated was detected. 2. Even though the speed command is 0 (including when stopped during position control), motor rotation exceeding the parameter setting value was detected.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Does the alarm occur immediately after the power is turned ON?	Occurs immediately after power is turned ON.	Investigate item 2.		○
		Occurs after normal operation.	Investigate item 3.		
2	Check the motor power cable (U, V, W phases). (Also check the operation immediately after emergency stop is cancelled.) • The power cable is not connected. • Is the cable connected to the motor for another axis? • Is the contactor between the drive unit and motor OFF? (When using coil changeover specifications.)	The connections are incorrect.	Connect correctly.		○
		The connections are correct.	Investigate item 3.		
3	Check whether the spindle rotary section is locked with a mechanical lock (C-axis clamp, etc.).	Locked with a mechanical lock.	Remove the cause of the lock.		○
		Not locked with a mechanical lock.	Investigate item 4.		
4	Try replacing the drive unit.	Improved.	Replace the drive unit.		○
		Not improved.	Investigate the motor. (Check the motor type and parameters.)		

Alarm No. 3F	Speed excessive deflection 2 During constant speed operation, the difference between the speed command and speed feedback exceeded the set amount and set time.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the load value with the spindle monitor, and investigate the machine's load state.	The cutting load is large.	Lower the cutting load.		○
		The cutting load is not large.	Investigate item 2.		
2	Check whether the spindle rotary section is locked with a mechanical lock (C-axis clamp, etc.).	Locked with a mechanical lock.	Remove the cause of the lock.		○
		Not locked with a mechanical lock.	Investigate item 3.		
3	Try replacing the drive unit.	Improved.	Replace the drive unit.		○
		Not improved.	Investigate the motor. (Check the motor type and parameters.)		

Alarm No. 40	Detector changeover unit, changeover error During 1-drive unit 2-motor control, an error was detected in the motor changeover signal received form the detector changeover unit.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Wiggle the FR-TK unit connector by hand to check whether it is disconnected.	The connector is disconnected (or loose).	Correctly install.		○
		The connector is not disconnected.	Investigate item 2.		
2	Check whether the cable connected between the spindle drive unit and FR-TK unit is broken.	The cable is broken.	Replace the cable.		○
		The cable is not broken.	Investigate item 3.		
3	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.		○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 41	Detector changeover unit, communication error During 1-drive unit 2-motor control, an error was detected in the communication with the detector changeover unit.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "40" items.				○

Alarm No. 42	Feedback error 1 With the servo, pulse-type position detector feedback signal error was detected. With the spindle, a PLG feedback signal error was detected.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the drive unit connectors (servo: CN3, spindle: CN6) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Investigate item 2.		
2	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.	○	○
		The connection is normal.	Investigate item 3.		
3	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	○
		The alarm is on the detector side.	Servo : Investigate item 5. Spindle : Investigate item 4.		
4	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal	Investigate item 5.		
5	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 43	Feedback error 2 With the servo, an excessive error was detected in the position data for the motor side detector and machine side detector. With the spindle, an error was detected in the encoder feedback signal.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the drive unit connectors or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Investigate item 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Connect together on the drive unit side.	○	
		The motor is grounded to one point.	Investigate item 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 5.		
5	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 6.		
6	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 44	C-axis changeover alarm When using the coil changeover control motor, the mode was changed to C-axis control while the high-speed coil was selected.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the coil selected with the spindle control input 3, bitD for the C-axis control command.	High-speed coil is selected (bitD = 0)	Correct the sequence.		○
		Low-speed coil is selected (bitD= 1)	Investigate item 2.		
2	Is coil changeover validated for the special motor specifications?	Coil changeover valid (SP034/bit2 = 1)	Correctly set the parameter.		○
		Coil changeover invalid (SP034/bit2 = 0)	Replace the drive unit.		

Alarm No. 46	Motor overheat The temperature protection function in the motor or detector activated.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the repeatability.	The alarm occurs before operation.	Investigate item 2.	○	○
		The alarm occurs occasionally after operation is started.	Investigate item 5.		
2	Check whether the drive unit connectors (servo: CN3, spindle: CN6) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Investigate item 3.		
3	Using a tester, check whether the detector cable is broken.	The cable is broken.	Replace the cable.	○	○
		The cable is not broken.	Servo : Investigate item 4. Spindle : Investigate item 12.		
4	When using MDS-B-HR, is the motor thermal validated even when it is not provided?	SV034/bit2 = 0	Set SP034/bit2 to 1.	○	
		SV034/bit2 = 1	Investigate item 12.		
5	Check the overload % (servo) or load meter (spindle).	The load is large.	Servo : Investigate item 6. Spindle : Investigate item 8.	○	○
		The load is not large.	Investigate item 9.		
6	Is the unbalance torque high?	The constant load torque (friction + unbalance) is 60% or more.	Select the motor so that the constant load torque is 60% or less.	○	
		The constant load torque is less than 60%.	Investigate item 7.		
7	Was the overload alarm (50) forcibly reset by turning the drive unit power OFF?	The alarm was forcibly reset.	Do not turn the drive unit's power OFF when an overload alarm occurs. (The NC power can be turned OFF.)	○	
		The alarm was not forcibly reset.	Investigate item 9.		
8	Check the parameter settings.	There was an incorrect setting.	Correctly set.		○
		The settings are correct.	Investigate item 9.		
9	Measure the motor temperature when the alarm occurs.	Hot.	Investigate item 10.	○	○
		Not hot.	Investigate item 12.		
10	When using a motor with fan, check whether the fan is stopped, or whether it is clogged with dust, etc.	The fan motor was stopped.	Investigate item 11.	○	○
		The motor fan wind flow is poor.	Clean.		
		There is no problem.	Investigate item 12.		
11	Check the fan wiring.	The cable is broken.	Replace the cable.	○	○
		The cable is not broken.	Replace the fan.		
12	Try replacing the drive unit.	Improved.	Replace the drive unit.	○	○
		Not improved.	Replace the motor.		

Alarm No. 4E	NC command mode error A spindle control mode selection outside the specifications was input.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Pinpoint where the alarm occurs in the PLC program.	The alarm always occurs at the same position.	Check the NC and PLC program process.		○
		The alarm occurs irregularly.	Investigate item 2.		
2	Does the alarm occur when position control (C-axis, spindle synchronization, synchronous tap) is started?	The alarm occurs during position control.	Check the NC and PLC program process.		
		The alarm occurs during speed control.	Check the NC and PLC program process. (If the cause cannot be pinpointed, replace the drive unit, and confirm.)		○

Alarm No. 50	Overload 1 The overload detection level reached 100% or more. The motor or drive unit is in the overload state.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the overload parameters. Servo : SV021, SV022 Spindle : SP063, SP064	The standard values (below) are not set. Servo : SV021 = 60, SV022 = 150 Spindle : SV063 = 60, SP064 = 110	Set the standard values.	○	○
		The standard values are set.	Investigate item 2.		
2	Check the overload % (servo) or load meter (spindle).	The load is large.	Servo : Investigate item 3. Spindle : Investigate item 7.	○	○
		The load is not large.	Investigate item 9.		
3	Check whether machine resonance is occurring.	Resonance is occurring.	Adjust the parameters. • Set the notch filter. • Lower VGN1 (SV005).	○	
		Resonance is not occurring.	Investigate item 4.		
4	Check whether the shaft sways when the motor is stopped. (Hunting)	The motor is hunting.	Adjust the parameters. • Increase VGN1 (SV005). • Lower VIA (SV008).	○	
		The motor is not hunting.	Investigate item 5.		
5	Check the brake operation Check the brake relay. Check the connector (CN20) connection.	The motor brakes are not released.	Correct the faulty section.	○	
		The motor brake operation is normal.	Investigate item 6.		
6	Check the load current with the NC Servo Monitor, and investigate the machine load.	The cutting load is large.	Lower the cutting load.	○	
		There is interference with the positioning pin.	When using the positioning pin, turn the servo OFF when stopped.		
		An excessive force is applied from the machine.	Check whether the ball screw is bent, or whether there is a fault in the guide.		
		The machine load is not large.	Investigate item 8.		
7	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal	Investigate item 8.		
8	Confirm the motor capacity selection again.	The motor performance is insufficient.	Lower the acceleration/deceleration rate or cutting load.	○	○
		The motor performance is sufficient.	Investigate item 9.		
9	Try replacing the drive unit.	Improved.	Replace the drive unit.	○	○
		Not improved.	Replace the motor.		

(Note) NR and PR resetting are not possible when the overload level is 50% or more. Do not forcibly reset (AR) by turning the unit power OFF. If AR resetting is used at 50% or higher, the level is set to 80% when the power is turned ON next. (Servo)

Alarm No. 51	Overload 2 With the servo, a current command exceeding 95% of the unit's maximum current continued for one second or more. With the spindle, a load exceeding the continuous rating continued for 30 minutes or more.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Did the alarm occur immediately after READY ON?	The alarm occurred after ready ON before operation starts.	Investigate item 2.	○	
		The alarm occurred after normal operation.	Investigate item 5.		
2	Check that the PN voltage is supplied to the drive unit. Is the CHARGE lamp ON?	The voltage is not supplied.	Correctly supply the PN voltage.	○	
		Approx. 300V is correctly supplied.	Investigate item 3.		
3	Check the motor power cable (U, V, W phases). The power cable is not connected. Is the cable connected to the motor for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Investigate item 4.		
4	Check the detector cable connection. Is the cable connected to the motor for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Investigate item 5.		
5	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Investigate item 6.		
6	Check whether the current value on the NC Servo Monitor screen is saturated during acceleration/deceleration.	The current is saturated during acceleration/deceleration.	Increase the acceleration/ deceleration time constant.	○	
		The current value during acceleration/deceleration is appropriate.	Investigate item 7.		
7	Check the detector FB.	The FB signal is abnormal.	Replace the detector. (With the absolute position system, the zero point must be established.)	○	
		The FB signal is normal.	Replace the drive unit.		
8	Check the load meter value.	The load is large.	Lower the load.		○
		The load is not large.	Investigate item 9.		
9	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal	Replace the drive unit.		

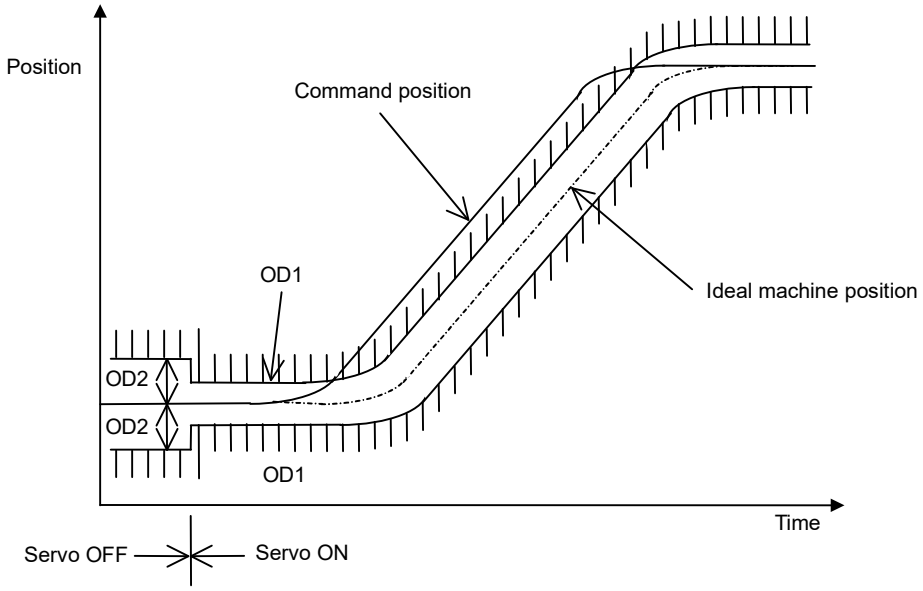
Alarm No. 52	Excessive error 1 The difference between the motor's actual position at servo ON and the theoretical position exceeded the setting value.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the excessive error detection width. SV023 (Servo) SP102 (Orientation control) SP154, SP155 (C-axis control) SP177/bitD, SP186 (Spindle synchronous control) SP193/bitD, SP218 (Synchronous tap)	The excessive error detection width is too small. Servo standard value: $SV023 = \frac{RAPID}{60 \times PGN1} \div 2$ For the spindle, a value larger than the droop amount: Droop amount = $\frac{\text{Spindle rotation speed} \times \text{No. of pulses}}{60 \times \text{position loop gain}}$	Set appropriate values.	○	○
		Appropriate values are set.	Investigate item 2.		
2	Check the position detector polarity. SV017/bit4 (Servo) SP097/bit5 (Orientation control) SP129/bit5 (C-axis control) SP177/bit5 (Spindle synchronous control) SP193/bit5 (Synchronous tap control)	The polarity is reversed.	Correctly set the parameters.	○	○
		Normal.	Investigate item 3.		
3	Check the alarm No. "51" items.			○	○

Alarm No. 53	Excessive error 2 The difference between the motor's actual position at servo OFF and the theoretical position exceeded the setting value.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the follow-up function while the NC is in the servo OFF state.	NC parameter (M60S Series) #1064 svof = 0	Investigate item 2.	○	
		NC parameter (M60S Series) #1064 svof = 1	Investigate item 3.		
2	Check whether the axis has moved during servo OFF, and check the motor brake operation.	The axis moved.	Adjust the brakes, etc., so that the axis does not move.	○	
		The axis has not moved.	Investigate item 3.		
3	Check the excessive error detection width. SV026 (Servo)	The excessive error detection width is too small. $SV026 = \frac{RAPID}{60 \times PGN1} \div 2$	Set an appropriate value.	○	
		An appropriate value is set.	Check for problems on the NC side, such as the position FB follow-up control.		

Alarm No. 54	Excessive error 3 The motor current was not detected when the excessive error 1 alarm occurred.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check that the PN voltage is supplied to the drive unit. • Is the CHARGE lamp ON?	The voltage is not supplied.	Correctly supply the PN voltage.	○	
		Approx. 300V is correctly supplied.	Investigate item 2.		
2	Check the motor power cable (U, V, W phases). • The power cable is not connected. • Is the cable connected to the motor for another axis?	The connections are incorrect.	Connect correctly.	○	
		The connections are correct.	Replace the drive unit.		

Supplement (servo)

Depending on the ideal machine position in respect to the command position, the actual machine position could enter the actual shaded section shown below, which is separated more than the distance set in OD1.



Alarm No. 58	Collision detection 1 G0 When the collision detection function is valid, the disturbance torque exceeded the collision detection value during rapid traverse (G0).				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.		
		The machine has not collided.	Increase the detection level (SV060). (The detection level should have an allowance and be set as approx. 1.5-times the maximum disturbance torque.)	○	

Alarm No. 59	Collision detection 1 G1 When the collision detection function is valid, the disturbance torque exceeded the collision detection level during cutting feed (G1).				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.		
		The machine has not collided.	Increase the detection level (SV035. clG1). (Set the detection level larger than the maximum cutting load.)	○	

Alarm No. 5A	Collision detection 2 When the collision detection function is valid, the command torque reached the motor's maximum torque.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the machine has collided.	The machine has collided.	Check the machining program and soft limit settings.	○	
		The machine has not collided.	Investigate item 2.		
2	Check whether the current value on the NC Servo Monitor screen is saturated during acceleration/deceleration.	The current is saturated during acceleration/deceleration.	Investigate item 3.		
		The current value during acceleration/deceleration is appropriate.	Investigate the cause of the load fluctuation.	○	
3	Can the acceleration/deceleration time constant be changed?	The constant can be changed.	Increase the acceleration/ deceleration time constant.	○	
		The constant cannot be changed.	Set to ignore collision detection method 2.		

Alarm No. 5C	Orientation feedback error After orientation was completed, the command and feedback error exceeded the parameter setting.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the PLG cable shield.	The cable is not correctly shielded.	Shield the cable.		○
		The cable is correctly shielded.	Investigate item 2.		
2	Check the PLG cable connection.	The cable is incorrectly connected or broken.	Replace the cable.		○
		Normal	Investigate item 3.		
3	Check the PLG output waveform.	There is a problem.	Adjust the PLG output waveform.		○
		Normal	Replace the drive unit		

Alarm No. 60	Instantaneous power failure A drop in the 24VDC power was detected.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Is 24VDC applied on the CN22 connector? Is the voltage low, or does it drop sometimes?	The voltage is not applied.	Investigate item 3.		○
		The voltage is 20.4VDC or less.	Increase the power voltage.		
		The voltage drops below 20.4VDC sometimes.	Investigate item 4.		
		The voltage is correctly applied.	Investigate item 2.		
2	Are the LEDs on the CR unit ON?	The LEDs are not ON.	Replace the unit.		○
		The LEDs are ON.	Investigate item 4.		
3	Check the wiring and power voltage.	The power is abnormal.	Replace the power.		○
		The wiring or connectors are abnormal.	Replace the cable.		
4	Check whether the voltage is dropping because of another load.	A voltage drop is not observed.	Check the wiring.		○
		A voltage drop is observed.	Increase the power capacity.		

Alarm No. 61	Power module overcurrent The power module's overcurrent protection function activated.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the state of the operation when the alarm occurs, and check the repeatability.	The alarm occurs immediately after 200VAC is supplied and after READY is turned ON.	Replace the unit.	○	
		The alarm occurs frequently during READY ON.	Investigate item 3.		
		The alarm occurs after continuous operation for a long time. The unit is hot.	Investigate item 2.		
2	Check the load state of all motors, and the starting/stopping frequency.	The total load of all motors exceeds the rated capacity of the power supply unit.	Lower the motor load and operation frequency.	○	
		The total does not exceed the capacity.	Investigate item 3.		
3	Check the power capacity.	The power capacity is insufficient.	Increase the power capacity.	○	
		The specified power capacity is secured.	Investigate item 4.		
4	Measure the voltage across wires. • Is the voltage 170V or more even when the motor is accelerating?	The voltage drops to 170V or less occasionally.	Increase the power capacity.	○	
		The difference of the voltage across wires is 10V or more.	Improve the power phase balance.		
		The difference of the voltage across wires is less than 10V.	Investigate item 5.		
5	Measure the power voltage with a synchroscope, and check whether there is any distortion. • Are there any other devices causing the power distortion?	The power voltage is distorted.	Improve the source of the distortion. Install an AC reactor.	○	
		The power voltage waveform is not abnormal.	Investigate item 6.		
6	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		

Alarm No. 62	Frequency error The input power frequency exceeded the specified range.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the state of the operation when the alarm occurs, and check the repeatability.	The alarm occurs each time immediately after the power is turned ON. Or, the alarm occurs occasionally regardless of the operation state.	Investigate item 2.	○	
		The alarm occurs only while the motor is accelerating/decelerating.	Investigate item 3.		
2	Measure the power voltage waveform during normal operation.	The frequency is deviated from 50Hz±3% or 60Hz±3%.	Review the power facilities.		
		The voltage waveform dips at some sections.	Improve the source of the distortion. Install an AC reactor.	○	
		There is no problem.	Investigate item 4.		
3	Measure the power voltage when the motor is accelerating/decelerating.	The frequency greatly fluctuates during acceleration/deceleration.	Review the power facilities.		
		The voltage waveform during deceleration dips in some sections.	Improve the source of the distortion. Install an AC reactor.	○	
		There is no problem.	Investigate item 4.		
4	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.		
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.	○	

Alarm No. 63	Auxiliary regeneration error The auxiliary regenerative transistor is still ON.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check whether the regenerative resistor on the back of the unit is dirty.	Cutting oil or oil mist is adhered on the regenerative resistor.	Take measure to prevent cutting oil and dust from getting on the fins at the back of the unit, and then carry out investigation details 2.		○
		The resistor is not dirty.	Replace the unit.		
2	Using a tester, check the continuity of the terminal block and resistor surface.	There is continuity.	Replace the unit.		
		The resistance value is ∞.	Clean the resistor or fins.		○

Alarm No. 65	Rush relay error The rush resistance short-circuit relay does not turn ON.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.		○
		The alarm occurs occasionally.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.		
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		○

Alarm No. 67	Phase failure There is a phase failure in the input power.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the voltage for each input phase.	There are phases with no voltage.	Correct the power supply.	○	
		There is no problem.	Investigate item 2.		
2	Check the alarm No. "71" items.			○	

Alarm No. 68	Watch dog The system is not operating normally.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.	○	○
		The alarm occurs occasionally.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	○
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		

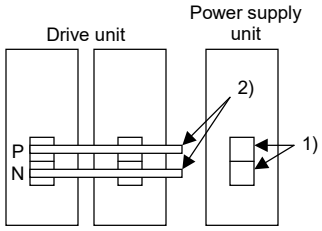
Alarm No. 69	Ground fault The motor power cable is contacting FG (ground).				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Measure the insulation across the U, V, W phase cables for all motors and the ground. (Carry out a megger test.)	100kΩ or less.	The motor or power cable may be ground faulted.	○	○
		100kΩ or more.	Investigate item 2.		
2	Has oil come in contact with the motor or power cable?	Oil has come in contact.	Take measures so that oil does not come in contact. Check the motor's cannon connector and the inside of the terminal box, and clean as necessary.	○	○
		Oil has not come in contact.	Investigate item 3.		
3	Measure the insulation again.	1MΩ or less.	Replace the motor or cable.	○	○
		1MΩ or more.	Investigate item 2.		
4	Measure the resistance across the U, V, W phase terminals of the servo/spindle drive unit and the ground. (Do not measure the insulation, as the unit could be damaged.)	100kΩ or less.	Replace the drive unit.	○	○
		100kΩ or more.	Replace the power supply unit.		

Alarm No. 6A	External contactor melting The external contactor's contact has melted.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check whether any alarm has occurred on the drive unit side.	An alarm has occurred.	Remove the cause of the alarm on the drive side, and then carry out the investigation details 2.	○	
		An alarm has not occurred.	Investigate item 2.		
2	Check whether the contactor's contact has melted.	The contactor has melted.	Replace the contactor.	○	
		The contactor has not melted.	Investigate item 3.		
3	Check that the contactor excitation wiring is correctly connected from the power supply unit's MC1 terminal.	The connection is correct.	Correctly connect.	○	
		The connection is incorrect.	Replace the power supply unit.		

Alarm No. 6B — Rush relay melted
The rush resistance short-circuit relay does not turn OFF.

	Investigation details	Investigation results	Remedies	CV	CR
1	Check whether any alarm has occurred on the drive unit side.	An alarm has occurred.	Remove the cause of the alarm on the drive side, and then carry out the investigation details 2.		○
		An alarm has not occurred.	Investigate item 2.		
2	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.		○
		The alarm occurs occasionally.	Investigate item 3.		
3	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.		○
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		

Alarm No. 6C — Main circuit error
An abnormality was detected in the main circuit capacitor's charging operation.

	Investigation details	Investigation results	Remedies	CV	CR
1	Check the CHARGE lamp state when the alarm occurs.	The CHARGE lamp remains ON for some time.	Replace the power supply unit.	○	○
		The lamp turns ON instantly, but when the alarm occurs and the contactor turns OFF, the lamp turns OFF immediately.	Investigate item 2.		
		The lamp never turns ON.	Investigate item 2. Then replace the unit.		
2	Disconnect the power supply unit's PN terminal block wiring, and measure the resistance value at 1) and 2) shown below. 	1) The power supply unit side is abnormal.	Replace the power supply unit.	○	○
		2) The drive unit side is abnormal.	Disconnect the PN wiring, and then check the drive unit side.		
		1) and 2) are both normal.	Replace the power supply unit.		

Tester measurement point	Polarity +	Polarity -	Normal	Abnormal
1)	P	N	Several 100Ω	Short-circuit/∞Ω
	N	P	∞Ω	Several 100Ω
2)	P	N	Several 100Ω	Short-circuit/∞Ω
	N	P	∞Ω	Several 100Ω

Alarm No. 6D — Parameter error
The power supply unit's capacity is not appropriate for the regenerative resistor type set with the parameters.

	Investigation details	Investigation results	Remedies	CV	CR
1	Check the parameters (regenerative resistor type) of the drive unit to which the power supply unit's control wire (CN4) is connected. Servo: SV036, Spindle: SP041	SV036 and SP041 setting			○

F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
amp				rtyp				ptyp							

rtyp	Regenerative resistor type	CR-10	CR-15	CR-22	CR-37	CR-55	CR-75	CR-90
0	For MDS-C1-CV	×	×	×	×	×	×	×
1	GZG200W260HMJ	○	○	○	○	○	○	○
2	GZG300W130HMJ×2	○	○	○	○	○	○	○
3	MR-RB30	×	×	×	○	○	○	○
4	MR-RB50	×	×	×	○	○	○	○
5	GZG200W200HMJ×3	×	×	×	×	×	○	○
6	GZG300W200HMJ×3	×	×	×	×	×	○	○
7	R-UNIT-1	○	○	○	○	○	○	○
8	R-UNIT-2	×	×	×	○	○	○	○
9	R-UNIT-3	×	×	×	○	○	○	○
A~F	No setting	×	×	×	×	×	×	×
ptyp setting		81	82	83	84	86	88	89

Alarm No. 6E	Memory error An error was detected in the internal memory.

	Investigation details	Investigation results	Remedies	CV	CR
1	Check the repeatability.	The alarm occurs each time READY is turned ON.	Replace the unit.	○	○
		The alarm occurs occasionally.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	○
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		

Alarm No. 6F	Power supply error The power supply is not connected. An error was detected in the power supply's A/D converter. This is detected simultaneously if another power supply alarm occurs.

	Investigation details	Investigation results	Remedies	CV	CR
1	Check the LED display on the power supply unit.	"F" is flickering.	An A/D converter error has occurred. Carry out the items for alarm No. 6E.	○	○
		Another alarm code is flickering.	Refer to the section for each alarm.		
		"0" is displayed.	Investigate item 2.		
		"F" is displayed.	Investigate item 2.		
		"8" is displayed.	Refer to the section for alarm No.68.		
		"b", "C", "d" is displayed.	Investigate item 3.		
		Something else is displayed.	Refer to the section for alarm No.68.		
2	Check the rotary switch setting.	0 or 4 is set.	Investigate item 3.	○	○
		A value other than the above is set.	Correctly set the rotary switch.		
3	Check the communication cable (CN4) connected with the drive unit.	There is a problem with the wiring or shield.	Replace the cable.	○	○
		There is no problem.	Replace the unit.		

(Note) Alarm 6F is detected at the same time other power supply alarms occur.

Alarm No. 71	Instantaneous power failure/ external emergency stop An instantaneous power failure occurred.

	Investigation details	Investigation results	Remedies	CV	CR
1	Investigate the sequence to check whether the contactor has been turned OFF with an emergency stop button, etc.	The contactor has been turned OFF externally.	Review the machine sequence. When turning the contactor OFF with external means, such as an emergency stop button, this alarm can be avoided by inputting NC emergency stop at the same time.	○	
		The contactor has not been turned OFF.	Investigate item 2.		
2	Check the repeatability.	The alarm occurs each time READY is turned ON.	Investigate item 3.	○	
		The alarm occurs at a certain operation.	Investigate item 1. If there is no problem, carry out investigation item 3.		
		The alarm occurs occasionally during operation.	Investigate item 4.		
3	Check whether the power input wire and contactor are correctly wired.	The wiring is incorrect.	Correctly connect.	○	
		There is no problem.	Investigate item 4.		
4	Check the power voltage waveform with a synchroscope.	An instantaneous power failure or voltage drop occurs frequently.	Correct the power facility.	○	
		There is no problem.	Replace the unit.		

Alarm No. 73	Over-regeneration The over-regeneration detection level exceeded 100%. The regenerative resistor is in the overload state.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the alarm occurrence state and regenerative load displayed on the NC Monitor screen while changing the operation mode.	The regenerative load display increases when the power is turned ON and the motor is not rotated.	Check whether the state is affected by power fluctuation, grounding or noise. If there is no problem, replace the unit.	○	○
		The regenerative load display increases each time the motor decelerates, and the alarm occurs.	A-CR : Investigate item 2. C1-CV : Investigate item 4.		
		The regenerative load display increases each time the motor decelerates, but the alarm does not occur when the operation mode is eased.	A-CR : Investigate item 2. C1-CV : Ease the operation mode.		
2	Check whether the parameter (regenerative resistor type) of the drive unit controlling the power supply unit is correct.	The setting is incorrect.	Correctly set. (Refer to the section for alarm No. 6D.)		○
		The setting is correct.	Investigate item 3.		
3	Check the regenerative resistor's state. • Is oil adhered? • Measure the resistance value.	The regenerative resistor is abnormal.	Replace the regenerative resistor.		○
		There is no problem.	Investigate item 4.		
4	Check the alarm No. "75" items.			○	○

Alarm No. 74	Regenerative resistor overheat The temperature protection function in the regenerative resistor activated.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check whether the regenerative resistor is overheated.	The resistor is overheated.	Investigate item 2.		○
		The resistor is not overheated.	Investigate item 3.		
2	Check the alarm history.	Check whether over-regeneration occurred before.	Refer to the section for alarm No.73.		○
		Over-regeneration has not occurred before.	Take measures to dissipate the regenerative resistor's heat. • Improve the ventilation. • Install a fan.		
3	Check the connections of the CN22 (B) connector pins 1 and 2. • Check whether the pins are short-circuited with the resistor's thermal terminal or wire.	The wire is about to break.	Replace the wire.		○
		There is no continuity at the resistor's thermal terminal.	Replace the resistor unit.		
		There is no problem.	Replace the power supply unit.		

Alarm No. 75	Overvoltage The main circuit PN bus voltage exceeded the tolerable value.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the repeatability.	The alarm occurs each time the motor decelerates.	Investigate item 3.	○	○
		The alarm occurs occasionally.	Investigate item 2.		
2	Check the power supply's alarm history.	Auxiliary regeneration frequency over (E8) occurs just before the overvoltage occurs.	Limit the occurrence of the excessive instantaneous regeneration by not decelerating multiple axes at the same time.	○	○
		Others.	Investigate item 3.		
3	Check the power capacity.	The power capacity is insufficient.	Increase the power capacity.	○	○
		The specified power capacity is secured.	Investigate item 4.		
4	Measure the voltage across wires. • Is the voltage 170V or more even when the motor is accelerating?	The voltage drops to 170V or less occasionally.	Increase the power capacity.	○	○
		The difference of the voltage across wires is 10V or more.	Improve the power phase balance.		
		The difference of the voltage across wires is less than 10V.	Investigate item 5.		
5	Measure the power voltage with a synchroscope, and check whether there is any distortion. • Are there any other devices causing the power distortion?	The power voltage is distorted.	Improve the source of the distortion. Install an AC reactor.	○	○
		The power voltage waveform is not abnormal.	Investigate item 6.		
6	Check if there is any abnormality in the unit's ambient environment. (Ex. Noise, grounding)	No abnormality is found in particular.	Replace the unit.	○	○
		The grounding is incomplete. An alarm will occur easily if another device operates.	Take remedies according to the causes of the abnormality. Ex. Incomplete grounding: Additionally ground. Noise: Noise measures for other devices.		

Alarm No. 76	External emergency stop setting error The rotary switch setting for the external emergency stop does not match the parameter setting.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the rotary switch settings and parameter settings.	When using external emergency stop: • Add 0040h to the normal setting for SV036 or SP041, and set the power supply's rotary switch to "4".		○	

Alarm No. 77	Power module overheat The power module's temperature protection function activated.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Turn the unit power ON again, and confirm the rotation of the fan. Note) Assure more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. For the fan used for the drive unit, assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON is required.	The fan is rotating, and an alarm did not occur again.	Continue to use. The power may be turned ON without assuring more than 10 seconds for the time from when the power is turned OFF till when it is turned ON. Leave for more than 10 seconds or more, and turn the power ON again.	○	
		The fan did not rotate. Or, an alarm occurred again.	Investigate item 2.		
2	Confirm that the fan is rotating correctly.	Large amounts of cutting oil or cutting chips, etc., are adhered, or the rotation is slow.	Clean or replace the fan.	○	
		The fan is rotating properly.	Investigate item 3.		
3	Check whether the heat dissipating fins are dirty.	Cutting oil or cutting chips, etc., are adhered, and the fins are clogged.	Clean the fins.	○	
		The fins are normal.	Investigate item 4.		
4	Measure the power supply unit's ambient temperature.	55°C or more	Improve the ventilation and cooling for the power distribution panel.	○	
		Less than 55°C.	Investigate item 5.		
5	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	If the alarm occurs even after the unit temperature has dropped, replace the unit.		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	

Alarm No. 7F	Power reboot request A mismatch in the program mode selection was detected. Turn the drive unit power ON again.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Were the parameter settings changed? SV009, SV010, SV011, SV012 SV033/bit8, 9	This alarm is detected if the high-gain specification parameters are set when the drive unit is started up with the standard specification software mode, or if the standard specification parameters are set when started up with the high-gain specifications.	Turn the drive unit's control power ON again.	○	

Alarm No. 88	Watch dog The system is not operating normally.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the servo software version was changed recently.	The version was changed.	Replace with a drive unit containing the original software version.	○	○
		The version was not changed.	Investigate item 2.		
2	Check the repeatability.	The alarm is always repeated.	Replace the drive unit.		
		The state is returned to normal once, but then the alarm occurs occasionally.	Investigate item 3.	○	○
3	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	○

Alarm No. 89	Encoder converter unit 2, connection error With the servo, an error was detected in the connection with the analog output linear scale for the MDS-B-HR unit. With the spindle, initial communication with the MDS-B-PJEX was not possible.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Wiggle the MDS-B-HR/MDS-B-PJEX unit connector (CON3) by hand to check whether it is disconnected.	The connector is disconnected (or loose).	Correctly install.	○	○
		The connector is not disconnected.	Servo : Investigate item 2. Spindle : Investigate item 4.		
2	Check whether the cable between the linear scale and MDS-B-HR is broken.	The cable is broken.	Replace the cable.	○	
		The cable is not broken.	Investigate item 3.		
3	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the MDS-B-HR unit.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		
4	Check whether the cable between the spindle drive unit and MDS-B-PJEX is broken.	The cable is broken.	Replace the cable.		○
		The cable is not broken.	Investigate item 5.		
5	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the drive unit.		○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 8A	Detection converter unit 2, communication error With the servo, an error was detected in the communication with the serial output linear scale for the MDS-B-HR unit. With the spindle, an error was detected in the communication with the MDS-B-PJEX.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "89" items.			○	○

Alarm No. 8B	Encoder converter unit 2, automatic adjustment error An abnormal signal from the PLG was detected during automatic adjustment of the PLG.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the MDS-B-PJEX connectors (CN5) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.		○
		The connector is not disconnected.	Investigate item 2.		
2	Turn the power OFF, and check the detector cable connection with a tester.	There is a connection fault.	Replace the detector cable.		○
		The connection is normal.	Investigate item 3.		
3	Check the PLG output waveform (A/B phase).	There is a problem. (The A/B phase input voltage is 0.8V or less or 2.2V or higher.)	Adjust the PLG output waveform.		○
		Normal	Investigate item 4.		
4	Check the occurrence frequency.	Occurs each time.	Replace the MDS-B-PJEX unit.		○
		Occurs occasionally.	Check whether the cable is disconnected, whether there is a contact fault, or a detector fault.		

Alarm No. 8C	Encoder converter unit 2, judgment error A detector type outside the specifications was detected with the MDS-B-PJEX.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check the spindle parameter SP042. SP042: C-axis control detector range. (Spindle end PLG No. of pulse setting)	The setting was incorrect. "4" : 128 pulses "5" : 256 pulses "6" : 512 pulses "8" : 180 pulses	Set correctly according to the No. of PLG gear teeth.		○
		The setting is correct.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the MDS-B-PJEX.		○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 8D	Detection converter unit 2, CPU error With the servo, a CPU error was detected with the MDS-B-HR unit. With the spindle, a CPU error was detected with the MDS-B-PJEX unit.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detection converter unit.	○	○
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		

Alarm No. 8E	Detection converter unit 2, data error A data error was detected with the MDS-B-HR unit.

	Investigation details	Investigation results	Remedies	SV	SP
1	Check whether the cable between the linear scale and MDS-B-HR is broken.	The cable is broken.	Replace the cable.	○	
		The cable is not broken.	Investigate item 2.		
2	Check if there is any abnormality in the unit's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Investigate item 3.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		
3	Try replacing the MDS-B-HR unit.	The state is improved.	Replace the MDS-B-HR unit.	○	
		The state is not improved.	Replace the linear scale.		

6-3-3 Troubleshooting for each warning No.

Warning No. 90	Detector, initial communication error Initial communication with the absolute position linear scale was not possible.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the servo parameter (SV025.pen) setting.	The setting is incorrect.	Correctly set SV025.	○	
		The setting is correct.	Investigate item 2.		
2	Check whether the drive unit connector (CN3) and detector connector are disconnected.	The connector is disconnected (loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 3.		
3	Turn the power OFF, and check the detector cable connection with a tester.	The connection is faulty.	Replace the detector cable (CN3 side).	○	
		The connection is normal.	Investigate item 4.		
4	Check if there is any abnormality in the tool end detector's ambient environment. (Ex.: Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the tool end detector. (With the absolute position system, the zero point must be established.)		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	

Warning No. 91	Detector, communication error An error was detected in the communication with the detector for the absolute position detection system.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether the drive unit connectors (CN3) or detector connectors are disconnected.	The connector is disconnected (or loose).	Correctly install.	○	
		The connector is not disconnected.	Investigate item 2.		
2	Is the detector cable wired in the same conduit as the motor's power cable or are the two cables laid in parallel near each other?	The cables are wired near each other. (Noise is entering from the power cable.)	Improve the cable wiring.	○	
		The wires are sufficiently separated.	Investigate item 3.		
3	Is the motor FG wire connected only to the drive unit which drives it? (Is the motor grounded to one point?)	The motor FG wire is grounded on the motor side.	Ground the motor to one point, connecting the wires together on the drive unit side.	○	
		The motor is grounded to one point.	Investigate item 4.		
4	Turn the power OFF, and check the detector cable connection with a tester. (Is the cable shielded?)	There is a connection fault.	Replace the detector cable.	○	
		The connection is normal.	Investigate item 5.		
5	Connect to another normal axis drive unit, and check whether the fault is on the drive unit side or detector side.	The alarm is on the drive unit side.	Replace the drive unit.	○	
		The alarm is on the detector side.	Investigate item 6.		
6	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Replace the detector. (With the absolute position system, the zero point must be established.)		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	

Warning No. 92	Detector, protocol error An error was detected in the data for the absolute position detection system.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Investigate item 2.		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	
2	Check the repeatability.	Occurs frequently.	Replace the detector.	○	○
		Is not repeated.	Investigate item 1.		

Warning No. 93	Initial absolute position fluctuation The position data fluctuated when creating the initial absolute position.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the state of the axis when the NC power is turned ON.	The vertical axis or slant axis drops when the NC power is turned ON.	Check the brake operation.	○	
		The axis moves with an external force when the NC power is turned ON.	Make sure that the axis does not move when the power is turned ON.		

Warning No. 96	MP scale feedback error An excessive deviation was detected between the motor end detector and MP scale feedback data for the MP scale absolute position detection system.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "43" items.			○	

Warning No. 97	MP scale offset error An error was detected in the offset data received from the MP scale for the MP scale absolute position detection system.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Investigate item 2.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		
2	Check the repeatability.	Occurs frequently.	Replace the detector.	○	○
		Is not repeated.	Investigate item 1.		

Warning No. 9E	Absolute position detector, multi-rotation counter error An error was detected in the multi-rotation counter for the absolute position detector. The absolute position cannot be compensated.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Investigate item 2.	○	
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.		
2	Check the repeatability.	Occurs frequently.	Replace the detector.	○	○
		Is not repeated.	Investigate item 1.		

(Note) When this alarm occurs, the absolute position system's zero point must be established.

Warning No. 9F	Battery voltage drop The voltage of the battery supplying to the absolute position detector has dropped. The absolute position data is held.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Measure the battery (MDS-A-BT) voltage.	Less than 3V.	Replace the battery unit.	○	
		3V or more.	Investigate item 2.		
2	Check whether the NC bus cable is disconnected.	The cable is disconnected.	Connect correctly.	○	
		There is no problem.	Investigate item 3.		
3	Check whether the battery wire in the detector cable is broken.	The cable is broken.	Replace the cable.	○	
		The cable is not broken.	Investigate item 4.		
4	Try replacing the drive unit.	Improved.	Replace the drive unit.	○	
		Not improved.	Replace the detector. (With the absolute position system, the zero point must be established.)		

(Note) When warning 9F occurs, do not turn the drive unit power OFF to ensure that the absolute position data is held. Replace the battery with the drive unit power ON.

Warning No. A8	Turret indexing error warning The commanded turret indexing position shift amount is outside the specified range.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the parameters. SP097/bitB = 0 command angle 1° unit SP097/bitB = 1 command angle 0.1° unit	The setting is incorrect.	Correctly set SP097.		
		The setting is correct.	Investigate item 2.		○
2	Pinpoint where the alarm occurs in the PLC program.	The position can be pinpointed.	Check the PLC program process.		
		The position cannot be pinpointed.	Investigate the details of the NC and PLC program process.		○

Warning No. A9	Orientation feedback error warning Retrying during an orientation feedback error.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "5C" items.				○

Warning No. E1	Overload warning The overload detection level is 80% or more.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the alarm No. "50" items.			○	○

Warning No. E3	Absolute position counter warning A deviation was detected in the absolute position data and relative position data.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check if there is any abnormality in the detector's ambient environment. (Ex. Ambient temperature, noise, grounding)	No abnormality is found in particular.	Investigate item 2.		
		An abnormality was found in the ambient environment.	Take remedies according to the causes of the abnormality. Ex. High temperature: Check the cooling fan. Incomplete grounding: Additionally ground.	○	
2	Check the repeatability.	Occurs frequently.	Replace the detector.	○	
		Is not repeated.	Investigate item 1.		

(Note) When this alarm occurs, the absolute position system's zero point must be established.

Warning No. E4	Parameter error warning A parameter exceeding the setting range was set. "S51 parameter error ####" is displayed on the NC screen. #### indicates the incorrect parameter No.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check the error parameter No.	SV001 to SV065 (M60S system: 2201 to 2265) SP001 to SP384 (M60S system: 3201 to 3584)	Set the value within the designated setting range.	○	○

Warning No. E6	Control axis removal warning Control axis removal was commanded.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	The status in which removal of the control axis was commanded from the NC is indicated.			○	

Warning No. E7	NC emergency stop Emergency stop was input from the NC.				
	Investigation details	**Investigation results**	**Remedies**	**SV**	**SP**
1	Check whether NC emergency stop was input.	Emergency stop was input.	The NC is in the emergency stop state. (Normal)	○	○
		Emergency stop was not input.	Investigate item 2.		
2	Check whether an alarm is occurring in another drive unit.	An alarm is occurring in another drive unit.	Reset the alarm in the other drive unit.	○	○
		An alarm is not occurring.	Investigate item 3.		
3	Check the NC communication bus line.	The terminator or battery unit's cable is disconnected.	Correctly connect.	○	○
		The NC communication bus connector (CN1A, CN1B) is loose, or the cable is broken.	Correctly connect the cable.		

Warning No. E8	Auxiliary regeneration frequency over Regeneration at the power supply performance limit is occurring frequently.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the alarm No. "75" items.				○

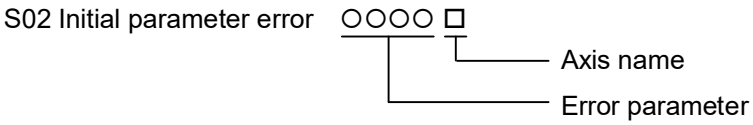
Warning No. E9	Instantaneous power failure warning An instantaneous power failure occurred.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the alarm No. "71" items.			○	

Warning No. EA	External emergency stop The external emergency stop signal was input.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check whether the specifications allow use of the external emergency stop.	Use not allowed.	Invalidate the external emergency stop.	○	
		Use is allowed.	Investigate item 2.		
2	Measure the input voltage of the CN23 connector. (While emergency stop is cancelled.)	24V is input.	Replace the power supply unit.	○	
		24V is not input.	Check whether the external emergency stop cable is broken, or check the external contact operation.		

Warning No. EB	Over-regeneration warning The over-regeneration level is 80% or more.				
	Investigation details	**Investigation results**	**Remedies**	**CV**	**CR**
1	Check the alarm No. "73" items.			○	

6-3-4 Parameter numbers during initial parameter error

If an initial parameter error (alarm 37) occurs, the alarm and the number of the parameter that may have been set exceeding the setting range will appear on the CNC Diagnosis screen. (For M60S, E60 Series NC.)



If an error number larger than the servo parameter number is displayed for the servo drive unit (MDS-C1-V1/V2), the alarm is occurring for several related parameters. Refer to the following table, and correctly set the parameters.

Error parameter No.	Details	Related parameters
2269	The CNC setting maximum rapid traverse rate value is incorrect. The CNC system software may be illegal. Turn the power ON again.	NC setting rapid
2271	The CNC setting maximum cutting speed setting value is incorrect. The CNC system software may be illegal. Turn the power ON again.	NC setting clamp
2301	The following settings are overflowing. Electronic gears Position loop gain Speed feedback	SV001, SV002 SV003, SV018 SV019, SV020 SV049
2302	The absolute position parameter is valid when OSE104 and OSE105 are connected.	SV017, SV025
2303	The servo option is not available. The closed loop or dual feedback control function is set.	SV025, SV017
2304	The servo option is not available. The SHG control function is set.	SV057, SV058
2305	The servo option is not available. The adaptive filter function is set.	SV027
2306	The servo option is not available. The MP scale absolute position function is set.	SV017
2308	The valid/invalid setting of the 4th or 5th notch filter is changed from the initial setting.	SV087, SV088

6-3-5 Troubleshooting the spindle system when there is no alarm or warning

If an abnormality is observed in the spindle system but no alarm or warning has occurred, refer to the following table and check the state.

[1] No abnormality is displayed, but the motor does not rotate.

	Investigation item	Investigation results	Remedies
1	Check the wiring around the spindle drive unit. Also check for loosening in the terminal screws and disconnec- tions, etc.	The wiring is incorrect, the screws are loose, or the cables are disconnected.	Correctly wire. Correctly tighten the screws. Replace the cables.
		No particular problems found.	Investigate investigation item 2 and remedy.
2	Check the input voltage.	The voltage is exceeding the specification value.	Restore the power to the correct state.
		The voltage is within the specification value.	Investigate investigation item 3 and remedy.
3	Check all of the spindle parameters.	The correct values are not set.	Set the correct values.
		The correct values are set.	Investigate investigation item 4 and remedy.
4	Check the input signals. • Are the READY, forward run and reverse run signals input? • In particular, the forward run and reverse run signals must be input at least one second after READY is turned ON. • Check whether the forward run and reverse run signals are turned ON simultaneously.	The signals are not input or the sequence is incorrect. The orientation command is input.	Correct the input signals.
		No particular problems found.	Investigate investigation item 5 and remedy.
5	Check the speed command.	The speed command is not input correctly.	Input the correct speed command.
		The speed command is input correctly.	Replace the unit.

[2] No fault is displayed, but the motor only rotates slowly, or a large noise is heard from the motor.

	Investigation item	Investigation results	Remedies
1	Check the U, V and W wiring between the spindle drive unit and motor.	The wires are not connected correctly.	Correctly connect.
		The wires are connected correctly.	Investigate investigation item 2 and remedy.
2	Check the input voltage.	One of the three phases is not within the specification value. No particular problems found.	Restore the power to the correct state. Investigate investigation item 3 and remedy.
3	Check the speed command.	The speed command is not input correctly.	Check the NC and PLC sequence.
		The speed command is input correctly.	Investigate investigation item 4 and remedy.
4	Tug on the connector by hand to check whether the speed detector connector (drive unit side and speed detector side) is loose.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Investigate investigation item 5 and remedy.
5	Turn the power OFF, and check the connection of the speed detector cable with a tester.	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The connection is normal.	Replace the drive unit.

[3] The rotation speed command and actual rotation speed do not match.

	Investigation item	Investigation results	Remedies
1	Check the speed command.	The speed command is not input correctly.	Input the correct speed command.
		The speed command is correct.	Investigate investigation item 2 and remedy.
2	Check whether there is slipping between the motor and spindle. (When connected with a belt or clutch.)	There is slipping.	Repair the machine side.
		No particular problems found.	Investigate investigation item 3 and remedy.
3	Check the spindle parameters (SP017, SP034, SP040, SP257 and following).	The correct values are not set.	Set the correct values.
		The correct values are set.	Replace the drive unit.

[4] The starting time is long or has increased in length.

	Investigation item	Investigation results	Remedies
1	Check whether the friction torque has increased.	The friction torque has increased.	Repair the machine side.
		No particular problems found.	Investigate investigation item 2 and remedy.
2	Manually rotate the motor bearings and check the movement.	The bearings do not rotate smoothly.	Replace the spindle motor.
		The bearings rotate smoothly.	Investigate investigation item 3 and remedy.
3	Check whether the torque limit signal has been input.	The signal has been input.	Do not input this signal.
		The signal is not input.	Replace the drive unit.

[5] The motor stops during cutting.

	Investigation item	Investigation results	Remedies
1	Check the load rate during cutting.	The load meter sways past 120% during cutting.	Reduce the load.
		No particular problems found.	Investigate the same matters as item (4), and remedy.

[6] The vibration and noise (gear noise), etc., are large.

	Investigation item	Investigation results	Remedies
1	Check the machine's dynamic balance. (Coast from the maximum speed.)	The same noise is heard during coasting.	Repair the machine side.
		No particular problems found.	Investigate investigation item 2 and remedy.
2	Check whether there is a resonance point in the machine. (Coast from the maximum speed.)	Vibration and noise increase at a set rotation speed during coasting.	Repair the machine side.
		No particular problems found.	Investigate investigation item 3 and remedy.
3	Check the machine's backlash.	The backlash is great.	Repair the machine side.
		No particular problems found.	Investigate investigation item 4 and remedy.
4	Check the spindle parameter settings. (SP022, SP023, SP056)	Symptoms decrease when setting value is set to approx. half.	Change the setting value. Note that the impact response will drop.
		The symptoms do not change even when the above value is set.	Return the setting values to the original values. Investigate investigation item 5 and remedy.
5	Tug on the connector by hand to check whether the speed detector connector (spindle drive unit side and speed detector side) is loose.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Investigate investigation item 6 and remedy.
6	Turn the power OFF, and check the connection of the speed detector cable with a tester.	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The connection is normal.	Replace the drive unit.

[7] The spindle coasts during deceleration.

	Investigation item	Investigation results	Remedies
1	Check whether there is slipping between the motor and spindle. (When connected with a belt or clutch.)	There is slipping.	Repair the machine side.
		No particular problems found.	Replace the drive unit.

[8] The rotation does not stabilize.

	Investigation item	Investigation results	Remedies
1	Check the spindle parameter settings. (SP022, SP023)	The rotation stabilizes when the settings values are both set to approx. double.	Change the setting value. Note that the gear noise may increase.
		The symptoms do not change even when the above value is set.	Return the setting values to the original values. Investigate investigation item 2 and remedy.
2	Tug on the connector by hand to check whether the speed detector connector (spindle drive unit side and speed detector side) is loose.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Investigate investigation item 3 and remedy.
3	Turn the power OFF, and check the connection of the speed detector cable with a tester. (Especially check the shield wiring.)	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The connection is normal.	Investigate investigation item 4 and remedy.
4	Investigate the wiring and installation environment. • Is the ground correctly connected? • Are there any noise-generating devices near the drive unit?	The grounding is incomplete.	Correctly ground.
		The alarm occurs easily when a specific device operates.	Use noise measures on the device described on the left.
		No particular problems found.	Replace the drive unit.

[9] The speed does not rise above a set level.

	Investigation item	Investigation results	Remedies
1	Check the speed command. Check whether the override input is input from the machine operation panel.	The speed command is not input correctly.	Input the correct speed command.
		The speed command is input correctly.	Investigate investigation item 2 and remedy.
2	Check whether the load has suddenly become heavier.	The load has become heavier.	Repair the machine side.
		No particular problems found.	Investigate investigation item 3 and remedy.
3	Manually rotate the motor bearings and check the movement.	The bearings do not rotate smoothly.	Replace the spindle motor.
		The bearings rotate smoothly.	Investigate investigation item 4 and remedy.
4	Tug on the connector by hand to check whether the speed detector connector (spindle drive unit side and speed detector side) is loose.	The connector is disconnected (or loose).	Correctly connect the connector.
		The connector is not disconnected (or loose).	Investigate investigation item 5 and remedy.
5	Turn the power OFF, and check the connection of the speed detector cable with a tester. (Especially check the shield wiring.)	The connection is faulty or disconnected.	Replace the detector cable. Correct the connection.
		The waveform is normal.	Replace the spindle drive unit.