

SECTION 4 TROUBLESHOOTING

Troubleshooting is described in the subsections 1 and 2, and procedures for recovery from errors are shown in the subsection 3.

⚠ WARNING Do not touch the high-voltage portions. They are dangerous.

Before inspecting or repairing the power unit, record the codes indicated on the seven-segment LED display.

Then, turn off the power and make sure that the DC CHARGE LED is turned off before inspecting or repairing the power unit.

1. Check points

Before taking actions described in the subsection 2, check the points in the following table.

Table 4-1. Check points

Checkpoint	Check method	Action
Power-supply voltage	Verify that the input power-supply voltage is within the permissible range at input terminals R, S and T of the drive unit. Permissible range: 180 to 220V AC (50/60 Hz)	Adjust the input power-supply voltage to the permissible range.
Connector connection	Check that the connectors *1 connected to the drive unit are connected to the correct locations.	Properly connect the cables.
	Check that the connectors *2 connected to the drive unit are securely screwed.	Tighten the screws to securely connect the connectors.

*1, *2 The connectors connected to the unit are as follows for systems VAC1 to VAC3.

	Connector *1	Connector *2
When using VAC1 system	XB-EX(CN1) XB-RES(CN3)	XB-EX(CN1) XB-RES(CN3)
When using VAC2 system	XB-EX(CN1) XB-OPT(CNOFS) XB-EPG(CN13) XB-RES(CN3)	XB-EX(CN1) XB-EPG(CN13) XB-RES(CN3)
When using VAC3 system	VAC5-D6: XB-OPT(CNOFS) XB-EPG(CN1) XB-CHG(CN12) XB-RES(CN11) VAC5-D11, VAC5-D22: XB-OPT(CNOFS) XB-EPG(CN2) XB-CHG(CN1) XB-RES(CN3)	VAC5-D6: XB-EPG(CN1) XB-CHG(CN12) XB-RES(CN11) VAC5-D11, VAC5-D22: XB-EPG(CN2) XB-CHG(CN1) XB-RES(CN3)

2. Errors and their classifications

In case of a failure, take proper actions against it referencing to the subsection indicated in the table below.

For procedures for inspecting and replacing the components, see “5. MAINTENANCE AND INSPECTIONS.”

Table 4-2. Error classifications

Subsection to refer to	Error
2-1	Display on the seven-segment LED display
2-2	Seven-segment LED display does not light. Display on the seven-segment LED display
2-3	Seven-segment LED display is indicating an error.
2-4	The motor does not run at the specified speed, or the motor does not rotate.
2-5	The cutting force has dropped.
2-6	The acceleration or deceleration time has increased.
2-7	Vibration or noise is strong when the motor is running.
2-8	The motor decelerates suddenly and stops although no alarm has occurred.

2-1. Seven-segment LED display does not light.

Table 4-3

Cause	Check method	Action
The input power is not being supplied.	Check whether input power terminal breaker is OFF.	Turn ON the breaker.
	Check whether the input power terminal breaker has tripped.	An earth fault has occurred inside the unit. Replace the unit.
	Check whether the input power terminal bolts or screws are loose.	Turn OFF the power and fully tighten the bolts and screws.
The power voltage is unusually low or high.	See "Table 4-1. Check points."	See Table 4-1.
Power is not being supplied to the control PCB inside the power unit.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
The control PC board is faulty.		

 **WARNING** Do not touch the high-voltage portions. They are dangerous.

If checking the input power terminal bolt and screw tightness, first turn OFF the power and ensure that the DC CHARGE LED has gone out.

 **WARNING** Do not touch the high-voltage portions. They are dangerous.

Pay sufficient attention to checking the power voltage.

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2-2. Seven-segment LED display is indicating an error.

If the seven-segment LED display is indicating an error, refer to “4. Display in error status mode” in Section 3 to check what alarm is pending, and take proper actions according to the Table 4-4.

Table 4-4 (1/14)

AlarmNo.	Alarm name	Cause	Check method	Action
1	PG count error	The gap between the magnetic encoder and detection gear is too large.	Turn the spindle by hand to check the output signal from the magnetic encoder.*1	Adjust the gap between the magnetic encoder and detection gear.
		The magnetic encoder sensor or detection gear is defective.	Turn the spindle by hand to check the output signal from the magnetic encoder.*1	When the magnetic encoder output signal $VZ1 \neq VZ2$: <ul style="list-style-type: none"> • Replace the magnetic encoder sensor. • Detection gear (Z phase disc) external dimensions defect
				When the magnetic encoder output signal $t1 \neq t2$: <ul style="list-style-type: none"> • Replace the magnetic encoder sensor. • Detection gear AB phase gear and Z phase disc assembly accuracy defect
		Noise is superimposed on the magnetic encoder signal wire.	Check whether the magnetic encoder signal wire shield is properly connected.	Replace the magnetic encoder signal wire.
		The magnetic encoder Z phase signal has been lost.	Perform a magnetic encoder signal wire continuity check.	Replace the magnetic encoder signal wire.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

*1 For the method for checking output signals from the magnetic encoder, see Appendix 2.

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Table 4-4 (2/14)

AlarmNo.	Alarm name	Cause	Check method	Action
2	Motor overspeed	The resolver is defective.	Turn the motor by hand to check the output signal from the resolver. *2	Replace the motor.
		The gap between the magnetic encoder and detection gear is too large.	Turn the spindle by hand to check the output signal from the magnetic encoder. *3	Adjust the gap between the magnetic encoder and detection gear.
		The magnetic encoder sensor or detection gear is defective.	Turn the spindle by hand to check the output signal from the magnetic encoder. *3	When the magnetic encoder output signal $VZ1 \neq VZ2$: • Replace the magnetic encoder sensor. • Detection gear (Z phase disc) external dimensions defect
				When the magnetic encoder output signal $t1 \neq t2$: • Replace the magnetic encoder sensor. • Detection gear AB phase gear and Z phase disc assembly accuracy defect
		Noise is superimposed on the magnetic encoder signal wire.	Check whether the magnetic encoder signal wire shield is properly connected.	Replace the magnetic encoder signal wire.
		The connector of the resolver or magnetic encoder signal wire has a contact failure.	Check whether the connector*4 is properly connected to the unit and the motor.	Properly connect the connector.
		The connector of resolver or magnetic encoder signal wire has a contact failure.	Disconnect the resolver or the magnetic encoder signal wire and perform a continuity check	Replace the resolver or magnetic encoder signal wire.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

*2 For the method for checking output signals from the resolver, see Appendix 2.

*3 For the method for checking output signals from the magnetic encoder, see Appendix 2.

*4 Connector names are as shown below.

	Connector name	Connector name
VAC5-D8-AIF	XB-RES(CN3)	XB-EPG(CN13)
VAC5-D11-AIF		
VAC5-D22-AIF		
VAC5-D30-AIF		
VAC5-D6	XB-RES(CN11)	XB-EPG(CN1)
VAC5-D11	XB-RES(CN3)	XB-EPG(CN2)
VAC5-D22		

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Table 4-4 (3/14)

AlarmNo.	Alarm name	Cause	Check method	Action
3	APA speed (spindle overspeed)	The gap between the magnetic encoder and detection gear is too large.	Turn the spindle by hand to check the output signal from the magnetic encoder.*5	Adjust the gap between the magnetic encoder and detection gear.
		The magnetic encoder sensor or detection gear is defective.	Turn the spindle by hand to check the output signal from the magnetic encoder.*5	When the magnetic encoder output signal VZ1 ≠ VZ2: • Replace the magnetic encoder sensor. • Detection gear (Z phase disc) external dimensions defect
				When the magnetic encoder Z phase signal is incorrect. • Detection gear Z phase disc has a scratch.
		Noise is superimposed on the magnetic encoder signal wire.	Check whether the magnetic encoder signal wire shield is properly connected.	Replace the magnetic encoder signal wire.
		The connector of the magnetic encoder has a contact failure.	Properly connect the connector*6.	Properly connect the connector.
		The connector of magnetic encoder signal wire is damaged.	Disconnect the magnetic encoder signal wire and perform a continuity check	Replace the magnetic encoder signal wire.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
4	CON speed	The feed unit quantity is incorrect.	Check the setting of the feed unit.	Correct the set value.
5	DIFF over	The machine is overloaded.	Check for any improper cutting conditions and errors in mechanical components, such as a lubrication unit.	Review the cutting conditions, or remove the cause of the mechanical system error.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

*5 For the method for checking output signals from the magnetic encoder, see Appendix 2.

*6 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-EPG(CN13)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-EPG(CN1)
VAC5-D11	XB-EPG(CN2)
VAC5-D22	

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Table 4-4 (4/14)

AlarmNo.	Alarm name	Cause	Check method	Action
6	Resolver error	The connector of the resolver is inserted into a wrong position on the control PC board.	Check which of the connectors*7 on the control PC board the connector is connected to.	Connect the connector into the correct position.
		The connector of the resolver has a contact failure.	Check whether the connector*7 is properly connected to the unit and the motor.	Properly connect the connector.
		The connector of resolver or magnetic encoder signal wire has a contact failure.	Disconnect the resolver and perform a continuity check	Replace the resolver.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The resolver is faulty.	Make sure that the same alarm number is displayed with a new unit.	Replace the motor.
8	Communication error	The contact of the connector of the optical fiber is incomplete.	Verify that the connector is properly inserted into the connector for optical fiber on the control PC board XB-OPT(CNOFS).	Properly connect the connector.
		Optical fiber cable is damaged.	Check whether the optical fiber cable is damaged*8.	Replace the optical fiber cable.
		NC unit board*9 is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the NC unit board.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

*7 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-RES(CN3)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-RES(CN11)
VAC5-D11	XB-RES(CN3)
VAC5-D22	

*8 For the method for checking optical fiber cable, see Section 5, subsection 9.

*9 OSP5020: SPC6, OSP7000: TFP board

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Table 4-4 (5/14)

AlarmNo.	Alarm name	Cause	Check method	Action
9	Command error	An undefined or inexecutable command was sent.	Check communication causing the alarm.	Correct the NC software.
10	Motor wire overcurrent	The contact between the motor power wire and the terminal block is incomplete.	Verify that the terminal screws are securely tightened.	Securely tighten the terminal screws.
		The motor power wire is broken, short-circuited, or grounded.	Perform a continuity check with the motor power wire disconnected from the drive unit and the motor.	Replace the motor power wire.
		The connector of the resolver has a contact failure.	Check whether the connector*10 is properly connected to the unit and the motor.	Properly connect the connector.
		The motor is faulty.	Measure the insulation between the power wire terminal of the motor and the frame.	Replace the motor.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The power unit is faulty.		

*10 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-RES(CN3)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-RES(CN11)
VAC5-D11	XB-RES(CN3)
VAC5-D22	

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Table 4-4 (6/14)

Alarm No.	Alarm name	Cause	Check method	Action
11	Inverter bridge short	The motor power wire is broken, short-circuited, or grounded.	Perform a continuity check with the motor power wire disconnected from the drive unit and the motor.	Replace the motor power wire.
		The motor is faulty.	Measure the resistance between the power wire terminal of the motor and the frame with a Megger tester.	Replace the motor.
		(Winding changeover type) The magnet switch for winding changeover or the relay for magnet switch drive is faulty.	Inspect the magnet switch or the relay according to the maintenance manual for the machine.	Replace the magnet switch or the relay for magnet switch drive.
		The control PC board or power unit is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
12	Regenerator IGBT short	An instantaneous power failure occurred when the motor was turned off.	Check the power supply.	Turn on the motor after resetting.
		The control PC board or unit is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
13	Power circuit abnormal voltage	The power voltage is unusually high.	See Table 4-1.	See Table 4-1.
		The power wire terminal screw is loose.	Turn off the power. Verify that the power wire terminal screw is securely tightened.	Securely tighten the screws.
		The motor data selection is incorrect.	Check the switch SW1 setting.	Set the switch SW1 correctly.
		The regenerative circuit on the control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The windings inside the motor have shorted.	Measure the resistance between the motor windings.	Replace the motor.
		The power supply impedance is high. (The power supply wiring route is too long.) (The customer has insufficient power supply capacity.)	Verify that alarm 13 is displayed only when the motor decelerates	Shorten the power supply wiring route to the machine. Optimize the power supply capacity.

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Table 4-4 (7/14)

AlarmNo.	Alarm name	Cause	Check method	Action
14 (15)	Input voltage drop or open phase	The power voltage is low, or an open phase occurs.	See Table 4-1.	See Table 4-1.
		One or more of the fuses F1R to F3T is blown.	Check the fuses for blowing.	Replace the blown fuse(s).
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The power unit is faulty.		
The power supply impedance is high. (The power supply wiring route is too long.) (The customer has insufficient power supply capacity.)	Make sure that alarm 14 or 15 is displayed only during the acceleration or deceleration of the motor.	Shorten the power supply wiring route to the machine. Optimize the power supply capacity.		
17	Power circuit low voltage	The power voltage is low.	See Table 4-1.	See Table 4-1.
		The power unit is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

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Table 4-4 (8/14)

AlarmNo.	Alarm name	Cause	Check method	Action
19	Motor overload	The machine is overloaded.	Check the motor temperature.	Review the operation program.
		The contact between the fan power wire and the terminal block is incomplete.	Turn OFF the power and check the terminal block connections at the unit side and motor side.	Properly connect the wires.
		The fan motor wire is damaged.	Turn OFF the power and conduct a continuity check for the fan motor wire.	Replace the motor.
		The motor cooling fan is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the motor cooling fan.
		Dust is accumulated at the motor cooling fan, fan guard, ventilating hole, etc.	Check for dust.	Use the air blast or a vacuum cleaner to remove the dust.
		The connector of the resolver has a contact failure.	Check whether the connector*10 is properly connected to the unit and the motor.	Properly connect the connector.
		The connector of resolver or magnetic encoder signal wire has a contact failure.	Disconnect the resolver and perform a continuity check	Replace the resolver.
		Thermal protector built in the motor is faulty.	Measure the resistance between the connector inside the motor terminal box and the thermal protector terminal. If the measured resistance is \square , the thermal protector is faulty.	Replace the motor.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

*11 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-RES(CN3)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-RES(CN11)
VAC5-D11	XB-RES(CN3)
VAC5-D22	

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Table 4-4 (9/14)

AlarmNo.	Alarm name	Cause	Check method	Action
20	Heat sink overload	The heat sink cooling fan is faulty.	Verify that the heat sink cooling fan starts working when the power is turned on.	Replace the unit.
		The heat sink cooling fan is contaminated with dust.	Check the back of the power unit for contamination.	Clean the heat sink cooling fan by air blowing or using a vacuum cleaner.
		The machine is overloaded.	_____	Review the cutting conditions and tools.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The power unit is faulty.		
21	VAC data settings	VAC PBU data file or NC online parameter values are faulty.	Check VAC PBU data or online change parameters.	Correct wrong data.
22	Excessive in-VAC speed command	Mechanical error	Verify that the mechanical system is in normal condition.	Remove error elements, if any.

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Table 4-4 (10/14)

AlarmNo.	Alarm name	Cause	Check method	Action
23	Magnetic PG error	The connector of the magnetic encoder signal wire is connected into a wrong position on the control PC board.	Check which of the connectors*12 the control PC board the connector is connected to.	Connect the connector into the correct position.
		The contact of the magnetic encoder signal is incomplete.	Check if the connector*12 is properly connected.	Properly connect the connector.
		The gap between the magnetic encoder and detection gear is too large.	Turn the spindle by hand to check the output signal from the magnetic encoder.*13	Adjust the gap between the magnetic encoder and detection gear.
		Noise is superimposed on the magnetic encoder signal wire.	Check whether the magnetic encoder signal wire shield is properly connected.	Replace the magnetic encoder signal wire.
		The connector of magnetic encoder phase A and B signal wire is damaged.	Disconnect the signal wire and perform a continuity check	Replace the magnetic encoder signal wire.
		Magnetic encoder sensor is faulty.	Turn the spindle by hand to check the output signal from the magnetic encoder.*13	• Replace the magnetic encoder sensor.
24	Magnetic PG marker latch data error	The magnetic encoder sensor or detection gear is defective.	Turn the spindle by hand to check the output signal from the magnetic encoder.*13	Replace the magnetic encoder sensor or detection gear.

*12 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-EPG(CN13)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-EPG(CN1)
VAC5-D11	XB-EPG(CN2)
VAC5-D22	

*13 For the method for checking output signals from the magnetic encoder, see Appendix 2.

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Table 4-4 (11/14)

Alarm No.	Alarm name	Cause	Check method	Action
30	Excessive speed deviation	Cutting load is too great.	Check whether the cutting tool cut into the workpiece and stopped during heavy cutting.	Review the cutting conditions and tools.
		The motor power wire is damaged or has a contact failure or the wiring is incorrect.	Check the motor power wire.	Properly connect the motor power wire.
		The resolver signal wire is broken or has a contact failure.	Check the resolver signal wire.	Properly connect the resolver signal wire.
		The magnetic encoder signal wire is broken or has a contact failure.	Check the magnetic encoder signal wire.	Properly connect the magnetic encoder signal wire.
		The motor data selection is incorrect.	Check the switch SW1 setting.	Set the switch SW1 correctly.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The power unit is faulty.		
		The motor is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the motor.
		(Winding changeover type) (Winding changeover type)The winding changeover magnet contactor or drive relay is faulty.	Refer to the maintenance manual provided with this machine and perform an inspection.	Replace the winding changeover magnet switch or drive relay.
31	Winding changeover error	Winding changeover magnet contactor or drive relay error	Refer to the maintenance manual provided with this machine and perform an inspection.	Replace the winding changeover magnet switch or drive relay.
		The I/O control circuit signal wire is damaged or has a contact failure.	Check I/O control circuit signal wire.	Properly connect the wire.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
32	RAM error	The control PC board is faulty.	—————	Replace the unit.
41	Converter link error	The power unit is faulty.	—————	Replace the unit.

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Table 4-4 (12/14)

Alarm No.	Alarm name	Cause	Check method	Action
42	Abnormal inverter DC bus voltage	The power voltage is unusually high.	See Table 4-1.	See Table 4-1.
		The power wire terminal screw is loose.	Turn the power OFF and verify that the power wire terminal screw is securely tightened.	Securely tighten the screws.
		The power supply impedance is high. (The power supply wiring route is too long.) (The customer has insufficient power supply capacity.)	Verify that alarm 42 is displayed only when the motor decelerates	Shorten the power supply wiring route to the machine. Optimize the power supply capacity.
		The power voltage is low, or an open phase occurs.	See Table 4-1.	See Table 4-1.
		The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
		The power unit is faulty.		
47	Unit settings	Unit settings are faulty.	Check the switch settings.	Set the switches correctly.
48	Motor data settings	Motor data settings are faulty.	Check the switch settings.	Set the switches correctly.
49	Unit/motor data settings	The unit settings and data settings do not match.	Check the switch settings.	Set the switches correctly.
50	Self-diagnosis error	The control PC board is faulty.	—————	Replace the unit.

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Table 4-4 (13/14)

Alarm No.	Alarm name	Cause	Check method	Action
51	Control board error	The control PC board is faulty.		
		One or more of the board-to-board connectors connecting the control PC board and the power unit is improperly inserted.		
52	Abnormal control voltage ± 12 V/+24 V	The control PC board is faulty.	-----	Replace the unit.
53	OPF error			
58	Abnormal power for magnetic encoder			
59	Abnormal power for encoder			
60	Abnormal control power + 3.3 V			
61	Abnormal control power 5 V			
62	Gate signal error			
70	IR1 MAIN loop error			
71	IR2 MAIN loop error			
72	INT4 loop error			
73	INT3 loop error			
74	INT2 loop error			
75	IR3 MAIN loop error			
76	Access error			
78	Parity error			
79	Watchdog error			

Table4-4 (14/14)

Alarm No.	Alarm name	Cause	Check method	Action
80	IRQ7 interrupt IRQ4 interrupt	The control PC board is faulty.	-----	Replace the unit.
81	NMI interrupt			
82	General imparity command			
83	Slot imparity command			
84	CPU address error			
85	DMA address error DMAC/DTC address error			
86	Undefined trap command			
87	Undefined interrupt			
88	DMAC			
89	ITU MTU			
90	SCI			
91	REF BSC			
92	A/D			
93	System reserve			
94	User break			
95	DTC			
96	CMT			
97	I/O			

2-3. The motor hunts

Table 4-5

Cause	Check method	Action
The resolver signal wire has a contact failure or is connected to a incorrect terminal.	Check the resolver signal wire.	Properly connect the resolver signal wire.
The motor power wire has a contact failure or is connected to a incorrect terminal.	Check the motor power wire.	Properly connect the motor power wire.
The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
The power unit is faulty.		
(Winding changeover type) The motor power wire is not properly connected to the magnet contactor for high speed/low speed.	Refer to the maintenance manual provided with this machine and inspect the magnet contactor.	Replace the magnet contactor.
(Winding changeover type) The motor power wire is not properly connected to the magnet contactor for high speed/low speed.	Refer to the electric drawing provided with this machine and inspect the magnet contactor related wiring.	Properly connect the magnet contactor related wiring.

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2-4. The motor does not run at the specified speed, or the motor does not rotate.

Table 4-6

Cause	Check method	Action
The machine ready complete signal has been lost.	Check if the connector*1 is properly connected.	Properly connect the connector.
	Check the signal (MRDY, MRDY-COM) continuity.	Replace the signal cable.
An alarm occurred at the unit.	Seven-segment LED shows an error if a rotation command is specified.	See subsection 2-2.
The motor power wire is damaged or has a contact failure or the wiring is incorrect.	Check the motor power wire.	Properly connect the wire.
The resolver is faulty.	Check the signal from the resolver.*2	Replace the motor.
The magnetic encoder unit is faulty.	Check the output signal from the magnetic encoder.*3	Replace the magnetic encoder sensor.
The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
The power unit is faulty.		
(Winding changeover type) The winding changeover magnet switch or drive relay is faulty.	Refer to the maintenance manual provided with this machine.	Replace the winding changeover magnet switch or drive relay.

*1 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-EX(CN1)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-CHG(CN12)
VAC5-D11	XB-CHG(CN1)
VAC5-D22	

*2 For the method for checking output signals from the resolver, see Appendix 2.

*3 For the method for checking output signals from the magnetic encoder, see Appendix 2.

CAUTION

For the winding changeover type, issue a winding command and speed command within the permissible rotation range for both the high-speed winding and low-speed winding.

High-speed winding: 0 – max. no. of motor rotations

Low-speed winding: 0 – max. no. of rotations for low-speed winding

Refer to the instruction manual provided with the machine for more specific values.

2-5. The cutting force has dropped.

Table 4-7

Cause	Check method	Action
A torque limit command is applied.	-----	Cancel the torque limit command.
The cause of the problem exists close to the spindle of the machine.	Refer to the maintenance manual provided with this machine.	Refer to the maintenance manual provided with this machine.
The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.

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2-6. The acceleration or deceleration time has increased.

Table 4-8

Cause	Check method	Action
The load is heavy.	Check the load (value) displayed on the NC screen.	Remove the cause of the heavy load.
A torque limit command is applied.	—————	Cancel the torque limit command
The power voltage is high.	See Table 4-1.	See Table 4-1.
The motor power wire is damaged or has a contact failure.	Check the motor power wire.	Properly connect the wire.
The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
The power unit is faulty.		
The power supply impedance is high.	Only the deceleration time increases. Refer to the instruction manual provided with the machine.	Shorten the power supply wiring route to the machine. Optimize the power supply capacity.

2-7. Vibration or noise is strong when the motor is running.

As a method for locating whether the cause of a problem is present in the electric or mechanical system, run the motor free (uncontrolled state). Follow the procedure described below to run the motor free.

If “vibration or noise is still strong” even if the motor is running free, the cause of the problem lies in the mechanical system, not the electric system.

- (1) Run the motor with a rotation command given to it.
- (2) Disconnect the optical fiber connector XB-OPT (CNOFS) of the drive unit.
- (3) A communication error alarm is issued, and the motor starts to run free.

Table 4-9

Cause	Check method	Action
The mounting of the motor is improper.	Check the motor to see if it is properly mounted and coupled with the spindle.	Mount or couple the motor with the spindle from the beginning.
The resolver signal wire is broken or has a contact failure.	Check the resolver signal wire.	Replace the resolver.
When using VAC1 system Noise is superimposed on the magnetic encoder signal wire.	Check the control signal wire shielding.	Replace the control signal wire.
The control PC board is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the unit.
The power unit is faulty.		
The motor is faulty.	Verify that all of the check points above are showing the proper values or properly set.	Replace the motor.



When the motor is running in neutral (uncontrolled state), stay away from the rotating part of the motor.



Exercise care not to apply excessive force to the root of the optical fiber connector XB-OPT (CNOFS) of the drive unit when disconnecting it. Failure to follow this instruction will cause the optical fiber to break.

Failure to follow this instruction will cause the optical fiber to break.

SECTION 4 TROUBLESHOOTING

2-8. The motor decelerates suddenly and stops even although no alarm has occurred.

Table 4-10

Cause	Check method	Action
The machine ready complete signal has been lost.	Check if the connector*1 is properly connected.	Properly connect the connector.
	Check the signal (MRDY, MRDY-COM) continuity.	Replace the signal cable.

*1 Connector names are as shown below.

	Connector name
VAC5-D8-AIF	XB-EX(CN1)
VAC5-D11-AIF	
VAC5-D22-AIF	
VAC5-D30-AIF	
VAC5-D6	XB-CHG(CN12)
VAC5-D11	XB-CHG(CN1)
VAC5-D22	

3. Recovery from errors

If the seven-segment LED display is indicating an error, it is necessary to remove the cause of the error and reset the alarm to recover from that error status.

Alarms are classified into four levels shown in the table below according to the processing in case of an alarm and the recovering method.

Table 4-11

Alarm level	Processing in case of alarm	Recovering method	Nature of alarm
Level 1a	The unit goes into alarm level 1 mode. [Immediately shutoff]	Turn the machine power supply breaker OFF and then ON again, and start up the NC.	An alarm, such as that detected by the CPU itself (exception), that requires hardware initialization.
Level 1b	The unit goes into alarm level 1 mode. [The shutoff of the current after deceleration to a stop is standard processing.]	Turn off the NC power, and turn it on again to restart the NC.	An alarm that requires the initialization of parameters, etc.
Level 2	The unit goes into an alarm status in the main mode*1 in which the alarm was issued. [The processing depends on the main mode in which an alarm is issued.]	Press the reset button on the NC operation panel. [A reset command will be issued in each mode.]	An alarm that may occur under certain cutting conditions, such as DIFF over.
Level 3	The unit informs the NC of the issuance of alarm level 3, remains in normal operation for 30 seconds, and goes into alarm level 2.	Press the reset button on the NC operation panel. [A reset command will be issued in each mode.]	An overload-related alarm.

*1 "Main mode" means velocity control mode (the mode executed with a regular S command) or position control mode (the mode for C-axis control).