

TROUBLESHOOTING AND ACTION

FANUC ALPHA-*i* SERIES SPINDLE AMPLIFIER MODULE

Model	Order Specification
SPM-2.2 <i>i</i>	A06B-6111-H002
SPM-5.5 <i>i</i>	A06B-6111-H006
SPM-11 <i>i</i>	A06B-6111-H011
SPM-15 <i>i</i>	A06B-6111-H015
SPM-22 <i>i</i>	A06B-6111-H022
SPM-26 <i>i</i>	A06B-6111-H026
SPM-30 <i>i</i>	A06B-6111-H030
SPM-2.2 <i>i</i>	A06B-6112-H002
SPM-5.5 <i>i</i>	A06B-6112-H006
SPM-11 <i>i</i>	A06B-6112-H011
SPM-15 <i>i</i>	A06B-6112-H015
SPM-22 <i>i</i>	A06B-6112-H022
SPM-26 <i>i</i>	A06B-6112-H026
SPM-30 <i>i</i>	A06B-6112-H030

If an alarm occurs in the spindle amplifier module, the ALM LED lights red in the STATUS display, and the two-digit 7-segment LEDs indicate the alarm code. The ALM LED lights red.

Alarm Code 01

The inside temperature of the motor is higher than the specified temperature.

(1) If this alarm is issued during cutting (the motor temperature is high)

(a) Check the cooling state of the motor.

<1> If the cooling fan of the spindle motor is stopped, check the power supply of the cooling fan. If the cooling fan is still inoperative, replace it with a new one.

<2> When a liquid-cooled motor is used, check the cooling system.

<3> When the ambient temperature of the spindle motor is higher than the specified temperature, lower the ambient temperature to satisfy the specification.

(b) If this alarm is issued even when the load meter fluctuates in a limited range, check the short-period rating. If the specified value is exceeded, reduce the load.

(2) If this alarm is issued under a light load (the motor temperature is high)

(a) When the frequency of acceleration/deceleration is too high set such a condition that the average including output at acceleration/deceleration does not exceed the continuous rating.

(b) The parameters specific to the motor are not correctly. Referring to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," check the motor-specific parameters.

(3) If this alarm is issued when the motor temperature is low

(a) The spindle motor feedback cable is faulty. Replace the cable.

(b) The control printed circuit board is faulty. Replace the control printed circuit board or spindle amplifier.

(c) The motor (internal thermostat) is faulty. Replace the motor.

Alarm Code 02

The actual motor speed is largely deviated from the commanded speed.

(1) If this alarm is issued during motor acceleration

(a) The parameter setting of acceleration/deceleration time is incorrect. Set the following parameter with the actual acceleration/deceleration time for your machine plus some margin.

Fanuc-15i PRM 3082 or Fanuc-16i/18i/21i PRM 4082
Setting of acceleration/deceleration time

(b) The parameter for the speed detector is not set correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and set a correct value.

(2) If this alarm is issued at a heavy cutting load

(a) The cutting load has exceeded the motor output power. Check the load meter indication, and review the use condition.

(b)The parameters for output restriction are not set correctly. Check that the settings of the following parameters satisfy the machine and motor specifications:

Fanuc-15i PRM 3028 Fanuc-16i/18i/21i PRM 4028

Output restriction pattern setting

Fanuc-15i PRM 3029 Fanuc-16i/18i/21i PRM 4029

Output restriction value

(c)The parameters specific to the motor are not correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the motor-specific parameters.

Alarm Code 03

The fuse of the DC link has blown. (The voltage at the DC link is insufficient.) This alarm is checked when emergency stop is cancelled.

(1)If this alarm is issued during spindle operation (rotation) The fuse of the DC link inside the SPM has probably blown. So, replace the SPM. This alarm may be caused by the following:

<1>Power lead short-circuited to ground

<2>Motor winding short-circuited to ground

<3>IGBT or IPM module failure

(2) If the PSM input magnetic contactor is once turned on and is turned off with this alarm when emergency stop is cancelled or the CNC is started (When two spindles are connected, the magnetic contactor may not be turned off.)

(a)The DC link wire is not connected. Check the DC link wiring for errors.

(b)A cable is faulty. Pin 9 of the interface cable (CXA2B-CXA2A) between the PSM and SPM may be short-circuited to 0V. Replace the cable.

(c)The fuse of the DC link inside the SPM has blown. Replace the SPM.

Alarm Code 06

The temperature sensor is abnormal, or the temperature sensor cable is broken.

(1)The parameters specific to the motor are not correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the motor-specific parameters.

(2)Cable is faulty. Feedback cable is faulty. Replace the cable. (3)A thermo sensor is faulty. Replace the motor (thermo sensor).

Alarm Code 07

The motor rotates at a speed exceeding 115% (standard setting) of the maximum allowable speed.

(1)If this alarm is issued during spindle synchronization If one of the motors operating in spindle synchronization is deactivated (SFR or SRV) and activated again, the spindle motor may accelerate to its maximum rotation speed in order to eliminate the position error accumulated while the motor is off, resulting in this alarm being issued. Modify the ladder in such a way that this sequence will not be used.

(2)If this alarm is issued while the motor is stopped

(a)The connection cable of the spindle sensor is faulty. Check that the cable of the spindle sensor leading to the motor is intact. Replace the cable if necessary.

(b)The motor is vibrating. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and adjust the parameters (4040 to 4055 for the FS16i and 3040 to 3055 for the FS15i) related to the velocity loop gain.

(c)The spindle sensor is not adjusted correctly. Adjust the sensor.

Alarm Code 09

The temperature of the heat sink of the SPM main circuit has risen abnormally. This alarm is issued for SPM-15i and later. With SPM-2.2i to SPM-11i, however, alarm code 12 is issued for the same cause.

(1) If this alarm is issued during cutting (the heat sink temperature is high)

(a) If this alarm is issued when the load meter reads a value below the continuous rating of the amplifier, check the cooling state of the heat sink.

<1> If the cooling fan is stopped, check the power supply (connector CX1A/B). If the cooling fan is still inoperative, replace the SPM with a new one.

<2> When the ambient temperature is higher than the specified temperature, lower the ambient temperature to satisfy the specification.

(b) When this alarm is issued because the load meter reads a value above the continuous rating of the amplifier, improve the use method.

(c) When the heat sink on the back of the amplifier is too dirty, clean the heat sink, for example, by blowing air. Consider the use of a structure that prevents the heat sink from being directly exposed to coolant.

(2) If this alarm is issued under a light load (the heat sink temperature is high)

(a) When the frequency of acceleration/deceleration is too high, modify the cutting condition so that the average including output at acceleration/deceleration does not exceed the continuous rating.

(b) The parameters specific to the motor are not set correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)."

(3) If this alarm is issued when the heat sink temperature is low. Replace the SPM.

Alarm Code 12

An excessively large current flowed into the DC link of the main circuit. With SPM-2.2i to SPM-11i, this alarm indicates that the power module (IPM) of the main circuit detected an error such as an excessive load, over current.

(1) If this alarm is issued on SPM-2.2i to SPM-11i Check alarm code 09 as well.

(2) If this alarm is issued immediately after a spindle rotation command is specified.

(a)The motor power lead is faulty. Check for a short circuit between motor power leads and short-circuit to ground, and replace the power lead as required.

(b)The motor winding has an insulation failure. If the motor is short-circuited to ground, replace the motor.

(c)The parameters specific to the motor are not set correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," check the motor-specific parameters.

(d)The SPM is faulty. A power element (IGBT, IPM) may be destroyed. Replace the SPM.

(3)If this alarm is issued during spindle rotation

(a)A power element is destroyed. A power element (IGBT, IPM) may be destroyed. Replace the SPM. If the amplifier setting condition is not satisfied, or cooling is insufficient because the heat sink is dirty, the power elements may be destroyed. When the heat sink on the back of the amplifier is too dirty, clean the heat sink, for example, by blowing air. Consider the use of a structure that prevents the heat sink from being directly exposed to coolant. For the installation condition, refer to "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)."

(b)The parameters specific to the motor are not set correctly. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameters specific to the motor.

(c)Speed sensor signal error Check the spindle sensor signal waveform. If an error is found, make an adjustment or replace the sensor as required.

Alarm Code 15

In output switching control or spindle switching control, the switching operation sequence was not executed correctly. This alarm is issued if one second or more elapses from the transition of a switch request signal (SPSL or RSL) until a power lead state check signal (MCFN, MFNHG, RCH, or RCHHG) makes a transition.

(1)Troubleshooting when this alarm is issued

(a)The magnetic contactor (switch unit) for power lead switching is faulty. If the contact is inoperative, check the power supply of the magnetic contactor. If the magnetic contactor is still inoperative, replace the magnetic contactor.

(b)The I/O unit or wiring for checking the contact of the magnetic contactor is faulty. If a defect is found in the I/O unit or wiring, replace the I/O unit or wiring.

(c)The sequence (ladder) is incorrect. Modify the sequence so that switching is completed within 1 second.

Alarm Code 18

A sum check is abnormal. If this alarm is issued, replace the SPM or SPM control printed-circuit board.

Alarm Codes 19 and 20

The offset voltage of the phase U (alarm code 19) or phase V (alarm code 20) current detection circuit is excessively high. A check is made when the power is turned on. If this alarm is issued, replace the SPM. If this alarm is issued immediately after the SPM control printed circuit board is replaced, check the plugging of the connectors between the power unit and SPM control printed circuit board.

Alarm Code 21

The specified polarity of the position sensor is incorrect. Troubleshooting when this alarm is issued

(a)Check the position sensor polarity parameter (bit 4 of parameter No. 4001).

(b)Check the feedback cable of the position sensor.

Alarm Code 24

The power to the CNC is turned off. (This symptom does not represent an error.) Serial communication data transferred between the CNC and spindle amplifier module contains an error. Troubleshooting when this alarm is issued

(a)Noise occurring between the CNC and spindle amplifier module (connected via an electric cable) caused an error in communication data. Check the condition for maximum wiring length. Referring to

"Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the condition of electric cable connection.

(b) Noise exercises an influence because a communication cable is bundled with the power lead. If a communication cable is bundled with the power lead for the motor, separate them from each other.

(c) A cable is faulty. Replace the cable. If an optical I/O link adapter is used, the optical link adapter or optical cable may be faulty.

(d) The SPM is faulty. Replace the SPM or SPM control printed circuit board.

(e) The CNC is faulty. Replace the board or module related to the serial spindle.

Alarm Code 27

The signal of the position coder is disconnected.

(1) If this alarm is issued when the motor is deactivated

(a) The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b) The cable is disconnected. If the connection of the feedback cable is correct, replace the cable.

(c) The SPM is faulty. Replace the SPM or SPM control printed circuit board.

(2) If this alarm is issued when the cable is moved

(a) The connector has a bad contact, or the cable is disconnected. The conductor may be broken. Replace the cable. If coolant has penetrated into the connector, clean the connector.

(3) If this alarm is issued when the motor rotates

(a) The shielding of the cable between the sensor and the SPM is faulty. Referring to, "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(b)The signal cable is bundled with the servo motor power lead. If the cable between the sensor and the SPM is bundled with the servo motor power lead, separate them from each other.

Alarm Code 29

An excessive load (standard setting: load meter reading of 9 V) has been applied continuously for a certain period (standard setting: 30 seconds).

(1)If this alarm is issued during cutting Check the load meter, and review the cutting condition.

(2)If this alarm is issued during a stop

(a)The spindle is locked. Check the sequence to see if the spindle is locked when a command for very slow movement is specified or orientation is specified for the spindle.

(3)If the spindle does not rotate as specified (the spindle rotates at a very low speed) and this alarm is issued

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b)The phase sequence of the motor power lead is incorrect.

(c)The feedback cable of the motor has a problem. Check if the phase A/B signals are connected correctly.

(d)The feedback cable of the motor is faulty. Rotate the motor manually to see if a speed is indicated in the item of motor speed on the CNC diagnosis screen or on the spindle check board. If no speed indication is provided, replace the cable or spindle sensor (or motor).

(4)If the spindle does not rotate as specified (the spindle does not rotate at all) and this alarm is issued

(a)The power lead is abnormal. Check if the motor power lead is connected normally. If spindle switching or output switching is performed, check if the magnetic contactor is on.

(b)The SPM is faulty. Replace the SPM.

Alarm Code 31

The motor failed to rotate as specified, and has stopped or is rotating at a very low speed.

(1) If the motor rotates at a very low speed and this alarm is issued

(a) The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b) The motor phase sequence is incorrect. Check if the motor phase sequence is correct.

(c) The feedback cable of the motor has a problem. Check if the phase A/B signals are connected correctly.

(d) The feedback cable of the motor is faulty. Rotate the motor manually to see if a speed is indicated in the item of motor speed on the CNC diagnosis screen or on the spindle check board. If no speed indication is provided, replace the cable or spindle sensor (or motor).

(2) If the motor does not rotate at all and this alarm is issued

(a) The sequence for locking the spindle is incorrect. Check the sequence to see if the spindle is locked.

(b) The power lead is faulty. Check if the power lead is connected to the motor correctly. If spindle switching or winding switching is performed, check if the magnetic contactor is on.

(c) The SPM is faulty. Replace the SPM.

Alarm Code 32

LSI memory for serial communication is abnormal. A check is made when the power is turned on. If this alarm is issued, replace the SPM or SPM control printed circuit board.

Alarm Code 34

Parameter data outside the specifiable range was set. Troubleshooting when this alarm is issued Connect the spindle check board. The spindle check

board displays "AL-34" and "F-xxx" alternately. "F-xxx" indicates a parameter number outside the specifiable range. For the correspondence between the CNC parameter numbers and "F-xxx," refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)."

Alarm Code 36

The error counter overflowed.

(1)The setting of a parameter is incorrect.

(a)The gear ratio set in a parameter is incorrect. Check if an excessively large gear ratio is set.

(b)The setting of a position gain is incorrect. If the gear ratio data is correct, increase the position gain.

Fanuc-15i PRM 3056 to 3059

Fanuc-16i/18i/21i PRM 4056 to 4059

Gear ratio between the spindle and motor

Fanuc-15i PRM 3060 to 3063

Fanuc-16i/18i/21i PRM 4060 to 4063

Position gain at orientation

Fanuc-15i PRM 3065 to 3068

Fanuc-16i/18i/21i PRM 4065 to 4068

Position gain in the servo mode/spindle synchronization

Fanuc-15i PRM 3069 to 3072

Fanuc-16i/18i/21i PRM 4069 to 4072

Position gain in Cs contour control

(2)Sequence error

(a)Check if the motor is deactivated (by turning off SFR/SRV) in a position control mode (rigid tapping, Cs contour control, or spindle synchronization).

Alarm Code 37

After emergency stop signal input, the motor is accelerated without being decelerated. This alarm is issued also when the motor is not deactivated (the motor is not decelerated completely) when the acceleration/deceleration time (initial parameter setting: 10 seconds) has elapsed after emergency stop signal input.

Troubleshooting when this alarm is issued

(a)The parameter setting of the speed detector is incorrect. Referring to Chapter 1 in "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," set a correct time.

(b)The parameter setting of an acceleration/deceleration time is not proper. Check the parameter-set value and actual acceleration/ deceleration time, then set an actual acceleration/deceleration time plus some margin.

Fanuc-15i PRM 3082

Fanuc-16i/18i/21i PRM 4082

Acceleration/deceleration time setting

Alarm Code 41

The position where the one-rotation signal of the position coder is generated is incorrect.

Troubleshooting when this alarm is issued

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b)The position coder is faulty. Check the check pin PSD on the spindle check board. If the signal is not generated per rotation, replace the position coder.

(c)The shielding of the cable between the sensor and SPM is faulty. Referring to "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(d)The signal cable is bundled with the servo motor power lead. If the cable between the sensor and SPM is bundled with the servo motor power lead, separate them from each other.

(e)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 42

The one-rotation signal of the position coder is not generated.

Troubleshooting when this alarm is issued

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b)The position coder is faulty. Check the check pin PSD on the spindle check board. If the signal is not generated per rotation, replace the connection cable and position coder.

(c)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 46

The one-rotation signal of the position coder cannot be detected normally during thread cutting.

Troubleshoot as in the case of alarm code 41.

Alarm Code 47

The count value of position coder signal pulses is abnormal. Phases A and B for the position coder have a feedback pulse count of 4096 p/rev per spindle rotation. The SPM checks the pulse counts of phases A and B equivalent to the position coder each time a one-rotation signal is generated. The alarm is issued when a pulse count beyond the specified range is detected.

(1)If this alarm is issued when the cable is moved (as in the case where the spindle moves) The conductor may be broken. Replace the cable. If coolant has penetrated into the connector, clean the connector.

(2)Troubleshooting in other cases

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b)The shielding of the cable between the sensor and SPM is faulty. Referring to "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(c)The signal cable is bundled with the servo motor power lead. If the cable between the sensor and SPM is bundled with the servo motor power lead, separate them from each other.

(d)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 50

A value obtained by internal calculation in spindle synchronization exceeded the allowable range.

Troubleshooting when this alarm is issued

(a)The setting of parameters for gear ratio setting is incorrect.
Check if an excessively large gear ratio is set.

(b)Position gain setting limit If correct gear ratio data is set,
increase the position gain value in spindle synchronization.

Fanuc-15i PRM 3056 to 3059

Fanuc-16i/18i/21i PRM 4056 to 4059

Gear ratio between the spindle and motor

Fanuc-15i PRM 3065 to 3068

Fanuc-16i/18i/21i PRM 4065 to 4068

Position gain in the servo mode/spindle synchronization

Alarm Codes 52 and 53

The synchronization signal (ITP) in communication data transferred to and from the CNC stopped.

Troubleshooting when this alarm is issued

(a)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

(b)The CNC is faulty. Replace the board or module related to the serial spindle.

Alarm Code 54

A large current flowing in the motor for a long time was detected.

Troubleshoot as in the case of alarm code 29.

Alarm Code 55

In spindle switching control or output switching control, a mismatch between the switching request signal (SPSL or RSL) and the power lead state check signal (MCFN, MFNHG, RCH, or RCHHG) continues during motor activation.

Troubleshooting when this alarm is issued

(a)The magnetic contactor (switch unit) for power lead switching is faulty. If the contact is inoperative, check the power supply of the magnetic contactor. If the magnetic contactor is still inoperative, replace the magnetic contactor.

(b)The I/O unit or wiring for checking the contact of the magnetic contactor is faulty. If a defect is found in the I/O unit or wiring, replace the I/O unit or wiring.

(c)The sequence (ladder) is incorrect. Modify the sequence so that switching is not performed during activation. For details of the signals, refer to "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)."

Alarm Code 56

The cooling fan for the control circuit section has stopped. When this alarm is issued, replace the SPM or SPM control printed circuit board.

Alarm Code 66

An error occurred during communication between spindle amplifiers.
Troubleshooting when this alarm is issued

(a)Check the connection between the spindle amplifiers.

(b)Replace the cable.

Alarm Code 73

The signal of the motor sensor is disconnected.

(1)If this alarm is issued when the motor is deactivated

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b)The cable is disconnected. Replace the cable.

(c)The sensor is not adjusted correctly. Adjust the sensor signal. If the sensor signal cannot be adjusted correctly, or the sensor signal is not observed, replace the connection cable and sensor.

(d)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

(2) If this alarm is issued when the cable is moved (as in the case where the spindle moves). The conductor may be broken. Replace the cable. If coolant has penetrated into the connector, clean the connector.

(3)If this alarm is issued when the motor rotates

(a)The shielding of the cable between the sensor and the SPM is faulty. Referring to, "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(b)The signal cable is bundled with the servo motor power lead. If the cable between the sensor and the SPM is bundled with the servo motor power lead, separate them from each other.

Alarm Code 74

The CPU test failed to end normally. When this alarm is issued, replace the SPM or SPM control printed circuit board.

Alarm Code 75

An error occurred in the CRC test. When this alarm is issued, Replace the SPM or SPM control printed circuit board.

Alarm Code 79

An abnormal operation was detected in the initial test. When this alarm is issued, replace the SPM or SPM control printed circuit board.

Alarm Code 81

The position where the one-rotation signal of the motor sensor is generated is incorrect.

(1)If the external one-rotation signal is used

(a)The settings of parameters are incorrect. Check that the gear ratio data matches the specification of the machine.

Fanuc-15i PRM 3171 3173 Fanuc 16i/18i/21i PRM 4171 4173
Denominator of gear ratio between motor sensor and spindle

Fanuc-15i PRM 3172 3174 Fanuc 16i/18i/21i PRM 4172 4174
Numerator of gear ratio between motor sensor and spindle

(b) Slippage between the spindle and motor. Check that there is no slippage between the spindle and motor. The external one-rotation signal is not applicable to V-belt connection.

(2) Troubleshooting in other cases

(a) The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," and check the parameter for sensor setting.

(b) A sensor (MZi sensor or BZi sensor) is not adjusted correctly. Adjust the sensor signal. If the sensor signal cannot be adjusted correctly, or the sensor signal is not observed, replace the connection cable and sensor.

(c) The shielding of the cable between the sensor and SPM is faulty. Referring to "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(d) The signal cable is bundled with the servo motor power lead. If the cable between the sensor and SPM is bundled with the servo motor power lead, separate them from each other.

(e) The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 82

The one-rotation signal of the motor sensor is not generated.

Troubleshooting when this alarm is issued

(a) The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," check the parameter for sensor setting.

(b)The MZi sensor or BZi sensor is not adjusted correctly. Adjust the sensor. If the sensor cannot be adjusted or the signal is not observed, replace the connection cable and sensor.

(c)The external one-rotation signal is faulty. Check the check pin EXTSC1 on the spindle check board. If the signal is not generated per rotation, replace the connection cable and position coder. (

(d)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 83

The SPM checks the pulse counts of phases A and B each time a one-rotation signal is generated. The alarm is issued when a pulse count beyond the specified range is detected.

(1) If this alarm is issued when the cable is moved (as in the case where the spindle moves) The conductor may be broken. Replace the cable. If coolant has penetrated into the connector, clean the connector.

(2)Troubleshooting in other cases

(a)The setting of a parameter is incorrect. Refer to "FANUC AC SPINDLE MOTOR i series Parameter Manual (B-65280EN)," check the parameter for sensor setting.

(b)The MZi sensor or BZi sensor is not adjusted correctly. Adjust the sensor. If the sensor cannot be adjusted or the signal is not observed, replace the connection cable and sensor.

(c)The shielding of the cable between the sensor and SPM is faulty. Referring to "Connection," in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the shielding of the cable.

(d)The signal cable is bundled with the servo motor power lead. If the cable between the sensor and SPM is bundled with the servo motor power lead, separate them from each other.

(e)The SPM is faulty. Replace the SPM or SPM control printed circuit board.

Alarm Code 84

The spindle sensor signal was disconnected. Refer to Alarm Code 73 for this alarm trouble shooting.

Alarm Code 85

The one-rotation signal of the spindle sensor occurred in an incorrect location. Refer to Alarm Code 81 for this alarm trouble shooting.

Alarm Code 86

No spindle sensor one-rotation signal occurred. Refer to Alarm Code 82 for this alarm trouble shooting.

Alarm Code 87

A spindle sensor signal is abnormal. Refer to Alarm Code 83 for this alarm trouble shooting.

Alarm Code 88

The heat sink cooling fan is not running. If this alarm is issued, replace the SPM heat sink cooling fan.

Alarm Codes A, A1, and A2

The control program is not running. An error was detected when the control program was running.

(1) If this alarm is issued when the spindle amplifier power is switched on

(a) Wrong software specification

(b) Defective printed-circuit board Replace the SPM or SPM control printed-circuit board.

(2) If this alarm is issued when the motor is active.

(a)Influence by noise Referring to "Installation" in "FANUC SERVO AMPLIFIER i series Descriptions (B-65282EN)," check the grounding wire. If the spindle sensor signal wire is bundled together with any motor power wire, separate them.

Alarm Code b0

An error occurred in communication between amplifier modules (SPM and PSM).

Troubleshooting when this alarm is issued

(a)The cable is defective. If the connection is correct, replace the cable. (b)The SPM or PSM is defective. Replace the SPM, PSM, SPM control printed-circuit board, or PSM control printed-circuit board.

Alarm Codes C0,C1, and C2

An error occurred in serial communication data between the CNC and spindle amplifier module.

Troubleshooting when this alarm is issued

(a)The SPM is defective. Replace the SPM or SPM control printed-circuit board.

(b)The CNC is defective. Replace the board or module related to the serial spindle.