

6 Troubleshooting and Solutions

6.1 Fault Codes and Solutions

Troubleshoot the faults occurred during operating the AC drive as follows.

Fault Code	Fault Name	Possible Cause	Solution
Err02	Overcurrent during acceleration	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		The acceleration time is too short.	Increase the acceleration time.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (F3-19 = 1). The setting of F3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of F3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		Customized torque boost or V/F curve is not appropriate.	Adjust the customized torque boost or V/F curve.
		The motor is started while spinning.	Enable the catching a spinning motor function or start the motor after it stops spinning.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the drive board or Hall element may be faulty.

Fault Code	Fault Name	Possible Cause	Solution
Err03	Overcurrent during deceleration	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set the motor parameters according to the motor nameplate and perform motor auto-tuning.
		The deceleration time is too short.	Increase the deceleration time.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (F3-19 = 1). The setting of F3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of F3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the drive board or Hall element may be faulty.
Err04	Overcurrent at constant speed	A grounding fault or short circuit exists in the output circuit.	Check whether short-circuit occurs on the motor, motor cable, or contactor.
		The control mode is SVC or FVC but motor auto-tuning is not performed.	Set motor parameters according to the motor nameplate and perform motor auto-tuning.
		The overcurrent stall prevention parameters are set improperly.	Ensure that current limit is enabled (F3-19 = 1). The setting of F3-18 (Current limit level) is too large. Adjust it between 120% and 150%. The setting of F3-20 (Current limit gain) is too small. Adjust it between 20 and 40.
		The AC drive power class is small.	If the output current exceeds the rated motor current or rated output current of the AC drive during stable running, use an AC drive of larger power class.
		The AC drive suffers external interference.	View historical fault records. If the current value is far from the overcurrent level, find the interference source. If an external interference does not exist, the drive board or Hall element may be faulty.

Fault Code	Fault Name	Possible Cause	Solution
Err05	Overvoltage during acceleration	The input voltage is too high.	Adjust the input voltage to the normal range.
		An external force drives the motor during acceleration.	Cancel the external force or install a braking resistor.
		The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (F3-23 = 1). The setting of F3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of F3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
		The acceleration time is too short.	Increase the acceleration time.
Err06	Overvoltage during deceleration	The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (F3-23 = 1). The setting of F3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of F3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50.
		An external force drives the motor during deceleration.	Cancel the external force or install a braking resistor.
		The deceleration time is too short.	Increase the deceleration time.
		The braking unit and braking resistor are not installed.	Install the braking unit and braking resistor.
Err07	Overvoltage at constant speed	The overvoltage stall prevention parameters are set improperly.	Ensure that the voltage limit function is enabled (F3-23 = 1). The setting of F3-22 (Voltage limit) is too large. Adjust it between 700 V and 770 V. The setting of F3-24 (Frequency gain for voltage limit) is too small. Adjust it between 30 and 50. The setting of F3-26 (Frequency rise threshold during voltage limit) is too small. Adjust it between 5 Hz and 20 Hz.
		An external force drives the motor during acceleration.	Cancel the external force or install a braking resistor.
Err08	Pre-charge power fault	The bus voltage fluctuates around the undervoltage threshold continuously.	Contact the agent or Inovance.

Fault Code	Fault Name	Possible Cause	Solution
Err09	Undervoltage	An instantaneous power failure occurs.	Enable the power dip ride through function (F9-59 \neq 0).
		The AC drive's input voltage is not within the permissible range.	Adjust the voltage to the normal range.
		The bus voltage is abnormal.	Contact the agent or Inovance.
		The rectifier bridge, pre-charge resistor, drive board, or control board are abnormal.	Contact the agent or Inovance.
Err10	AC drive overload	The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
		The AC drive power class is small.	Replace an AC drive of larger power class.
Err11	Motor overload	F9-01 (Motor overload protection gain) is set improperly.	Set F9-01 (Motor overload protection gain) correctly.
		The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
Err12	Input phase loss	Input phase loss occurs.	Eliminate faults in external circuits.
		The drive board, lightning protection board, main control board, or rectifier bridge is abnormal.	Contact the agent or Inovance.
Err13	Output phase loss	The motor is faulty.	Check and ensure that the motor is free of open circuit.
		The cable connecting the AC drive and the motor is abnormal.	Eliminate external faults.
		The AC drive's three-phase outputs are unbalanced when the motor is running.	Check whether the motor three-phase winding is normal.
		The drive board or the IGBT is abnormal.	Contact the agent or Inovance.
Err14	IGBT overheat	The ambient temperature is too high.	Lower the ambient temperature.
		The ventilation is clogged.	Clean the ventilation.
		The fan is damaged.	Replace the cooling fan.
		The thermistor of IGBT is damaged.	Replace the thermistor.
		The IGBT is damaged.	Replace the IGBT.

Fault Code	Fault Name	Possible Cause	Solution
Err15	External fault	An external fault signal is input using the DI.	Eliminate external faults, and confirm that the mechanical condition allows restart (F8-18) and reset the operation.
		An external fault signal is input using virtual I/O.	Confirm that the virtual I/O parameters in group A1 are set correctly and reset the operation.
Err16	Communication fault	The host controller is in abnormal state.	Check the cable of the host controller.
		The communication cable is abnormal.	Check the communication cables.
		The serial port communication protocol (F0-28) of the extension communication card is set improperly.	Set F0-28 (Serial port communication protocol) for the extension communication card correctly.
		Communication parameters in group Fd are set improperly.	Set communication parameters in group Fd properly.
		If the fault still exists after all the preceding checkings are done, restore the default settings.	
Err17	Contactor fault	The drive board and power supply are abnormal.	Replace the drive board or power supply board.
		The contactor is abnormal.	Replace the contactor.
		The lightning protection board is abnormal.	Replace the lightning protection board.
Err18	Current detection fault	The Hall element is abnormal.	Replace the Hall element.
		The drive board is abnormal.	Replace the drive board.
Err19	Motor auto-tuning fault	Motor parameters are not set according to the nameplate.	Set motor parameters correctly according to the nameplate.
		Motor auto-tuning times out.	Check whether the AC drive and motor are connected correctly.
		The encoder is abnormal.	Check whether F1-27 (Encoder pulses per revolution) is set correctly. Check whether signal lines of the encoder are connected correctly and securely.
Err20	Encoder fault	The encoder is not matched.	Set the encoder type correctly.
		The encoder wiring is incorrect.	Check the PG card power supply and phase sequence.
		The encoder is damaged.	Replace the encoder.
		The PG card is abnormal.	Replace the PG card.
Err21	EEPROM read-write fault	The EEPROM chip is damaged.	Replace the main control board.
Err23	Short circuit to ground	The motor is short-circuited to the ground.	Replace the cable or motor.

Fault Code	Fault Name	Possible Cause	Solution
Err26	Accumulative running time reached	The accumulative running time reached the set value.	Clear the record by parameter initialization.
Err27	User-defined fault 1	The signal of user-defined fault 1 is input through the multi-functional terminal DI.	Perform the reset operation.
		The signal of user-defined fault 1 is input through the virtual I/O.	Perform the reset operation.
Err28	User-defined fault 2	The signal of user-defined fault 2 is input through the multi-functional terminal DI.	Perform the reset operation.
		The signal of user-defined fault 2 is input through the virtual I/O.	Perform the reset operation.
Err29	Accumulative power-on time reached	The accumulative power-on time reached the set value.	Clear the record by parameter initialization.
Err30	Load loss	The operation current of the AC drive is smaller than F9-64 (Load loss detection level).	Check whether the load is disconnected or ensure that F9-64 (Load loss detection level) and F9-65 (Load loss detection time) are set based on the actual conditions.
Err31	PID Feedback loss	PID feedback is smaller than FA-26 (Detection level of PID feedback loss).	Check the PID feedback signal or set FA-26 (Detection level of PID feedback loss) correctly.
Err40	Pulse-by-pulse current limit fault	The load is too heavy or locked-rotor occurs on the motor.	Reduce the load or check motor and mechanical conditions.
		The AC drive power class is small.	Replace an AC drive of larger power class.
Err41	Motor switchover fault during running	Motor switchover is performed using a terminal during running of the AC drive.	Perform motor switchover after the AC drive stops.
Err42	Speed error	Encoder parameters are set improperly.	Set encoder parameters properly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		F9-69 (Detection level of speed error) and F9-70 (Detection time of speed error) are set incorrectly.	Set F9-69 (Detection level of speed error) and F9-70 (Detection time of speed error) correctly based on actual condition.

Fault Code	Fault Name	Possible Cause	Solution
Err43	Motor overspeed	Encoder parameters are set improperly.	Set encoder parameters properly.
		Motor auto-tuning is not performed.	Perform motor auto-tuning.
		F9-67 (Overspeed detection level) and F9-68 (Overspeed detection time) are set incorrectly.	Set F9-67 (Overspeed detection level) and F9-68 (Overspeed detection time) correctly based on the actual situation.
Err45	Motor overheat	Cable connection of the temperature sensor becomes loose.	Check cable connection of the temperature sensor.
		The motor temperature is too high.	Increase the carrier frequency or take other measures to cool the motor.
Err61	Braking unit overload	The resistance of braking resistor is too small.	Use a braking resistor of larger resistance.
Err62	Short-circuit of braking circuit	The braking module is abnormal.	Contact the agent or Inovance.

6.2 Common Symptoms and Solutions

No.	Fault Symptom	Possible Cause	Solution
1	There is no display upon power-on.	There is no power supply to the AC drive or the power input to the AC drive is too low.	Check the power supply.
		The switching power supply on the drive board of the AC drive is faulty.	Check the bus voltage.
		Wires between the control board and drive board and between the control board and operating panel break.	Re-connect the 8-pin wire and 40-pin wire.
		The pre-charge resistor of the AC drive is damaged.	Contact the agent or Inovance.
		The control board or the operating panel is faulty.	
		The rectifier bridge is damaged.	

No.	Fault Symptom	Possible Cause	Solution
2	"HC" is displayed upon power-on.	Cable connection between the drive board and control board is in poor contact.	Re-connect the 8-pin wire and 28-pin wire.
		Related components on the control board are damaged.	Contact the agent or Inovance.
		The motor or motor cable is short-circuited to ground.	
		The Hall element is faulty.	
		The mains voltage is too low.	
3	"Err23" is displayed upon power-on.	The motor or the motor cable is short-circuited to the ground.	Check the insulation status of the motor and the output cable with a megger.
		The AC drive is damaged.	Contact the agent or Inovance.
4	The AC drive display is normal upon power-on, but after running the AC drive displays "HC" and stops immediately.	The cooling fan is damaged or does not rotate.	Replace the damaged fan.
		The cable of the external control terminal is short-circuited.	Eliminate the external short-circuit fault.
5	"Err14" (IGBT overheat) is detected frequently.	The setting of carrier frequency is too high.	Reduce F0-15 (Carrier frequency).
		The cooling fan is damaged, or the ventilation is clogged.	Replace the cooling fan and clean the ventilation.
		Components (thermal coupler or others) inside the AC drive are damaged.	Contact the agent or Inovance.
6	The motor does not rotate after the AC drive runs.	Check the motor and the motor cables.	Check that cabling between the AC drive and the motor is normal.
		The motor parameters in group F1 are set improperly.	Restore the factory parameters and reset the following parameters properly: <ul style="list-style-type: none"> ◆ Encoder parameters ◆ Motor ratings, such as rated motor frequency and rated motor speed ◆ F0-01 (Motor 1 control mode) and F0-02 (Running command selection) ◆ F3-01 (Torque boost) in V/F control under heavy-load start
		Cable connection between the drive board and control board is in poor contact.	Re-connect wirings and ensure secure connection.
		The drive board is faulty.	Contact the agent or Inovance.

No.	Fault Symptom	Possible Cause	Solution
7	DI terminals are disabled.	The related parameters are set incorrectly.	Check and reset the parameters in group F4 again.
		The external signal is incorrect.	Re-connect the external signal cable.
		The jumper across OP and +24 V becomes loose.	Re-confirm the jumper bar across OP and +24 V.
		The control board is faulty.	Contact the agent or Inovance.
8	The motor speed does not rise in FVC control.	The encoder is faulty.	Replace the encoder and re-confirm cable connection.
		The encoder connection is incorrect or in poor contact.	Replace the PG card.
		The PG card is faulty.	Contact the agent or Inovance.
		The drive board is faulty.	
9	The AC drive detects overcurrent and overvoltage frequently.	The motor parameters in group F1 are set improperly.	Set the motor parameters in group F1 or perform motor auto-tuning again.
		The acceleration/deceleration time is improper.	Set proper acceleration/deceleration time.
		The load fluctuates.	Contact the agent or Inovance.
10	"Err17" is detected upon power-on or running.	The pre-charge contactor is not closed.	<ul style="list-style-type: none"> ◆ Check whether the contactor cable is loose. ◆ Check whether the contactor is faulty. ◆ Check whether 24 V power supply of the contactor is faulty. ◆ Contact the agent or Inovance.
11	The brake torque of the motor is insufficient when the motor is in the deceleration or decelerate to stop state.	The encoder disconnection or overvoltage stall protection takes effect.	<p>Check the encoder wiring at FVC (F0-01 = 1).</p> <p>If the braking resistor has been configured, set F3-23 (Voltage limit selection) to 0 (Disabled).</p>