

9 Faults and solutions *otomasyon AVM*

9.1 Meanings of the fault alarm code and countermeasures

Code	Name	Causes	Countermeasures
Er01-0	IGBT fault	The actual output current exceeds the specified value 1. Drive fault (drive circuit, IGBT fault); 2. Short circuit of motor cable U, V, W, or the motor cable is grounded or connected improperly; 3. Motor burn down; 4. Reverse sequence of U, V, W phase; 5. Parameters are inappropriate and cause system divergence. 6. ACC/DEC of start/stop process is too short; 7. Instantaneous load is too large.	1. Remove the motor cables and enable the drive, if the fault persists, replace the drive; 2. Check the motor cables and wiring 3. Reduce the value of P0.10 and P0.11; 4. Commission the loop parameters to stabilize the system and reduce the value of P0.12; 5. Increase the ACC/DEC time; 6. Replace with the drive with larger power; 7. Replace the motor.
Er01-1	Brake tube fault (7.5kW and above models)	Brake unit fault	Replace the drive
Er02-0	Encoder fault– The encoder cable broken	1. The encoder is not connected; 2. The encoder connector becomes loose; 3. One of U, V, W, A, B Z phase cables is broken; 4. Reversed A/B phase of the encoder; 5. Communication break or abnormal data caused by noise; 6. Normal encoder communication but abnormal communication data; 7. FPGA communication overtime 8. The drive does not support the encoder type.	1. Check the encoder connector or replace the encoder cable if the cable is disconnected; 2. Detect whether encoder power voltage is normal; 3. Reduce the interference of the encoder, route the encoder and motor independently and connect the shielded cables of the encoder to FG; 4. If reporting encoder disconnection fault when power on, check whether the available drive encoder type is consistent with the available motor encoder type according to P0.01.
Er02-1	Encoder fault–Encoder feedback error is too large		
Er02-2	Encoder fault– Parity error		
Er02-3	Encoder fault–CRC check error		
Er02-4	Encoder fault–Frame error		
Er02-5	Encoder fault–Short frame error		
Er02-6	Encoder fault– Encoder overtime		
Er02-7	Encoder fault –FPGA overtime		

Code	Name	Causes	Countermeasures
Er02-8	Encoder fault –Low voltage alarm of the encoder	If multi-turn encoder is used, the battery voltage of the external encoder is between 3.0V–3.2V	1. Check the battery connection in encoder cable; 2. Check whether the external battery voltage of encoder is below 3.2V, if yes, change the battery; 3. Change the battery when the drive is power on; otherwise the encoder data will be lost.
Er02-9	Encoder fault –Undervoltage alarm of the encoder battery	If multi-turn encoder is used, the battery voltage of the external encoder is between 2.5V–3.0V.	1. Check the battery connection in the encoder cable; 2. Check whether the voltage is below 3.0V, if yes, change the battery; 3. Change the battery when the drive is power on; otherwise the encoder data will be lost.
Er02-a	Encoder fault –Encoder over-temperature	The feedback encoder temperature is higher than the set over-temperature value	1. Check the setting value of the over-temperature protection value; 2. Stop the motor and reduce the encoder temperature.
Er02-b	Encoder fault–EEPROM write-in error	If the motor is used with communication encoder, and when the drive updates the data to encoder EEPROM, there is communication transmission error or data check error.	1.Check the encoder connection and reduce the interference to encoder communication; 2.Write in for several times or change the motor.
Er02-c	Encoder fault–EEPROM no data	If the motor is used with communication encoder, and when read encoder EEPROM during power on, there is no data.	1.Select the current motor model through P0.00 and then carry out the encoder EEPROM writing through P4.97; 2.Block the fault by P4.98, and then carry out corresponding initialization with the motor parameters in EEPROM.
Er02-d	Encoder fault–EEPROM data check error	If the motor is used with communication encoder, and when read encoder EEPROM during power on, there is data check error.	1.Check the encoder connection and reduce the encoder interference; 2. Select the current motor model through P0.00 and then carry out the encoder EEPROM writing through P4.97;

Code	Name	Causes	Countermeasures
			3. Shield the fault by P4.98, and then carry out corresponding initialization to the motor parameters.
Er03-0	Current sensor fault—U phase current sensor fault	1. Current sensor or abnormal detection circuit; 2. Power on when the motor shaft is in a state of non-stationary.	Repower on when the motor is in static state or change the drive
Er03-1	Current sensor fault—V phase current sensor fault		
Er03-2	Current sensor fault—W phase current sensor fault		
Er04-0	System initialization fault	The self-inspection is not passed after initialization.	1. Repower on; 2. If the fault occurs for several times, change the drive.
Er05-1	Setting fault— Motor model does not exist	Wrong P0.00 setting	1. Ensure the motor model is set correctly; 2. Ensure the motor parameter model matches with the power class of the drive.
Er05-2	Setting fault—Motor and drive model does not match		
Er05-3	Setting fault— Software limit setting error	Software limit values setting is improper. The setting value of P0.35 is less than or equal to the setting value of P0.36.	Reset P0.35 and P0.36.
Er05-4	Setting fault—return to homing mode setting fault	Mode of P5.10 is set incorrectly.	Set P5.10 according to the instructions.
Er05-5	Setting fault— Point control travel overflow fault	The signal increment of idle travel of the bit exceeds $2^{31}-1$.	The single travel cannot exceed $2^{31}-1$ in the absolute position mode
Er07-0	Regeneration of discharge overload fault	1. The power of the built-in braking resistor is relatively low; 2. The motor speed is too high or the deceleration is too fast; 3. The action limit of the external braking resistor is restricted to 10% of the duty ratio.	1. Replace with an external braking resistor and increase the power; 2. Modify the deceleration time and reduce regeneration discharge action rate; 3. Reduce the motor speed; 4. Improve the capacity of the motor and drive.

Code	Name	Causes	Countermeasures
Er08-0	Analog input overvoltage fault— Analog input 1	The voltage inputted to analog input 1 port exceeds the setting value of P3.22.	1. Set P3.22, P3.25, P3.75 correctly; 2. Check the terminals wiring; 3.Set P3.22, P3.25, P3.75 to 0 to disable the protection function.
Er08-1	Analog input overvoltage fault— Analog input 2	The voltage inputted to analog input 2 port exceeds the setting value of P3.25	
Er08-2	Analog input overvoltage fault— Analog input 3	The voltage inputted to analog input 3 port exceeds the setting value of P3.75	
Er09-0	EEPROM fault— Read-write fault	1. The data stored in data storage area is damaged when reading data from EEPROM 2. There is interference to EEPROM write operation	1.Try again after repower on; 2. If the problem reoccurs for many times, change the drive.
Er09-1	EEPROM fault— data check fault	1. The data read from EEPROM when power on is different from that during writing; 2. The drive DSP software version updates.	1. Reset all parameters; 2. If the problem reoccurs for many times, change the drive.
Er10-0	Hardware fault— FPGA fault	FPGA chip fault	1. Repower on; 2. If the problem reoccurs for many times, change the drive.
Er10-1	Hardware fault— Communication card fault	External communication card fault	1. Repower on 2. If the problem reoccurs for many times, change the communication card
Er10-2	Hardware fault— Ground short circuit fault	During the earth test after power on, one of motor cables V, W is short-circuited to the ground	1. Check the connection of the motor cables; 2. Change the motor cable or test whether the motor insulation aging or not.
Er10-3	Hardware fault— External input fault	This fault occurs when the digital terminal configured as external fault input function acts.	1. Clear the external fault input and enable fault clearance; 2. Repower on the drive
Er10-4	Hardware fault—Emergency stop fault	This fault occurs when the digital terminal configured as emergency stop button acts.	1. Clear the emergency stop input and enable fault clearance; 2. Repower on the drive
Er10-5	Hardware fault— 485 communication fault	Strong EMI of 485 communication circuit causes drive serial communication alarms	1. Use twisted shielded pairs for 485 communication; 2.Wiring communication cables and

Code	Name	Causes	Countermeasures
			motor power cables separately.
Er11-0	Software fault– Reentry of motor control mission	1. CPU loading ratio is too high 2.DSP software fault	1. Reduce the software function; 2. Contact the customer service and change the DSP software.
Er11-1	Software fault– Reentry of cycle mission		
Er11-2	Software fault - Illegal operation		
Er12-0	IO fault– Digital input distribution repeated	Two or more digital inputs are configured to the same functions	Reset P3.00–P3.09 and ensure there is no repeated setting.
Er12-1	IO fault–Analog input distribution repeated	If the drive is standard, the analog input 3 is speed command	Set P3.70 to other value.
Er12-2	IO fault–Pulse input frequency is too high	The pulse input frequency detected by the drive is higher than the designated value 1. External input pulse signal frequency is too high. 2. Damage of internal drive pulse frequency detection circuit	1. Reduce the external input pulse signal frequency; 2. Change the drive if fault occur when external input signal is normal.
Er13-0	Main circuit overvoltage fault	The DC voltage of the main circuit is higher than the designated value 1. The grid voltage is too high; 2. No braking resistor or pipe during braking or the braking resistor is damaged; 3.DEC time is too short during the stopping; 4. The internal DC voltage test circuit is damaged	1. Check whether the grid input voltage exceeds the allowed value; 2. Check whether the internal braking resistor is loose or damaged; check whether external braking resistor is damaged; 3.Enlarge the setting value of ACC/DEC time; 4. Monitor R0.07 when the drive is disabled, if it is abnormal and does not match with grid input voltage, change the drive.
Er13-1	Main circuit undervoltage fault	The DC voltage of the main circuit is less than the designated value 1. The grid voltage is too low; 2.The buffer relay is not switched on; 3. The drive output power is too large; 4. The internal DC voltage test circuit is damaged	1. Check whether the grid input voltage is lower than the allowed value; 2. Repower on, and check whether there is pull-in noise of the relay; 3. Monitor R0.07 when the drive is disabled, if it is abnormal and does not match with grid input voltage, change the drive.

Code	Name	Causes	Countermeasures
Er14-0	Control circuit undervoltage fault	The DC voltage of the control power is less than the designated value 1. The grid voltage is too low; 2. The internal control power DC voltage test circuit is damaged.	1. Check whether the grid input voltage is lower than the allowed value; 2. Monitor R0.08 when the drive is disabled, If it is abnormal and does not match with grid input voltage, change the drive.
Er17-0	Drive overload fault	Short-time load of the drive is too heavy	1.The load is too heavy which causes drive overload; 2.Check whether phase dislocation or phase loss occurred to UVW wiring of the motor, and check whether encoder is correct; 3.Check whether the motor is compatible with the drive.
Er18-0	Motor overload fault	1. Long-term overload running; 2. The load is too heavy during short time.	1. Replace with the drive and motor with larger power.
Er18-1	Motor overtemperature fault	Motor temperature exceeds the protection value	Replace with the motor of larger power;
Er19-0	Speed fault– Overspeed fault	The absolute value of the motor speed exceeds the setting value of P4.32 1. U, V, W phases of the motor are connected reversely; 2. Incorrect setting of the electronic gear ratio or motor speed loop control parameters; 3.The setting value of P4.32 is less than the setting value of P4.31 (max. speed limit); 4. Interference to the encoder feedback signal.	1. Check the electronic gear ratio; 2. Check the setting of speed loop control parameters; 3. Check that the phase sequence of the motor cable are connected correctly; 4. Check whether motor encoder connection is proper; 5. Replace with the motor with higher rotation speed.
Er19-1	Speed fault-FWD overspeed fault	Speed feedback exceeds the value of P4.40 by more than 20ms.	1.Check whether encoder is normal; 2.Check whether P4.40 parameter is set properly.
Er19-2	Speed fault-REV overspeed fault	Speed feedback exceeds the value of P4.41 by more than 20ms.	1.Check whether encoder is normal; 2.Check whether P4.41 is set properly.

Code	Name	Causes	Countermeasures
Er19-3	Speed fault-Overspeed parameter setup is wrong	The value of P4.40 is less than 0 or P4.41 is larger than 0.	1.Check whether encoder is connected reliably; 2.Check whether P4.40 and P4.41 are set improperly.
Er20-0	Speed deviation fault	In non-torque mode, the deviation between motor speed and speed command exceeds the set value of P4.39 1. U, V, W phases of the motor are connected reversely or motor cable is not connected. 2. The motor load is so heavy that it causes motor stall 3. Insufficient drive force that causes motor stall 4. Speed loop control parameters setting is improper 5. The set value of P4.39 is too small.	1. Check the phase sequence of motor cable and ensure right wiring; 2. Check whether the conveyer belt or chain or the workbench reaches the boundary or encounters obstacles; 3. Check whether the loop control parameters are set correctly or the drive is damaged or servo system model is proper; 4. Enlarge the setting value of P4.39 5. Set P4.39 to 0 to disable speed deviation fault detection.
Er21-0	Position overtravel-FWD overtravel	Under position mode, the FWD limit switch is touched or the accumulated feedback pulse exceeds P0.35.	1.Check whether FWD limit switch signal is correct; 2.Check whether P0.35 is set properly.
Er21-1	Position overtravel-REV overtravel	Under position mode, the FWD limit switch is touched or the accumulated feedback pulse exceeds P0.36.	1.Check whether REV limit switch signal is correct; 2.Check whether P0.36 is set properly.
Er22-0	Hybrid control deviation is too large	1. Server response time is too slow, causing retention pulse number to exceed the setting value of P4.33; 2. The motor load is too heavy to cause motor stall; 3.The pulse input frequency is too high and exceeds the max. speed of motor; 4. Position command input step change exceeds the setting value of P4.33.	1. Check whether the conveyer belt or chain or the workbench reaches the boundary or encounters obstacles; 2. Enlarge the position loop gain parameters or speed feedforward gain or P4.33; 3. Adjust the electronic gear ratio parameter; 4. Decrease the variation of position command input.

Code	Name	Causes	Countermeasures
Er22-1	Position increment overflow fault	In fully-closed loop control, the deviation between the feedback position of linear encoder and that of the encoder exceeds the setting value of P4.64	1.Check the connection between the motor and load; 2. Check the connection between linear encoder and the drive; 3.Check the setting of P4.60, P4.61 and P4.62.
Er22-2	Position increment overflow fault	The position command of single variation after converting via electronic gear ratio exceeds ($2^{31}-1$).	1. Decrease the single variation quantity of position command; 2. Modify the gear ratio to a proper range.
Er23-0	Drive over-temperature fault	1.The ambient temperature of the drive exceeds the designated value; 2. Drive overload.	1.Reduce the ambient temperature and improve the ventilation environment; 2. Replace with a servo system with larger power; 3. Prolong the ACC/DEC time and reduce the load.
Er25-4	Application fault–Encoder offset angle test failed	Abnornity occurred during encoder offset angle test.	Check whether the motor shaft can rotate freely, then repower on and carry out.
Er25-5	Application fault–Encoder offset angle test failed	The current feedback wave fluctuate violently during encoder offset angle test	Reduce P4.53 parameter setting, then repower on and carry out.
Er25-6	Application fault–Offside of homing	Encounter the limit switch or software limit during homing	Modify the setting of P5.10, repower on and carry out.
Er25-7	Application fault–Inertia identification failed	1.Vibration in stopping exceeds 3.5s; 2. Too short ACC time; 3. The identification speed is below 150r/min.	1.Improve the mechanical rigidity properly; 2.Increase P1.07; 3.Increase P1.06.

9.2 CANopen communication fault code and countermeasures

Code	Name	Causes	Countermeasures
Er22-3	Sync signal overtime	Under interpolation position mode, the time interval between the two neighboring sync frame signals exceeds twice of the communication time cycle.	1.Check communication cable to improve communication reliability; 2.Check whether the generation interval of sync frame of sync signal generation source is correct.

Code	Name	Causes	Countermeasures
Er22-4	Position command buffer is full	CANopen PTP position command buffer is full.	Prolong the time interval of PTP position command transmission
Er26-0	CANOpen disconnection	The master does not receive the heartbeat message from the slave during a period of time	Check the communication wiring.
Er26-1	SDO index does not exist	SDO read or write parameters, the corresponding index does not exist or is not supported	Check the index and modify EDS file
Er26-2	SDO sub index does not exist	SDO read or write parameters, the corresponding sub index does not exist or is not supported	Check the index and modify EDS file
Er26-3	SDO data length error	The length of SDO read or write command does not match with the data length in drive object dictionary.	Adjust the length of SDO R/W command according to the data length of drive object dictionary
Er26-4	SDO write data exceeds the range	The range of SDO write command exceeds the data range of drive object dictionary	Adjust written data of SDO according to the data range in object dictionary.
Er26-5	Read-only and non-modifiable	Modify the read-only parameters	Check whether the parameter to be written is read-only data.
Er26-6	PDO mapping length error	The mapping length of PDO data exceed 64 bit	Check the mapping length of PDO
Er26-7	PDO mapping data does not exist	PDO mapping data cannot be found in the object dictionary	Check PDO mapping data in the object dictionary
Er26-8	PDO not allowed to be changed in the operating	Modify the PDO mapping during operation	Switch CANOpen state to pre-workbench and then modify PDO mapping
Er26-9	PDO not allow the mapping	Map the parameters not allowed into PDO	Check whether there are read-only PDO parameters being mapped into RPDO.
Er26-a	Sync signal is too fast	The received frame exceeds the range allowed by baud rate	1.Modify the interval of data frame transmission via master station or the interval of synchronization frame; 2.Modify communication baud rate.
Er26-b	Receiving fault	CAN communication offline or the received error exceed 128	1.Check communication wiring; 2.Restart the servo drive.
Er26-c	Transmission fault	CAN communication offline or received error exceed 128	1.Check communication wiring; 2.Restart the servo drive.

Code	Name	Causes	Countermeasures
Er26-d	Sync signal repeat	Receive the synchronization signal of external input when synchronization signal is from slave station	Modify the configuration and ensure only there is only one synchronization signal generation source in one communication network.
Er26-e	Bus load rate is too high	In asynchronous work mode, the number of frames received by the slave exceeds the scope allowed by baud rate	1. Modify the interval of data frame transmission via master station; 2. Modify the transmission mode of slave station TPDO; 3. Modify communication baud rate.
Er26-f	Parameter modification state error	Modify the parameter in the state not allowed	Adjust the CANopen machine to Pre-OP or OP state, and then try to modify the parameters

9.3 PROFIBUS-DP communication fault code and countermeasures

Code	Name	Causes	Countermeasures
Er24-0	PWK ID error	PWK ID error	Read the manual , ensure the ID of PWK corresponds to the parameter ID
Er24-1	PWK exceed the range	The setting of PWK exceed the range allowed by the corresponding parameter	Read the manual , ensure the PWK setting of PWK is in the range allowed by the corresponding parameter
Er24-2	Read-only PWK parameter	PWK parameter performs write operation to read-only parameters.	Read the manual , ensure the parameter can be read and written
Er24-3	PZD configuration parameter does not exist	The selected ID is not right	Read the manual , ensure the ID corresponds to the corresponding parameter ID
Er24-4	PZD configuration parameter does not matching	The parameter is not valid instantly	Read the manual , ensure the parameter is valid instantly

9.4 EtherCAT communication fault code and countermeasures

Code	Name	Cause	Countermeasures
Er24-8	Initialization fault	Poor contact of EtherCAT chip	Replace the servo
Er24-9	EEPROM fault	EtherCAT EEPROM has no data or data reading failed.	Use TwinCAT tool to download xml file to EtherCAT EEPROM;

Code	Name	Cause	Countermeasures
Er24-a	DC Sync0 signal abnormal	DC Sync0 interruption signal is not detected during a period of time under DC sync working mode.	Check whether interruption causes data loss; Check whether EtherCAT master can work normally;
Er24-b	Disconnection fault	After the drive is enabled, the network cable is detected to be inserted improperly or EtherCAT master is running improperly.	Check whether network cable is connected properly, the connection mode of network cable is top-in and bottom-out; Check interferences; Check whether EtherCAT master can work properly.
Er24-c	PDO data loss fault	No PDO data is received after the drive is enabled for a period of time.	Check whether EtherCAT master works properly; Check whether interference causes data loss.

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