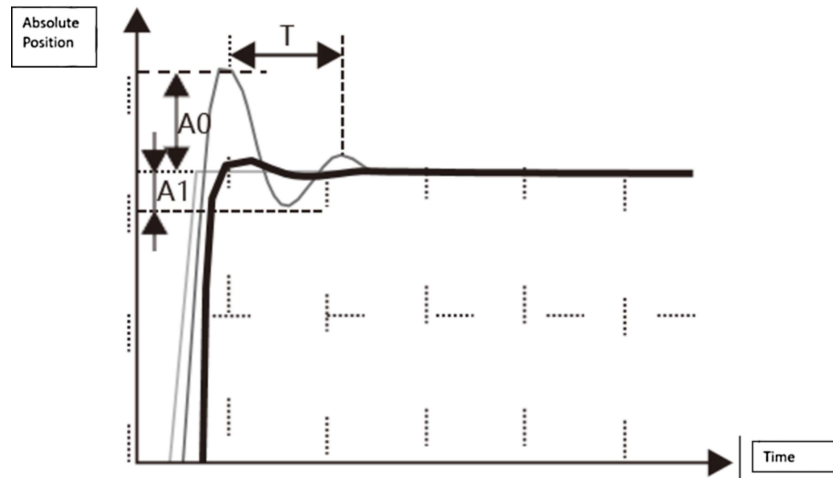




Related parameters:

Parameter		Description	Range	Smallest unit	Factory setting
P02	20	1 st damping frequency	10.0HZ~100.0HZ	0.1Hz	0.0Hz
P02	21	1 st damping filter setting	0~1.0	0.1	0
P02	22	2nd ^d damping frequency	10.0HZ~100.0HZ	0.1Hz	0.0Hz
P02	23	2nd damping filter setting	0~1.0	0.1	0

9. Fault protections and alarms

9.1 List of errors and alarms

Code	Description	Stop mode	Reset (Y/N)	Record memory
Err.001	System parameter abnormal	Stop immediately	N	No memory
Err.002	Product model selection fault	Stop immediately	N	No memory
Err.003	Fault during parameter storage	Stop immediately	N	No memory
Err.004	FPGA fault	Stop immediately	N	No memory

Err.005	Product matching fault	Stop immediately	N	No memory
Err.006	Program abnormal	Stop immediately	N	No memory
Err.007	Encoder initialization abnormal	Stop immediately	N	Memory
Err.008	Short circuit to ground detection fault	Stop immediately	N	Memory
Err.009	Overcurrent fault A	Stop immediately	N	Memory
Err.010	Overcurrent fault B	Stop immediately	Y	Memory
Err.012	Incremental encoder Z breakage or absolute encoder number of turns abnormal	Stop immediately	Y	Memory
Err.013	Encoder communication abnormal	Configurable	Y	Memory
Err.014	Encoder data abnormal	Configurable	Y	Memory
Err.015	Encoder battery undervoltage	Stop immediately	N	Memory
Err.016	Speed deviation too large	Configurable	Y	Memory
Err.017	Torque saturation overtime	Configurable	Y	Memory
Err.018	Control power undervoltage	Configurable	Y	Memory
Err.019	Tripping error	Configurable	Y	Memory
Err.020	Overvoltage	Stop immediately	Y	Memory
Err.021	Undervoltage	Decelerate to stop	Y	Configurable
Err.022	Current sampling fault	Stop immediately	Y	Memory
Err.023	AI sampling voltage too large	Stop immediately	Y	Memory
Err.024	Overspeed	Stop immediately	Y	Memory
Err.025	Electrical angle identification failure	Stop immediately	Y	No memory
Err.026	Load identification failure	Stop immediately	Y	No memory
Err.027	DI parameter setting fault	Stop immediately	Y	No memory
Err.028	DO parameter setting fault	Stop immediately	Y	No memory
Err.040	S-ON instruction invalid fault	Configurable	Y	No memory
Err.042	Pulse division output overspeed	Configurable	Y	Memory
Err.043	Position deviation too large	Configurable	Y	Memory
Err.044	Main circuit input phase loss	Configurable	Y	Memory
Err.045	Drive output phase loss	Configurable	Y	Memory
Err.046	Drive overload	Configurable	Y	Memory
Err.047	Motor overload	Configurable	Y	Memory
Err.048	Electronic gear setting fault	Configurable	Y	No memory
Err.049	Heat sink too hot	Configurable	Y	Memory
Err.050	Pulse input abnormal	Configurable	Y	Memory
Err.051	Full-closed loop position deviation too large	Configurable	Y	Memory
Err.054	User forced fault	Decelerate to stop	Y	Memory
Err.055	Absolute position resetting fault	Configurable	Y	Memory
Err.056	Main circuit outage	Decelerate to stop	Y	Memory
Err.060	First start after writing customized software	Stop immediately	N	Configurable
Err.065	CAN bus off	Configurable	Y	Memory
Err.066	Abnormal NMT instruction	Configurable	Y	Memory
Err.067	CAN bus failure	Decelerate to stop	Y	Memory

Err. 068	External overspeed(reserved)	Stop immediately	Y	Memory
Err. 069	Hybrid deviation too large	Configurable	Y	Memory
Err. 071	Node protection or heartbeat timeout	Configurable	Y	Memory
Err. 072	Synchronization failure	Configurable	Y	Memory
Err. 073	CANOpen track buffer underflow	Configurable	Y	Memory
Err. 074	CANOpen track buffer overflow	Configurable	Y	Memory
AL.080	Undervoltage warning	No stop	Y	No memory
AL.081	Drive overload warning	No stop	Y	Memory
AL.082	Motor overload warning	No stop	Y	Memory
AL.083	Parameter modification needs power restart	No stop	Y	No memory
AL.084	Servo not ready	No stop	Y	No memory
AL.085	EEPROM frequency writing warning	No stop	Y	No memory
AL.086	Positive over-travel warning	No stop	Y	No memory
AL.087	Negative over-travel warning	No stop	Y	No memory
AL.088	Positive instruction overspeed	No stop	Y	No memory
AL.090	Absolute encoder angle initialization warning	No stop	Y	Memory
AL.093	Regenerative overload	No stop	Y	Memory
AL.094	Regenerative resistor too small	No stop	Y	No memory
AL.095	Emergency stop	Decelerate to stop	Y	No memory
AL.096	Homing error	Decelerate to stop	Y	No memory
AL.097	Encoder battery undervoltage	No stop	Y	No memory

9.2 Troubleshooting

Code	Description	Causes	Troubleshooting measures
Err.001	System parameter abnormal	1. Control circuit power suddenly drops; 2. After updating servo software, some previously saved parameters exceed settings range.	1. Make sure input power is within specified range; 2. Set P20.06=1 to initialized system parameters.
Err.002	Product model selection fault	1. Encoder cable connection broken or loose; 2. Invalid drive or motor model.	1. Check and fasten encoder cable; 2. Replace with valid drive or motor model.
Err.003	Fault during parameter storage	1. Parameter reading/writing too frequent; 2. Parameter storage component fault; 3. Control circuit power unstable; 4. Drive fault.	1. Check if upper controller is reading/writing E2PROM too frequent; 2. Check control circuit power cable and ensure control circuit power voltage is within specified range.
Err.004	FPGA fault	Software version fault.	Check if software version is correct.
Err.005	Product matching fault	1. Encoder cable connection broken or loose; 2. Use third-party encoder which is not supported;	1. Check and fasten encoder cable; 2. Replace products that don't match; 3. Choose correct encoder type or replace the drive.

		3. Motor capacity and drive capacity don't match. Motor capacity class is larger than or two levels off the drive; 4. Product model code doesn't exist.	
Err.006	Software abnormal	1. System parameter abnormal; 2. Drive internal fault.	Set P20.06=1 to initialized system parameters and restart power.
Err.007	Encoder initialization abnormal	Encoder signal abnormal at power on.	Check or replace encoder cable.
Err.008	Short circuit to ground detection fault	1. UVW wiring fault; 2. Motor breakdown; 3. Drive fault.	1. Check if UVW is short circuited to ground. If so replace cable; 2. Check if motor cable or grounding resistance is abnormal. If so replace the motor.
Err.009	Overcurrent fault 1	1. Instruction input is too fast; 2. Regenerative resistor too small or short circuited; 3. Motor cable bad contact; 4. Motor cable grounding; 5. Motor UVW short circuited; 6. Motor burnt; 7. Software detected power transistor overcurrent	1. Check instruction input time sequence and input after S-RDY; 2. Replace regenerative resistor; 3. Check and fasten encoder cable; 4. Replace motor if UVW insulation resistor is broken; 5. Check if UVW is short circuited; 6. Replace motor if UVW don't have equal resistance; 7. Reduce load, use bigger drive and motor, increase acceleration/deceleration time.
Err.010	Overcurrent fault 2	Same as Err.009	Same as Err.009
Err.012	Incremental encoder Z breakage or absolute encoder number of turns abnormal	Incremental encoder: Z-phase signal loss due to cable breakage or encoder fault; Absolute encoder: battery shortage, encoder cable plugging & unplugging during power off, or after P06.47=1 not initialize the encoder.	1. Rotate motor shaft manually, if error still occurs, replace cable or encoder; 2. Replace battery if undervoltage; 3. P20.06=7 and initialize.
Err.013	Encoder communication abnormal	1. Communicational encoder cable breakage; 2. Encoder not grounded; 3. Communication verification abnormal.	1. Check or replace encoder cable; 2. Check if encoder is grounded properly.
Err.014	Encoder data abnormal	1. Serial encoder breakage or bad contact; 2. Serial encoder data reading/writing abnormal	Check or replace encoder cable.
Err.015	Encoder battery undervoltage	Encoder battery voltage is less than P06.48 and ten's place of P06.47 is 1.	Replace encoder battery.

Err.016	Speed deviation too large	Speed instruction and speed feedback deviation exceeds settings of P06.45.	1. Increase P06.45 value; 2. Increase acceleration/deceleration time or increase system responsiveness; 3. Set P06.45=0 to disable speed deviation too large function.
Err.017	Torque saturation overtime	Torque maintains saturated for time longer than settings of P06.46.	1. Increase P06.46 value; 2. Check if UVW is broken.
Err.018	Control power undervoltage	Poor input wiring or input power failure	1. Check input power and wiring 2. Replace driver
Err.019	Tripping error	Motor stall due to incorrect wiring	1. Check UVW and encoder wiring 2. Check drive and motor
Err.020	Overvoltage	1. Input power voltage exceeds 280VAC; 2. Regenerative resistor breakage or not matching; 3. Load inertia exceeds allowable range; 4. Drive broken.	1. Check input power voltage; 2. Check or replace regenerative resistor; 3. Increase acceleration/deceleration time or replace more suitable drive/motor.
Err.021	Undervoltage	1. Input power voltage drops; 2. Instantaneous power off; 3. P06.36 setting is too high; 4. Drive broken	1. Make sure input power is stable; 2. Reduce P06.36 value if input power is normal. (Memory is configurable by P07.19)
Err.022	Current sampling fault	Drive internal current sampling fault.	Replace servo drive.
Err.023	AI sampling voltage too large	1. AI wrong wiring; 2. AI external input power voltage too high	Do correct AI wiring and set input power voltage within $\pm 10V$.
Err.024	Overspeed	1. Speed instruction exceeds maximum speed setting value; 2. Wrong UVW phase sequence; 3. Speed response over modulation; 4. Drive faulty	1. Lower speed instruction 2. Check if UVW phase sequence is correct; 3. Adjust speed loop gains to reduce over shoot; 4. Replace drive
Err.025	Electrical angle identification failure	1. Load or inertia too large; 2. Wrong encoder cable wiring	1. Reduce load or increase current loop gains 2. Replace encoder cable.
Err.026	Load identification failure	1. Load or inertia too large. Motor cannot run at specified curves; 2. Verification process aborted by other faults.	1. Reduce load or increase current loop gains 2. Make sure verification process correct.
Err.027	DI parameter setting fault	1. Different DOs are assigned with same function; 2. Physical DI and communicational DI	Reassign DI functions

		have definition conflicts	
Err.028	DO parameter setting fault	Different DOs are assigned with same function	Reassign DO functions
Err.040	S-ON instruction invalid fault	Input S-ON signal after motor is energized by other auxiliary functions	
Err.042	Pulse division output overspeed	Pulse division output is over upper limit.	Adjust pulse division output settings.
Err.043	Position deviation too large	1. Servo motor UVW wiring is wrong; 2. Servo drive gain settings are too low; 3. Position instruction pulse frequency is too high; 4. Position instruction acceleration is too large; 5. P00.19 setting is too low; 6. Servo drive/motor faulty; 7. Brake release abnormal. Motor is locked by external forces, gravity etc.	1. Reconnect the cables 2. Increase servo gains 3. Reduce instruction frequency, acceleration or adjust gear ratio 4. Set up smoothing parameters; 5. Adjust the value of P00.19 6. Replace the drive 7. Check brake power and servo motor is not blocked.
Err.044	Main circuit input phase loss	1. Input power cable bad contact; 2. Phase loss fault, i.e. during power on, one phase of R/S/T is too low for over 1s. 3. For the drive of 1KW or more, input single 220VAC	1. Check input power cables 2. Measure R/S/T phase-to-phase voltage to ensure 3 phases are balanced and input power is up to standard. 3. Set P06. 30 to 1, disable this alarm
Err.045	Drive output phase loss	1. Motor UVW bad contact; 2. Motor broken	1. Check UVW wiring 2. Replace motor
Err.046	Drive overload	1. Motor UVW or encoder cable bad contact or loose 2. Motor blocked or brake not released 3. Wrong UVW/encoder cable wiring for multiple drives/motors 4. Motor/drive too small for load 5. Phase loss or wrong phase sequence 6. Motor or drive broken	1. Check UVW/encoder cable wiring 2. Check motor is not blocked and brake is released 3. Check there is no wrong UVW/encoder cable wiring for multiple drives/motors 4. Increase acceleration/deceleration time or choose bigger drive/motor 5. Check UVW wiring 6. Replace drive/motor
Err.047	Motor overload	Same as Err.046	Same as Err.046
Err.048	Electronic gear setting fault	Electronic gear ratio exceeds setting range	Set correct electronic gear
Err.049	Heat sink too hot	1. Fan broken 2. Ambient temperature is too high 3. Too many times of restarting power after overload 4. Inappropriate installation directions and spacing	1. Check fan. Replace fan or drive 2. Measure ambient temperature and improved cooling conditions for servo drive 3. Check error records and see if there has been overload error. Restart after

		5. Servo drive faulty 6. Motor or drive broken	30s. Increase acceleration/deceleration time. 5. Install the servo drive according to specifications in this manual. 6. Power off and wait for 5 minutes. If this error persists, replace drive.
Err.050	Pulse input abnormal	1. Input pulse frequency is larger than maximum frequency setting 2. Input pulse is interfered.	1. Adjust P06.38 2. Check wiring grounding conditions. Use twisted-pair shielded cable. Separate UVW cable from encoder cable.
Err.051	Fully-closed loop position deviation too large	1. External encoder abnormal. 2. Relative settings too conservative.	1. Check external encoder wirings. Replace external encoder. 2. Check parameters of fully-closed loop deviation and protective functions.
Err.054	User forced fault	User uses DI of function 32 FORCE_ERR to forcibly enter faulty state.	Disconnect DI of function 32.
Err.055	Absolute position resetting fault	Absolute encoder absolute position resetting faulty.	Contact HCFA.
Err.056	Main circuit outage	Power outage or main circuit abnormal	Check if there is instantaneous power failure. Increase power voltage capacity.
Err.060	First start after writing customized software	First start after download customized software to the standard driver	Initialize the servo drive.
Err.065	CAN bus off	CAN bus disconnection or receive or send abnormal	Check wiring and connect again
Err.066	Abnormal NMT instruction	Receive NMT stop or reset instruction at servo -ON	NMT node reset, do not stop or reset CAN node at servo-ON
Err.067	CAN bus failure	CAN bus disconnection or receive or send abnormal	Check wiring and connect again
Err.068	External overspeed(reserved)	1. Speed instruction exceeds maximum speed setting value; 2. Wrong UVW phase sequence; 3. Speed response over modulation; 4. Drive faulty	1. Lower speed instruction 2. Check if UVW phase sequence is correct; 3. Adjust speed loop gains to reduce over shoot; 4. Replace drive
Err.069	Hybrid deviation too large	1. External encoder disconnection 2. External encoder damage 3. Drive error	1. Check or replace external encoder and wiring 2. Check or replace external encoder and wiring 3. Check mechanical drive and repair

Err.071	Node protection or heartbeat timeout	Do not receive any response when node protection and heartbeat monitoring reaches specified time	Check node and NMT node reset
Err.072	Synchronization failure	Synchronization failure with host controller at CANOpen IP mode	NMT node reset or 6040 send failure reset instruction
Err.073	CANOpen track buffer underflow	Synchronous clock lost more than 2 times at CANOpen IP or CSP mode	Check interference in communication and host controller operate normally. NMT node reset or 6040 send failure reset instruction
Err.074	CANOpen track buffer overflow	Synchronization clock goes too fast or the actual clock frequency is inconsistent with setting value in CANOpen IP or CSP mode	Check interference in communication and host controller operate normally. NMT node reset or 6040 send failure reset instruction
AL.080	Undervoltage warning	DC bus voltage is relatively low.	1. Check main circuit. 2. Adjust P06.36
AL.081	Drive overload warning	Same as Err.046	Same as Err.046
AL.082	Motor overload warning	Same as Err.046	Same as Err.046
AL.083	Parameter modification needs power restart	Modify parameters which needs restarting.	Restart power
AL.084	Servo not ready	S-ON when servo is not ready.	S-ON after detecting S-RDY signal.
AL.085	E2PROM frequency writing warning	Operating E2PROM too frequent.	Reduce E2PROM using frequency. Use communication2 which do not save in E2PROM.
AL.086	Positive over-travel warning	1. P_OT & N_OT valid simultaneously 2. Servo over-travel in some directions. Can be removed automatically.	Trigger positive limit switch, check operation mode, move the servo towards negative direction. After leaving positive limit switch, this alarm will be removed automatically.
AL.087	Negative over-travel warning	Same as AL.086	Trigger negative limit switch, check operation mode, move the servo towards positive direction. After leaving negative limit switch, this alarm will be removed automatically.
AL.088	Positive instruction overspeed	1. Electronic gear ratio too large 2. Pulse frequency too high	1. Reduce electronic gear ratio 2. Reduce pulse frequency
AL.090	Absolute encoder angle initialization warning	Angle is over 7.2 degree.	Replace motor
AL.093	Regenerative overload	1. Regenerative resistor wrong wiring or bad contact;	1. Check resistor wiring 2. Check internal resistor wiring;

		2. Internal resistor wiring breakage; 3. Resistor capacity insufficient; 4. Resistor resistance too large and causing long time braking; 5. Input voltage exceeds specifications 6. Resistor resistance, capacity or heating time constant parameters settings are wrong; 7. Drive faulty	3. Increase resistor capacity 4. Reduce resistor resistance; 5. Reduce input voltage 6. Set correct parameters 7. Replace drive
AL.094	Regenerative resistor too small	1. External regenerative resistor is less than minimum value 2. Wrong parameter settings	1. Replace resistor 2. Check parameters P00.21~P00.24
AL.095	Emergency stop	Emergency stop is triggered.	This is a normal DI function (function 30)
AL.096	Homing error	1. Homing time exceeds P08.95 2. P08.90 is set is 3, 4, or 5 and contacted limit switches 3. Contact limit switches twice when not using limit switches as origin points.	1. Increase the value of P08.95; 2. Reduce homing speeds P08.92, P08.93
AL.097	Encoder battery undervoltage	Encoder battery voltage is lower than what's set in P06.48.	Replace battery.