14 Troubleshooting

This chapter provides alarm descriptions and the corrective actions you can use for troubleshooting.

There are four types of alarms: General, Motion control, STO, and Communication. The detailed information is as follows.

General type: alarms caused by hardware or encoder signal errors.

Motion control type: alarms caused by motion control command (in PR mode) errors.

STO type: alarms caused by STO errors.

Communication type: alarms caused by CANopen, DMCNET, EtherCAT, or PROFINET communication errors.

AL.nnn is the alarm format on the 7-segment display, as shown in the following figure.

If the recommended alarm clearing method is DI.ARST, set DI.ARST (alarm reset) to On or P0.001 to 0 for clearing the alarm.

14.1 Alarm list

General type

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
AL001	Overcurrent	○			○
AL002	Overvoltage	○			○
AL003	Undervoltage		○		○
AL004	Motor combination error	○			○
AL005	Regeneration error	○			○
AL006	Overload	○			○
AL007	Excessive deviation of Speed command	○			○
AL008	Abnormal pulse command	○			○
AL009	Excessive deviation of Position command	○			○
AL010	Voltage error during regeneration	○			○
AL011	CN2 communication failed	○			○
AL013	Emergency stop		○		○
AL014	Negative limit error		○	○	
AL015	Positive limit error		○	○	
AL016	Abnormal IGBT temperature	○			○
AL017	EEPROM error	○			○
AL018	OA and OB output error	○			○
AL020	Serial communication timeout		○	○	
AL022	RST power error		○		○
AL023	Early overload warning		○	○	
AL024	Encoder initial magnetic field error	○			○
AL025	Encoder internal error	○			○
AL026	Encoder unreliable internal data	○			○
AL027	Encoder internal reset error	○			○
AL028	Battery voltage error or encoder internal error	○			○
AL029	Gray code error	○			○
AL02A	Number of revolutions of the encoder is in error	○			○
AL02B	Motor data error	○			○
AL02C	Servo drive overload	○			○
AL02F	Blocked rotor protection	○			○
AL030	Motor collision error	○			○
AL031	Motor power cable wiring error	○			○
AL032	Abnormal encoder vibration	○			○
AL033	Motor is in error	○			○
AL034	Encoder internal communication error	○			○
AL035	Encoder temperature exceeds the protective range	○			○
AL036	Encoder alarm status error	○			○
AL042	Voltage input for analog Speed command is too high	○			○
AL044	Servo function operational warning		○	○	
AL045	E-Gear ratio value error	○			○
AL048	OA and OB output error	○			○
AL053	Motor parameter error	○			○
AL056	Excessive motor speed	○			○
AL05C	Motor position feedback error	○			○

14

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
AL060	Absolute position is lost		○	○	
AL061	Encoder undervoltage		○	○	
AL062	Number of revolutions of the absolute encoder overflows (issued by encoder)		○	○	
AL064	Encoder vibration warning		○	○	
AL066	Number of revolutions of the absolute encoder overflows (issued by servo drive)		○	○	
AL067	Encoder temperature warning		○	○	
AL068	Absolute data transmitted by I/O is in error		○	○	
AL069	Wrong motor type	○			○
AL06A	Absolute position is lost		○	○	
AL06B	The error between the servo drive internal position and the encoder position is too large		○	○	
AL06E	Encoder type is unidentifiable	○			○
AL06F	The absolute position is not established		○	○	
AL070	Encoder did not complete the read / write procedure		○	○	
AL071	Number of revolutions of the encoder is in error	○			○
AL072	Encoder overspeed	○			○
AL073	Encoder memory error	○			○
AL074	Encoder single-turn absolute position is in error	○			○
AL075	Encoder absolute number of revolutions is in error	○			○
AL077	Encoder internal error	○			○
AL079	Encoder parameter setting incomplete	○			○
AL07A	Encoder Z phase position is lost	○			○
AL07B	Encoder memory is busy	○			○
AL07C	Command to clear the absolute position is issued when the motor speed is over 200 rpm		○	○	
AL07D	Motor stops operating when servo drive power is cycled before AL07C is cleared	○			○
AL07E	Error occurs when the encoder clears the procedure	○			○
AL07F	Encoder version error	○			○
AL083	Servo drive outputs excessive current	○			○
AL085	Regeneration setting error	○			○
AL086	Regenerative resistor overload	○			○
AL088	Servo function operational alarm	○			○
AL089	Current detection interference		○	○	
AL08A	Auto tuning function - command error		○	○	
AL08B	Auto tuning function - dwell time is too short		○	○	
AL08C	Auto tuning function - inertia estimation error		○	○	
AL099	DSP firmware error	○			○
AL09C	Parameter reset failed	○			○
AL09F	Capacitor charging error	○			○
AL0A6	Absolute positions of the servo drive and motor do not match		○	○	
AL35F	Emergency stop during deceleration		○	○	
AL3CF	Emergency stop		○		○
AL422	Write-in failed caused by power supply cut-off	○			○
AL521	Vibration elimination parameter error	○			○
ALC31	Motor power cable disconnection	○			○

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
ALCDB	Servo drive model type error	○			○

Note: if the servo drive shows an alarm that is not in this table, contact the local distributor or technician.

Motion control type

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
AL207	Parameter group of Type [8] PR is out of range		○	○	
AL209	Parameter number of Type [8] PR is out of range		○	○	
AL211	Parameter format setting of Type [8] PR is in error		○	○	
AL213	Parameter setting of Type [8] PR is in error		○	○	
AL215	Parameter written by Type [8] PR is read-only		○	○	
AL217	Parameter written by Type [8] PR is write-protected when Servo On		○	○	
AL219	Parameter written by Type [8] PR is write-protected		○	○	
AL231	Monitoring variable code specified by Type [8] PR is out of range		○	○	
AL235	Position counter overflow warning		○	○	
AL237	Rotary axis position is undefined		○	○	
AL245	PR positioning timeout	○			○
AL249	PR path number is out of range	○			○
AL283	Software positive limit		○	○	
AL285	Software negative limit		○	○	
AL289	Position counter overflows		○	○	
AL380	Position offset alarm for DO.MC_OK		○	○	
AL3F1	Absolute position command of the communication type servo drive is in error	○			○
AL400	Rotary axis position setting error	○			○
AL404	PR special filter setting value is too great	○			○
AL510	Internal parameter update program of the servo drive is abnormal		○	○	
AL520	Calculation program timeout	○			○
AL555	System failure	○			○
AL809	PR motion setting error or command decoding error	○			○

Note: if the servo drive shows an alarm that is not in this table, contact the local distributor or technician.

STO type

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
AL500	STO function is enabled	○			○
AL501	SF1 lost (signal loss or signal error)	○			○
AL502	SF2 lost (signal loss or signal error)	○			○
AL503	STO self-diagnostic error	○			○

Note: if the servo drive shows an alarm that is not in this table, contact the local distributor or technician.

14

Communication type

Display	Alarm name	Error type		Servo state	
		ALM	WARN	ON	OFF
AL111	Buffer overflow occurs when SDO is received	○		○	
AL112	Buffer overflow occurs when PDO is received	○		○	
AL113	TxPDO transmission failed	○		○	
AL121	Object's index does not exist when PDO is accessed	○		○	
AL122	Object's sub-index does not exist when PDO is accessed	○		○	
AL123	Data length error occurs when PDO is accessed	○		○	
AL124	Data range error occurs when PDO is accessed	○		○	
AL125	PDO object is read-only and write-protected	○		○	
AL126	Specified object does not support PDO mapping	○		○	
AL127	PDO object is write-protected when servo drive is on	○		○	
AL128	Error occurs when PDO object is read from EEPROM	○		○	
AL129	Error occurs when PDO object is written to EEPROM	○		○	
AL130	Accessing address of EEPROM is out of range	○		○	
AL131	EEPROM CRC calculation error	○		○	
AL132	Parameter is write-protected	○		○	
AL170	Bus communication timeout	○		○	
AL180	Bus communication timeout	○			○
AL185	Bus hardware error	○			○
AL186	Bus data transmission error	○		○	
AL201	Initialization error of object dictionary data	○			○
AL301	CANopen synchronization failure		○	○	
AL302	Synchronization signal of CANopen is sent too soon		○	○	
AL303	CANopen synchronization signal timeout		○	○	
AL304	Invalid interpolation mode command		○	○	
AL305	SYNC period error		○	○	
AL3E1	Communication fails to synchronize	○			○
AL3E2	Communication synchronization signal is sent too soon	○			○
AL3E3	Communication synchronization signal timeout	○			○
AL401	NMT reset command is received when servo is on	○			○

Note: if the servo drive shows an alarm that is not in this table, contact the local distributor or technician.

14.2 Causes and corrective actions

AL001 Overcurrent	
Trigger condition and cause	Condition: main circuit current is greater than 1.5 times the maximum instantaneous current of the servo drive. Cause: 1. The servo drive output is short-circuited. 2. Motor wiring is in error. 3. IGBT is abnormal.
Checking method and corrective action	1. Check the connection between the motor and servo drive and make sure that the wire is not short-circuited. Do not expose the metal part of the wiring. Check if you have followed the wiring sequence for connecting the motor to the servo drive as described in this manual. 2. If the temperature of the heat sink is abnormal, send your servo drive back to the distributor or contact Delta. Check if the set value of the parameter is much greater than the default. It is recommended that you reset the parameter to the factory default setting and then modify the setting gradually.
How to clear the alarm?	Cycle power on the servo drive.

AL002 Overvoltage	
Trigger condition and cause	Condition: main circuit voltage exceeds the rated value. Cause: 1. The input voltage of the main circuit is higher than the allowable rated value. 2. Incorrect power input (incorrect power system). 3. Malfunction of the servo drive hardware. 4. Incorrect selection of the regenerative resistor or no connection to an external regenerative resistor.
Checking method and corrective action	1. Use a voltmeter to check if the input voltage of the main circuit is within the allowable rated value (refer to Appendix A Specifications) and check if the power system complies with the specifications. Use the correct power source or connect the transformer and regulator in series to keep the voltage within the specified range. 2. If the alarm occurs when the input voltage of the main circuit measured by the voltmeter is within the allowable rated value, send your servo drive back to the distributor or contact Delta. 3. Check the connection for the regenerative resistor, re-calculate the resistance value of the regenerative resistor, and correctly set the values of P1.052 and P1.053.
How to clear the alarm?	DI.ARST

AL003 Undervoltage	
Trigger condition and cause	Condition: 1. Main circuit voltage is below the rated value. The error type of AL003 is a warning by default. To set AL003 as an alarm, you can set P2.066 [Bit 9] to 1. 2. DC Bus voltage is below P4.024 × $\sqrt{2}$. Cause: 1. The input voltage of the main circuit is lower than the allowable rated value. 2. No voltage input to the main circuit. 3. Incorrect power input (incorrect power system).
Checking method and corrective action	1. Check if the wiring of power supply is correct and the wiring of input power supply for the main circuit is normal. 2. Check the switch of the power supply and use a voltmeter to check the main circuit voltage. 3. Use a voltmeter to check if the power system complies with the specifications. If not, use the correct power source or connect the transformer in series.
How to clear the alarm?	Set P2.066 [Bit 2] to clear AL003: 1. If P2.066 [Bit 2] is set to 0, use DI.ARST to clear the alarm after the voltage is back in the normal range. 2. If P2.066 [Bit 2] is set to 1, the alarm is automatically cleared after the voltage is back in the normal range.

AL004 Motor combination error	
Trigger condition and cause	Condition: an incorrect motor is used with the servo drive. Cause: 1. Motor combination error (the wrong motor is connected to the servo drive). 2. The encoder connector is loose. 3. The encoder is damaged.
Checking method and corrective action	1. Use the correct motor. 2. Check and re-install the encoder connector. 3. If the encoder (motor) is not operating properly, replace the motor.
How to clear the alarm?	Cycle power on the servo drive.

AL005 Regeneration error	
Trigger condition and cause	Condition: an error occurs during regeneration. Cause: 1. Incorrect selection of the regenerative resistor or no connection to an external regenerative resistor. 2. P1.053 (Regenerative resistor capacity) is not set to 0 when the regenerative resistor is not connected. 3. Incorrect parameter settings for P1.052 and P1.053.
Checking method and corrective action	1. Check the connection for the regenerative resistor, re-calculate the resistance value of the regenerative resistor, and correctly set the values of P1.052 and P1.053. If the issue persists, send your servo drive back to Delta. 2. Set P1.053 to 0 if not using a regenerative resistor. 3. Correctly set the regenerative resistor value (P1.052) and the regenerative resistor capacity (P1.053).
How to clear the alarm?	DI.ARST

AL006 Overload	
Trigger condition and cause	Condition: overload of motor and servo drive. Cause: 1. The load is over the rated range and the servo drive is in a continuous overload condition. 2. Improper settings for the parameters of the control system. 3. Motor wiring error. 4. Encoder error.
Checking method and corrective action	1. Monitor if the average load rate [%] is continuously over 100% by setting P0.002 to 12. If so, increase the motor capacity or reduce the load. Refer to Appendix A for Graph of load and operating time. 2. Check if there is any mechanical vibration or the setting for acceleration or deceleration is too drastic. 3. Check if the wiring of the motor power cable and encoder cable is correct. 4. Send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST

AL007 Excessive deviation of Speed command	
Trigger condition and cause	Condition: difference between the command speed and the feedback speed exceeds the allowable range set by P2.034. Cause: 1. A drastic change in the input Speed command. 2. Improper setting of P2.034 (Excessive deviation warning condition of Speed command). 3. Incorrect wiring of the motor power cable and encoder cable.
Checking method and corrective action	1. Use the signal detector to check if the input analog voltage signal is normal. If not, adjust the rate of change for input signals or enable the filter function. 2. Check if the value of P2.034 (Excessive deviation warning condition of Speed command) is set properly. 3. Check if the wiring of the motor power cable and encoder cable is correct.
How to clear the alarm?	DI.ARST

AL008 Abnormal pulse command	
Trigger condition and cause	Condition: the input frequency of the pulse command is over the allowable value for the hardware interface. Cause: the pulse command frequency is higher than the rated input frequency.
Checking method and corrective action	Use the scope to check if the input frequency is higher than the rated input frequency and correctly set the input pulse frequency.
How to clear the alarm?	DI.ARST

14

AL009 Excessive deviation of Position command	
Trigger condition and cause	Condition: difference between the command position and the feedback position exceeds the allowable range set by P2.035. Cause: 1. The maximum allowable position deviation is set too low. 2. Gain value is set too low. 3. Torque limit or speed limit is set too low. 4. Excessive external load. 5. Improper setting for the E-Gear ratio. 6. The power cable is loose. 7. The maximum speed limit is set too low.
Checking method and corrective action	1. Check the set value of P2.035 (Excessive deviation of Position command warning). If the value is too low, set a higher value. 2. Check if the gain value is appropriate for the application. 3. When the speed and torque limit functions are not needed, disable P1.002; otherwise, check if the internal speed limit (P1.009 - P1.011) and internal torque limit (P1.012 - P1.014) are set correctly. 4. Check the external load. Reduce the external load or re-evaluate the motor capacity if necessary. 5. Check if the settings of P1.044 and P1.045 are appropriate for the application. If not, set them to proper values. 6. Check if the power cable is loose. 7. Check if the set value of P1.055 (Maximum speed limit) is too low.
How to clear the alarm?	DI.ARST

AL010 Voltage error during regeneration	
Trigger condition and cause	Condition: an error occurs during regeneration. Cause: 1. The regenerative voltage remains at 400V for a period of time during regeneration. This may be caused by using an incorrect regenerative resistor or not connecting an external regenerative resistor to the servo drive. 2. P1.053 (Regenerative resistor capacity) is not set to 0 when the regenerative resistor is not connected.
Checking method and corrective action	1. Check the connection for the regenerative resistor, re-calculate the resistance value of the regenerative resistor, and correctly set the values of P1.052 and P1.053. If the issue persists, send your servo drive back to Delta. 2. Set P1.053 to 0 if not using a regenerative resistor.
How to clear the alarm?	DI.ARST

AL011 CN2 communication failed	
Trigger condition and cause	Condition: connection to the encoder is in error. Cause: 1. CN2 wiring is incorrect. 2. CN2 connector is loose. 3. CN2 wiring is poor. 4. Connection to the encoder is cut off due to interference. 5. The encoder is damaged. 6. The motor is not supported by this servo drive series.
Checking method and corrective action	1. Check if the wiring follows the instructions in the user manual. If not, connect the wire correctly. 2. Check if the CN2 connector is properly connected to the CN2 port on the servo drive. If the connector is loose, reconnect it to CN2. 3. Check for the cable and connector which connect the motor and CN2 of the servo drive to see if there is any poor wiring or damaged wires. If so, replace the connector and cable. 4. Check the communication error rate by setting P0.002 to -80. If this value increases continuously, it means there is interference. Check the following items: (a) Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. (b) Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. (c) Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 5. If you took all corrective actions but the issue persists, replace the motor. 6. Contact the distributor for the supported motor models or the communication specifications for the encoders.
How to clear the alarm?	Cycle power on the servo drive.

AL013 Emergency stop	
Trigger condition and cause	The emergency stop button is pressed.
Checking method and corrective action	Make sure the emergency stop button is off.
How to clear the alarm?	Set DI.EMGS to off to clear the alarm.

AL014 Negative limit error	
Trigger condition and cause	Condition: negative limit switch is triggered. Cause: 1. Negative limit switch is triggered. 2. Servo system is unstable.
Checking method and corrective action	1. Make sure the negative limit switch is off. 2. Check the parameter setting or re-estimate the motor capacity.
How to clear the alarm?	The alarm is automatically cleared after the motor moves away from the limit.

AL015 Positive limit error	
Trigger condition and cause	Condition: positive limit switch is triggered. Cause: 1. Positive limit switch is triggered. 2. Servo system is unstable.
Checking method and corrective action	1. Make sure the positive limit switch is off. 2. Check the parameter setting or re-estimate the motor capacity.
How to clear the alarm?	The alarm is automatically cleared after the motor moves away from the limit.

AL016 Abnormal IGBT temperature	
Trigger condition and cause	Condition: temperature of IGBT is abnormal. Cause: 1. The load is over the rated range and the servo drive is in a continuous overload condition. 2. The servo drive output is short-circuited.
Checking method and corrective action	1. Check for servo drive overload or motor overcurrent. If so, try increasing the motor's capacity or reducing the load. 2. Check if the wiring of servo drive output is correct.
How to clear the alarm?	DI.ARST

AL017 EEPROM error	
Trigger condition and cause	Condition: error occurs when DSP accesses EEPROM. Cause: 1. Parameter writing error or the value exceeds the allowable range. 2. When power is supplied to the servo drive, the data in ROM is damaged or there is no data in ROM.
Checking method and corrective action	Press the SHIFT key and the panel displays EXGAB. X = 1, 2, 3 G = Group number of the parameter AB = Parameter number in hexadecimal format If the panel displays “E320A”, it indicates parameter P2.010. If the panel displays “E3610”, it indicates parameter P6.016. Check the value for the corresponding parameter. 1. The panel displays the parameter code. If this alarm occurs when power is supplied to the drive, it means a parameter value has exceeded the range. Modify the value and then cycle power on the servo drive. If the alarm occurs during normal operation, it means an error occurred when the parameter is written. Use DI.ARST to clear this alarm. 2. The panel displays “E100X” or “E0001”. If this alarm occurs when power is supplied to the drive, it is usually because the data in ROM is damaged or there is no data in ROM. Send your servo drive back to the distributor or contact Delta.
How to clear the alarm?	If this alarm occurs when power is supplied to the drive, reset the parameters and then cycle the power. If the alarm occurs during operation, set DI.ARST to on.

AL018 OA and OB output error	
Trigger condition and cause	Condition: the output frequency of the OA and OB pulses is higher than the maximum output frequency of the hardware. Cause: 1. The resolution of the OA and OB pulses is set too high. 2. There is interference or cable damage causing communication error. 3. Encoder error.
Checking method and corrective action	1. Correctly set the parameters. The settings of P1.076 and P1.046 should follow these requirements: P1.076 > motor speed and $\frac{\text{Motor speed}}{60} \times P1.046 \times 4 < 19.8 \times 10^6$ 2. Check the communication error rate by setting P0.002 to -80. If this value increases continuously, it means there is interference. Check the following items: (a) Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. (b) Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. (c) Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 3. Check the fault record (P4.000 - P4.004) and see if an alarm has occurred (AL011, AL024, AL025, or AL026). Use the checking methods and corrective actions to clear the alarm if any of them occurs. 4. If you do not need to use the OA and OB pulses, set P2.065 [Bit 13] to 1 to disable the function for OA and OB output error (AL018 / AL048) detection.
How to clear the alarm?	1. DI.ARST 2. Contact the distributor.

AL020 Serial communication timeout	
Trigger condition and cause	Condition: RS-485 communication error. Cause: 1. Improper setting for P3.004 (Modbus communication timeout). 2. The servo drive has not received the communication command for a long time and has timed out (refer to P3.004).
Checking method and corrective action	1. Check and correctly set the value for the communication timeout parameter. 2. Check if the communication cable is loose or disconnected and make sure it is correctly wired.
How to clear the alarm?	DI.ARST

AL022 RST power error	
Trigger condition and cause	Condition: RST power cable is loose or there is no power. The error type of AL022 is a warning by default. To set AL022 as an alarm, you can set P2.066 [Bit 12] to 1. Cause: RST power error.
Checking method and corrective action	Check if the RST power cable is loose or there is no power. For 1.5 kW (or below) ASDA-B3 servo drives, this alarm occurs when all three phases are not connected to the power supply. For 2 kW (or above) ASDA-B3 servo drives, this alarm occurs when one single phase is not connected to the power supply. Correctly connect the power to the servo drive. If the issue persists, send your servo drive back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST

AL023 Early overload warning	
Trigger condition and cause	Early overload warning.
Checking method and corrective action	1. Check if the motor is overloaded and refer to the corrective actions for AL006 for troubleshooting. 2. Check if the value of P1.056 (Motor output overload warning level) is set too low. If so, set the value higher, or set the value greater than 100 to disable the warning function.
How to clear the alarm?	DI.ARST

AL024 Encoder initial magnetic field error	
Trigger condition and cause	Condition: the magnetic field of the encoder U, V, W signal is in error. Cause: the initial magnetic field of the encoder is in error (magnetic field of the encoder U, V, W signal is in error.)
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL025 Encoder internal error	
Trigger condition and cause	Condition: internal memory and counter of the encoder are in error. Cause: 1. Encoder internal error (internal memory and counter are in error). 2. When power is applied, the motor rotates because of the inertia of the mechanical parts or other causes.
Checking method and corrective action	1. If there is interference, check the following items: (a) Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. (b) Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. (c) Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 2. Make sure the motor shaft does not move when power is turned on.
How to clear the alarm?	Cycle power on the servo drive.

AL026 Encoder unreliable internal data	
Trigger condition and cause	Condition: internal data error occurs three consecutive times. Cause: 1. External interference. 2. Malfunction of the encoder hardware.
Checking method and corrective action	If there is interference, check the following items: 1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the communication error rate by setting P0.002 to -80. If the value is greater than 0 and increases continuously, check the previous three items again. If the value is 0, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL027 Encoder internal reset error	
Trigger condition and cause	Condition: encoder reset error. Cause: encoder reset.
Checking method and corrective action	1. Check if there is poor connection for the encoder signal cable. 2. Check if the power supply for the encoder is stable and make sure to use shielded cable. 3. Check if the operating temperature is over 95°C (203°F). Identify the cause for the high temperature and do not restart the operation before the temperature falls within the allowable range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL028 Battery voltage error or encoder internal error	
Trigger condition and cause	Condition: battery voltage is higher than the specification (> 3.8V) or the encoder signal is in error. Cause: 1. Voltage level of the battery is too high. 2. Encoder internal error.
Checking method and corrective action	1. Check if there is a charging circuit. Avoid incorrect wiring. If Pin 1 (5V) of CN2 is connected to BAT+ of the encoder connector, it means the 5V power of the servo drive is being charged to the battery. 2. Check if the battery is correctly installed. (voltage > 3.8V) 3. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 4. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 5. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. If the issue persists, send your servo drive and motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL029 Gray code error	
Trigger condition and cause	Absolute position within a single revolution is in error.
Checking method and corrective action	Cycle power on the servo drive to operate the motor. Then, check if the alarm occurs again. If the issue persists, replace the encoder.
How to clear the alarm?	Cycle power on the servo drive.

AL02A Number of revolutions of the encoder is in error	
Trigger condition and cause	Condition: the number of revolutions of the encoder is in error. Cause: the internal signal of the encoder is abnormal causing error in the number of revolutions.
Checking method and corrective action	Send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	N/A

AL02B Motor data error	
Trigger condition and cause	Accessing the internal data of the motor is in error.
Checking method and corrective action	Send your servo motor back to Delta.
How to clear the alarm?	N/A

AL02C Servo drive overload	
Trigger condition and cause	Condition: servo drive is overloaded. Cause: 1. The load is over the rated range and the servo drive is in a continuous overload condition. 2. Improper settings for the gain parameters or the motion profile of the control system. 3. Motor wiring error. 4. The encoder is damaged or malfunctioning.
Checking method and corrective action	1. Monitor the current feedback by setting P0.002 to 55. Check if the motor current exceeds the rated output current of the servo drive for a long period of time. 2. (a) Check if there is any mechanical vibration. If so, properly adjust the gain parameters. (b) Set a higher acceleration / deceleration time constant or a lower target speed. 3. Check if the wiring of the motor power cable and encoder cable is correct. 4. Replace the encoder.
How to clear the alarm?	DI.ARST

AL02F Blocked rotor protection	
Trigger condition and cause	Condition: the servo drive is overloaded, and the motor speed keeps at 10 rpm (or below) or the rotor is blocked. Cause: 1. The motor or the connected mechanical part is locked, causing the motor not to rotate. 2. The motor is running at an extremely low speed or the rotor is blocked for a long time.
Checking method and corrective action	1. Set the motor speed higher to shorten the duration of the occurrence of blocked rotor. 2. Check if the mechanical part connected to the motor is working normally. 3. Check if the wiring of the motor power cable and encoder cable is correct. 4. Send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST

AL030 Motor collision error	
Trigger condition and cause	Condition: the motor hits the device, reaching the torque value set by P1.057 for the duration of the time set by P1.058. Cause: 1. Check if the protection function of motor hard stop (P1.057) is enabled. If so, set P1.057 to 0. 2. Check if the value set by P1.057 is too low and the time set by P1.058 is too short. Set P1.057 according to the actual torque. If P1.057 is set too low, it may lead to malfunction; if P1.057 is set too high, it may lose the protection function.
Checking method and corrective action	Cycle power on the servo drive to operate the motor. Then, check if the alarm occurs again. If the issue persists, replace the encoder.
How to clear the alarm?	DI.ARST

AL031 Motor power cable wiring error	
Trigger condition and cause	Condition: incorrect wiring of the motor power cable (U, V, W) and ground (GND). Cause: incorrect wiring of the motor power cable (U, V, W) and ground (GND). The switch for wiring error detection is set by P2.065 [Bit 8], which is enabled by default.
Checking method and corrective action	Check if the wiring of the motor power cable (U, V, W) and ground (GND) is correct. Follow the instructions in this user manual for correct wiring and proper grounding.
How to clear the alarm?	Cycle power on the servo drive.

AL032 Abnormal encoder vibration	
Trigger condition and cause	Condition: abnormal vibration occurred in the encoder. Cause: the internal signal or mechanical part of the encoder is abnormal, so the encoder returns an error signal.
Checking method and corrective action	Check if the motor vibration range exceeds the specification of 2.5 G. If the vibration is within the range but the alarm still occurs, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL033 Motor is in error	
Trigger condition and cause	The encoder signal is in error.
Checking method and corrective action	1. Check if the encoder 5V power is lower than 4.3V. 2. Check if the cable complies with the specifications. 3. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference.
How to clear the alarm?	If the issue persists, send your servo motor back to the distributor or contact Delta.

AL034 Encoder internal communication error	
Trigger condition and cause	Condition: 1. Internal communication error for the absolute encoder. 2. Internal error for other types of encoder. Cause: encoder internal communication error.
Checking method and corrective action	1. Check if the battery wiring is correct or loose. If it is loose, wire it again and cycle power on the system. 2. Check if the battery voltage is within the normal range. 3. Internal communication error for the absolute encoder occurs. Replace the motor.
How to clear the alarm?	Cycle power on the servo drive.

AL035 Encoder temperature exceeds the protective range	
Trigger condition and cause	Condition: encoder temperature is over the upper limit of 100°C (212°F). Cause: encoder temperature is over 100°C.
Checking method and corrective action	Set P0.002 to -124 to read the temperature and check if it is below 100°C. If the encoder temperature is higher than 100°C, improve the heat dissipation to lower the temperature. If the temperature difference between the encoder and motor is over 30°C (86°F), send your servo motor back to Delta.
How to clear the alarm?	After the temperature becomes lower than 100°C, cycle power on the servo drive.

AL036 Encoder alarm status error	
Trigger condition and cause	Condition: abnormal state occurred in the encoder. Cause: the encoder sends out an alarm signal, but the alarm status of the encoder read by the servo drive shows no error.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL042 Voltage input for analog Speed command is too high	
Trigger condition and cause	Voltage input for the analog Speed command is higher than the level specified by P1.083.
Checking method and corrective action	Check and make sure the voltage source for the analog Speed command is correct. Check the value of P1.083, and if this function not required, set it to 0.
How to clear the alarm?	DI.ARST

AL044 Servo function operational warning	
Trigger condition and cause	Condition: too many motor control functions on the servo drive are enabled. Cause: servo function operational alarm.
Checking method and corrective action	1. If using a filter, see if using this filter is necessary. 2. Set P2.066 [Bit 4] to 1 to disable this alarm.
How to clear the alarm?	1. Disable the filter if it is not required, such as the low-pass filter (P1.006 - P1.008), moving filter (P1.068), low-frequency vibration suppression (P1.025 - P1.028), vibration elimination (P1.089 - P1.094), Notch filter (1st to 5th sets), percentage of friction compensation (P1.062), and motor hard stop (torque percentage) (P1.057). 2. Set P2.066 [Bit 4] to 1 and cycle power on the servo drive.

AL045 E-Gear ratio value error	
Trigger condition and cause	Condition: when the value of the E-Gear ratio exceeds the range (1 - 262144), this alarm occurs once power is cycled on the servo drive. Cause: E-Gear ratio value is found to be in error after the servo drive is powered on.
Checking method and corrective action	Check if the value of the E-Gear ratio is within the allowable range (1 - 262144). If not, correct the value and then cycle power to the servo drive.
How to clear the alarm?	Cycle power on the servo drive after correcting the value.

AL048 OA and OB output error	
Trigger condition and cause	Condition: the output frequency of the OA and OB pulses is higher than the maximum output frequency of the hardware. Cause: 1. The resolution of the OA and OB pulses is set too high. 2. There is interference or cable damage causing communication error. 3. Encoder error.
Checking method and corrective action	1. Correctly set the parameters. The settings of P1.076 and P1.046 should follow these requirements: P1.076 > motor speed and $\frac{\text{Motor speed}}{60} \times P1.046 \times 4 < 19.8 \times 10^6$ 2. Check the communication error rate by setting P0.002 to -80. If this value increases continuously, it means there is interference. Check the following items: (a) Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. (b) Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. (c) Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 3. Check the fault record (P4.000 - P4.004) and see if an alarm has occurred (AL011, AL024, AL025, or AL026). Use the corresponding checking methods and corrective actions to clear the alarm if any of them occurs. 4. If you do not need to use the OA and OB pulses, set P2.065 [Bit 13] to 1 to disable the function for OA and OB output error (AL018 / AL048) detection.
How to clear the alarm?	1. DI.ARST 2. Contact the distributor.

AL053 Motor parameter error	
Trigger condition and cause	Motor parameter is in error.
Checking method and corrective action	Check the motor barcode in the Device Information screen of the ASDA-Soft or replace the motor.
How to clear the alarm?	Cycle power on the servo drive.

14

AL056 Excessive motor speed	
Trigger condition and cause	Condition: when the filtered motor speed exceeds the setting of P1.111, the servo drive immediately switches to the Servo Off state and displays this alarm. Cause: this alarm is to remind the user that the motor speed has reached the maximum limit (setting value of P1.111).
Checking method and corrective action	1. Check the reason for the high motor speed, such as the set value of P1.111 is too small or the bandwidth is not set properly. 2. Evaluate the motor speed and the condition of the mechanical parts. If allowable, increase the speed and the set value of P1.111.
How to clear the alarm?	DI.ARST

AL05C Motor position feedback error	
Trigger condition and cause	Condition: sudden jumps occur to the motor position feedback. Cause: 1. Encoder feedback is abnormal or the encoder is damaged. 2. Encoder feedback is interfered.
Checking method and corrective action	1. Check if the feedback signal is abnormal. Use the software scope and select **Feedback position [PUU]** as the input signal for the channel and sample at 16 kHz or 20 kHz, and then operate the motor manually to monitor whether the feedback value has discontinuous sudden jumps. 2. Check if the feedback signal is interfered, causing sudden jumps to the motor position feedback. 3. Check if the communication error rate increases due to interference. For example, check the communication error rate by setting P0.017 to -80 and monitor whether the value of P0.009 is not 0 and continuously increases.
How to clear the alarm?	Cycle power on the servo drive.

AL060 Absolute position is lost	
Trigger condition and cause	Condition: losing the recorded number of revolutions because of low battery voltage or loss of power. Cause: 1. Voltage level of the battery is too low. 2. The battery is replaced when the control power of the servo drive is off. 3. The battery is not installed when the absolute function is enabled. 4. Poor connection or disconnection of the battery power circuit.
Checking method and corrective action	1. Check if the battery voltage is below 2.9V. Re-establish the absolute origin position after replacing the battery. 2. Do not replace or remove the battery when the servo drive's control power is off. 3. Follow these instructions: (a) Install the battery. (b) Check the wiring between the battery box and the servo drive. (c) Check the encoder wiring. 4. Ensure the wiring is correct so that the battery power is supplied to the encoder and then re-establish the absolute origin position.
How to clear the alarm?	Connect or reconnect the wiring so that the battery power is supplied to the encoder and then re-establish the absolute origin position. For establishing the absolute origin position, refer to Section 10.3.4 for more details.

AL061 Encoder undervoltage	
Trigger condition and cause	Condition: battery voltage of the absolute encoder is lower than the rated value (3.1V). Cause: voltage level of the battery is too low.
Checking method and corrective action	1. Read the battery voltage by setting P0.002 = 38 to see if it is below 3.1V. 2. Measure the battery voltage to see if it is below 3.1V. If the voltage is too low, replace the battery when the servo drive's control power is On.
How to clear the alarm?	The alarm is cleared automatically when the battery voltage is higher than 3.1V.

AL062 Number of revolutions of the absolute encoder overflows (issued by encoder)	
Trigger condition and cause	Condition: the number of revolutions of the absolute motor exceeds the range of -32768 to +32767. Cause: motor's rotation cycle exceeds the allowable range.
Checking method and corrective action	1. Check if the number of revolutions of the motor during operation is within the range of -32768 to +32767. If not, re-establish the absolute origin position. 2. Make sure you have enabled the function of preventing rotary axis position offset when overflow occurs. If it is disabled, set P2.069.Z to 1 to enable the function.
How to clear the alarm?	Cycle power on the servo drive.

AL064 Encoder vibration warning	
Trigger condition and cause	Condition: abnormal vibration occurred in the encoder. Cause: the internal signal or mechanical part of the encoder is abnormal, so the encoder returns a warning signal.
Checking method and corrective action	Check if the motor vibration range is within the warning range (2.0 to 2.5 G). If the vibration is below the warning range but the alarm still occurs, send you servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL066 Number of revolutions of the absolute encoder overflows (issued by servo drive)	
Trigger condition and cause	Condition: 1. The number of revolutions of the absolute motor (P0.051) exceeds half the number of revolutions of the encoder resolution. 2. The number of revolutions of a Delta motor is -32768 to +32767. Cause: motor's rotation cycle exceeds the allowable range.
Checking method and corrective action	1. Check if the motor's number of revolutions during operation is within the specified range. If not, re-establish the absolute origin position. 2. Make sure you have enabled the function of preventing rotary axis position offset when overflow occurs. If it is disabled, set P2.069.Z to 1 to enable the function.
How to clear the alarm?	Re-establish the absolute origin position.

AL067 Encoder temperature warning	
Trigger condition and cause	Condition: the encoder temperature is over the warning level of 85°C (185°F), but still under 100°C (212°F), which is within the protective range. Cause: encoder temperature warning (85°C to 100°C).
Checking method and corrective action	Set P0.002 to -124 to read the encoder temperature and check if it matches the motor temperature. If the temperature is too high, improve the heat dissipation or decrease the operating temperature. If the temperature difference between the encoder and motor is over 30°C (86°F), send your servo motor back to Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL068 Absolute data transmitted by I/O is in error	
Trigger condition and cause	Condition: the time sequence is wrong when the absolute position is read by DI/O. Cause: 1. Time sequence is wrong. 2. Reading timeout.
Checking method and corrective action	1. Correct the time sequence for reading the data with DI/O: (a) DI.ABSQ switches to off after DO.ABSR is off. (b) DI.ABSQ switches to on after DO.ABSR is on. 2. Check the duration from when DO.ABSR switches on to the time when DI.ABSQ switches on and see if this duration is over 200 ms. The correct procedure should be: when DO.ABSR switches on and after the bit data of absolute position is ready, read DO.ABSD within 200 ms, switch DI.ABSQ on, and then inform the servo drive that data reading is complete.
How to clear the alarm?	Cycle power on the servo drive.

AL069 Wrong motor type	
Trigger condition and cause	Incremental motor does not support the absolute function.
Checking method and corrective action	1. Check whether your servo motor has an incremental or absolute encoder. 2. Check the setting of P2.069 and correctly set the value. Set P2.069.X to 0 if desiring to operate the absolute motor as an incremental motor.
How to clear the alarm?	Set P2.069.X to 0 and then cycle power on the servo drive.

14

AL06A Absolute position is lost	
Trigger condition and cause	There are two conditions that may cause the loss of absolute position. In the first condition, the absolute position is not established. Thus, the origin is lost. In the other condition, an error occurred. After the absolute origin position is established, AL06A still occurs after power cycling of the servo drive. ■ Absolute position is not established. Condition: 1. The servo drive is used for the first time. 2. The battery is drained and the control power of the servo drive is cut off. 3. When the bus communication type servo drive is used with an absolute motor, the user issues an absolute position command after the first use or modification of the E-Gear ratio. Cause: 1. The servo drive is used for the first time, so the absolute origin position is not established. 2. Retaining the absolute position requires power supply, so when the battery is drained and the power supply of the servo drive is cut off, the absolute position of the servo is lost. 3. After the E-Gear ratio is modified, the position system of the communication type servo drive needs to be re-established. ■ An error occurred. Condition: 1. The encoder cable is damaged, including the exterior and internal wiring. 2. There is a momentary power failure in the battery power supply. 3. The absolute motor is in error. 4. The battery box is used, and J1 and J2 are connected reversely. 5. The voltage level of the battery is lower than 2.9V. Cause: 1. Power supply is unstable due to damage of the encoder cable. 2. The reason for the momentary power failure may be that the battery box connector is loose or excessive machine vibration. 3. The absolute encoder of this motor is in error. 4. If J1 and J2 are connected reversely, the battery cannot charge the capacitor. The capacitor functions as a buffer to supply power when the power supply of the servo drive power is switched to the battery due to a main power failure.

AL06A Absolute position is lost	
Checking method and corrective action	1. Check if the absolute origin position is established (refer to Section 10.3.1 for more information). 2. Avoid replacing the battery when the servo drive is powered off. It is suggested that you replace the battery when the servo drive is powered on, so the absolute encoder has continuous power supply. 3. Re-establish the absolute origin position. 4. Replace the encoder cable. Use the X-ray to check if the internal wiring is damaged. 5. Check if the wiring is loose. If the wiring is fine, replace the battery box for cross-testing. 6. Replace the servo motor. 7. Ensure J1 is connected to the battery and J2 is connected to the servo drive.
How to clear the alarm?	This alarm is automatically cleared after you establish the absolute origin position.

AL06B The error between the servo drive internal position and the encoder position is too large	
Trigger condition and cause	Condition: when the absolute motor is powered by the battery, the number of motor rotations exceeds half the number of revolutions of the encoder. Cause: the error between the servo drive internal position and the encoder position is too large.
Checking method and corrective action	The mechanical parts are not properly fastened when the machine is being transported causing rotation of the motor.
How to clear the alarm?	Re-establish the absolute origin position.

AL06E Encoder type is unidentifiable	
Trigger condition and cause	The servo drive cannot identify the encoder type.
Checking method and corrective action	N/A
How to clear the alarm?	Replace the motor immediately.

AL06F The absolute position is not established	
Trigger condition and cause	Condition: the establishment of the absolute position has timed out. Cause: the process for establishing the absolute position of the servo drive is in error.
Checking method and corrective action	If the issue persists after you cycle power on the servo drive and re-establish the absolute origin position, contact your local distributor or technician.
How to clear the alarm?	Cycle power on the servo drive and re-establish the absolute origin position.

AL070 Encoder did not complete the read / write procedure	
Trigger condition and cause	Reading and writing commands are not complete.
Checking method and corrective action	Check if the wiring is correct and firmly connected. If not, correctly connect the wire again. Contact Delta if this error persists.
How to clear the alarm?	Cycle power on the servo drive.

AL071 Number of revolutions of the encoder is in error	
Trigger condition and cause	Condition: the number of revolutions of the encoder is in error. Cause: the internal signal of the encoder is abnormal causing error in the number of revolutions of the encoder.
Checking method and corrective action	If you executed DI.ARST but the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	DI.ARST

AL072 Encoder overspeed	
Trigger condition and cause	1. When the encoder is powered by the servo drive: over 8,800 rpm. 2. When the encoder is powered by the battery: over 10,000 rpm. 3. Battery voltage is too low.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. 5. Measure the battery voltage to see if it is below 3.1V. 6. Check if the battery wiring has poor contact. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL073 Encoder memory error	
Trigger condition and cause	An error occurs when the encoder is reading data from or writing data to EEPROM.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL074 Encoder single-turn absolute position is in error	
Trigger condition and cause	The single-turn position in the encoder is in error.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL075 Encoder absolute number of revolutions is in error	
Trigger condition and cause	The absolute number of revolutions in the encoder is in error.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL077 Encoder internal error	
Trigger condition and cause	Encoder internal error (internal computing error).
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL079 Encoder parameter setting incomplete	
Trigger condition and cause	The servo drive is not cycled after the encoder parameter is written to the encoder, so the parameter value is not updated.
Checking method and corrective action	Check if the encoder parameter is written. If so, cycle power to have the parameter setting take effect.
How to clear the alarm?	Cycle power on the servo drive.

AL07A Encoder Z phase position is lost	
Trigger condition and cause	Encoder Z phase position is in error.
Checking method and corrective action	Send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	N/A

AL07B Encoder memory is busy	
Trigger condition and cause	The encoder memory is busy.
Checking method and corrective action	1. Check if the motor is properly grounded. Make sure the ground end (yellow / green) of the power cable is grounded to the servo drive heat sink. 2. Check if the connection for the encoder signal cable is normal. Make sure the encoder signal cable is separated from the power supply or any high-current cables to avoid interference. 3. Use shielded cable for the encoder cable. Pull out the wire mesh and have it correctly grounded. 4. Check the motor speed and make sure it is within the rated range. If the issue persists, send your servo motor back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL07C Command to clear the absolute position is issued when the motor speed is over 200 rpm	
Trigger condition and cause	The command to clear the absolute position is issued when the motor speed is over 200 rpm.
Checking method and corrective action	1. Check if a command to clear the absolute position is issued when the motor speed is over 200 rpm. If so, reduce the motor speed until the speed is lower than 200 rpm, and then follow the procedure for clearing the absolute position to clear this alarm. 2. Do not issue a command to clear the absolute position when the motor speed is over 200 rpm.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL07D Motor stops operating when servo drive power is cycled before AL07C is cleared	
Trigger condition and cause	AL07C occurs and is not cleared before the power is cycled on the servo drive, and the motor stops operating.
Checking method and corrective action	Use DI.ARST to clear the alarm. Once this alarm is cleared, AL07C occurs. Follow the checking method and corrective action to clear AL07C.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL07E Error occurs when the encoder clears the procedure	
Trigger condition and cause	The number of retry attempts for the encoder to clear the procedure exceeds 11 times.
Checking method and corrective action	If the issue persists, check the communication quality of the encoder by setting P0.002 to -80. If the communication is normal, use DI.ARST to clear this alarm.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL07F Encoder version error	
Trigger condition and cause	The encoder version read by the servo drive is in error.
Checking method and corrective action	N/A
How to clear the alarm?	Replace the motor immediately.

AL083 Servo drive outputs excessive current	
Trigger condition and cause	Condition: during general operation, this alarm occurs when the servo drive outputs current that is over the allowable level specified by the firmware. This alarm protects IGBT from overheating or burning because of the high current. Cause: 1. UVW of the servo drive is short-circuited. 2. Motor wiring is in error. 3. The GND for the analog signal of the servo drive is interfered.
Checking method and corrective action	1. Check the motor power cable and its connector. If metal wire is exposed or the wire is torn, the UVW can short-circuit. In this case, replace the power cable to avoid a short circuit. 2. Refer to Chapter 3 Wiring and check the following items: (a) If you do not use the Delta standard power cable, make sure the UVW wiring sequence is correct. (b) Make sure the UVW wiring between the servo drive and motor is correctly connected. 3. Check if the GND for analog signal is mistakenly connected to another ground signal (incorrect connection can cause interference). Do not share the GND for analog signal with other signal source. Follow the wiring instructions in Chapter 3.
How to clear the alarm?	DI.ARST

14

AL085 Regeneration setting error	
Trigger condition and cause	Condition: regeneration control error. Cause: regenerative resistor is not operating, but the regenerative voltage remains at 400V for a period of time.
Checking method and corrective action	Check the connection for the regenerative resistor, re-calculate the resistance value of the regenerative resistor, and correctly set the values of P1.052 and P1.053. If the issue persists, send your servo drive back to Delta.
How to clear the alarm?	DI.ARST

AL086 Regenerative resistor overload	
Trigger condition and cause	Condition: excessive energy in the capacitor of the servo drive is released to the regenerative resistor causing overload of the resistor. Cause: 1. Incorrect selection of the regenerative resistor or no connection to an external regenerative resistor. 2. Incorrect parameter settings for P1.052 and P1.053. 3. Other energy (such as interference) is input to the servo drive or the input voltage is higher than the allowable rated voltage. 4. Malfunction of the servo drive hardware.
Checking method and corrective action	1. Check the connection for the regenerative resistor and correctly set the values of P1.052 and P1.053. 2. Re-assess whether the regenerative energy exceeds the value of P1.053. If the regenerative energy exceeds the set value, replace the regenerative resistor with a regenerative resistor that has a higher capacity. 3. Use a voltmeter to measure if the input voltage from the power supply is within the allowable rated voltage (refer to Appendix A Specifications). If the input voltage exceeds the rated range, remove the interference source. 4. Measure the voltage between P3 and ⊖ terminals. If it does not match the displayed DC Bus voltage when you enter the monitoring code 14 to P0.002, the servo drive may be malfunctioning. Send your servo drive back to the distributor or contact Delta. 5. If you took the preceding actions and the issue persists, use a scope with a differential probe to measure whether the input voltage has high-frequency signal interference. If there is interference, remove the interference source, and use the correct power source or connect the regulator in series.
How to clear the alarm?	DI.ARST

AL088 Servo function operational alarm	
Trigger condition and cause	Condition: too many motor control functions on the servo drive are enabled. Cause: servo function operational alarm.
Checking method and corrective action	If using a filter, see if using this filter is necessary.
How to clear the alarm?	Disable the filter if it is not required, such as the low-pass filter (P1.006 - P1.008), moving filter (P1.068), low-frequency vibration suppression (P1.025 - P1.028), vibration elimination (P1.089 - P1.094), Notch filter (1st to 5th sets), percentage of friction compensation (P1.062), and motor hard stop - torque percentage (P1.057).

AL089 Current detection interference	
Trigger condition and cause	Condition: current detection interference. Cause: current detection in the servo drive is affected by an external interference source.
Checking method and corrective action	Check the environment around the servo drive to see if there is any interference source.
How to clear the alarm?	1. Remove the interference source or move the servo drive away from the interference source. 2. Set P2.112 [Bit 1] to 0 to disable AL089. 3. If the issue persists, send your servo drive back to the distributor or contact Delta.

AL08A Auto tuning function - command error	
Trigger condition and cause	Condition: no command is issued within 15 seconds after the servo drive starts the auto tuning procedure. Cause: 1. When the command source is the controller, neither the controller nor the position register issued the command. 2. When the command source is the servo drive, Position 1 and Position 2 specify the same position. 3. The signal cable is not connected or incorrectly connected so that the servo drive cannot receive the command.
Checking method and corrective action	1. Make sure a command is being issued. 2. Set Position 1 and Position 2 again. 3. Make sure the wiring between the controller and servo drive is correct.
How to clear the alarm?	DI.ARST

AL08B Auto tuning function - dwell time is too short	
Trigger condition and cause	Condition: the dwell time is too short when the command source is the controller in the auto tuning procedure. The auto tuning algorithm requires a certain amount of time to perform the calculation. The tuning result is affected if the dwell time is too short. Cause: dwell time in the cycle is too short.
Checking method and corrective action	1. For a reciprocating motion between two points, pausing is required on the return, which has to be longer than 1 second. 2. For rotation in a single direction, pause time is required when the motor rotates a certain number of cycles (> 2 cycles).
How to clear the alarm?	DI.ARST

AL08C Auto tuning function - inertia estimation error	
Trigger condition and cause	Condition: inertia estimation error occurs when the servo drive starts the auto tuning procedure. Cause: 1. Acceleration or deceleration time is too long. 2. Rotation speed is too slow. 3. Load inertia of the machine is too large. 4. Variation of the machine inertia is too drastic.
Checking method and corrective action	1. The time for the motor to accelerate from 0 rpm to 3,000 rpm or decelerate from 3,000 rpm to 0 rpm must be within 1.5 seconds. 2. The lowest speed should be no less than 200 rpm. It is suggested that you set the speed to 500 rpm or higher. 3. The load inertia should be less than 50 times the motor inertia. 4. Avoid applications that require drastic variation in the inertia.
How to clear the alarm?	DI.ARST

AL099 DSP firmware error	
Trigger condition and cause	EEPROM is not reset after DSP firmware is updated.
Checking method and corrective action	Check if the firmware is updated. If so, set P2.008 to 30 and then 28. Cycle power on the servo drive. Contact Delta if this error persists.
How to clear the alarm?	Set P2.008 to 30 and then 28. Cycle power on the servo drive.

AL09C Parameter reset failed	
Trigger condition and cause	Condition: the parameter reset process is not complete. Cause: an error occurred during the parameter reset process, so the reset procedure could not be completed.
Checking method and corrective action	Check if the power is cut off during the reset process. Check the power wiring and switch.
How to clear the alarm?	Set P2.008 to 30 and then 28. Cycle power on the servo drive.

AL09F Capacitor charging error	
Trigger condition and cause	Condition: the charging time of the capacitor exceeds the normal range. Cause: 1. The input voltage of the main circuit is lower than the allowable rated value or the current is too low. 2. Incorrect setting value of P4.024 (Level of undervoltage error). 3. IGBT error.
Checking method and corrective action	1. Check if the voltage wiring is correct and the wiring of input voltage for the main circuit is normal. 2. Check the switch of the power supply and use a voltmeter to check the main circuit voltage. 3. Use a voltmeter to check if the power system complies with the specifications. If not, use the correct power source or connect the transformer in series. 4. Check the wiring of the external regenerative resistor. 5. Send your servo drive back to distributors or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL0A6 Absolute positions of the servo drive and motor do not match	
Trigger condition and cause	Condition: suppose there are servo drive A, servo motor A, servo drive B, and servo motor B. Servo drive A and servo drive B have established the absolute origin coordinates with servo motor A and servo motor B respectively. In this case, if you operate servo drive A with servo motor B, AL0A6 will be triggered. Cause: replace the servo drive or servo motor.
Checking method and corrective action	Re-establish the absolute origin positions.
How to clear the alarm?	Re-establish the absolute origin positions.

14

AL111 Buffer overflow occurs when SDO is received	
Trigger condition and cause	SDO Rx Buffer overflows (the servo drive receives more than two SDOs within 1 ms).
Checking method and corrective action	Check if the servo drive or the master receives or sends more than one SDO within 1 ms.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL112 Buffer overflow occurs when PDO is received	
Trigger condition and cause	PDO Rx Buffer overflows (the servo drive receives more than two PDOs of COB-ID within 1 ms).
Checking method and corrective action	Check if the servo drive or the master receives or sends more than one PDO of the same COB-ID within 1 ms.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL113 TxPDO transmission failed	
Trigger condition and cause	PDO packet cannot be successfully sent.
Checking method and corrective action	Check if the communication circuit of the servo drive works normally.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL121 Object's index does not exist when PDO is accessed	
Trigger condition and cause	When the servo drive receives the PDO from the controller, the specified object's index number is incorrect, so the servo drive cannot identify it.
Checking method and corrective action	1. Check if the object's index number for PDO mapping of the controller is correct. 2. If the index number is correct, it means this specified object is not supported by the servo drive. Check if it is necessary to use this object or if you can substitute it with a different object.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL122 Object's sub-index does not exist when PDO is accessed	
Trigger condition and cause	When the servo drive receives the PDO from the controller, the specified object's sub-index number is incorrect, so the servo drive cannot identify it.
Checking method and corrective action	1. Check if the object's sub-index number for PDO mapping of the controller is correct. 2. If the sub-index number is correct, it means this specified object is not supported by the servo drive. Check if it is necessary to use this object or if you can substitute it with a different object.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL123 Data length error occurs when PDO is accessed	
Trigger condition and cause	Data length in the message does not match the length of the specified object.
Checking method and corrective action	Check if the data length of PDO mapping entry is changed when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL124 Data range error occurs when PDO is accessed	
Trigger condition and cause	The data value in the message exceeds the range of the specified object.
Checking method and corrective action	Check if the written data is within range when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL125 PDO object is read-only and write-protected	
Trigger condition and cause	The specified object in the message is read-only and write-protected.
Checking method and corrective action	Check if the object for PDO mapping is read-only.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL126 Specified object does not support PDO mapping	
Trigger condition and cause	The specified object does not support PDO mapping.
Checking method and corrective action	Check if the specified object supports PDO mapping when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL127 PDO object is write-protected when servo drive is on	
Trigger condition and cause	PDO object is write-protected (unchangeable) when the servo drive is on.
Checking method and corrective action	Make sure no specified object is written when the servo drive receives or sends the PDO in the Servo On state.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL128 Error occurs when PDO object is read from EEPROM	
Trigger condition and cause	An error occurs when the default value is loaded from ROM at start-up. All objects are automatically restored to default values.
Checking method and corrective action	Check if an error occurs because the specified object is read from EEPROM when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL129 Error occurs when PDO object is written to EEPROM	
Trigger condition and cause	An error occurs when the PDO object is written to EEPROM.
Checking method and corrective action	Check if an error occurs because the specified object is written to EEPROM when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL130 Accessing address of EEPROM is out of range	
Trigger condition and cause	The amount of data in the ROM is greater than the allowable space specified by the firmware. It is probably because the firmware has been updated, but the data in the ROM was stored by the previous firmware version.
Checking method and corrective action	Check if the specified object causes the accessing address in EEPROM exceeds the range when the servo drive receives or sends the PDO.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL131 EEPROM CRC calculation error	
Trigger condition and cause	The data in ROM is damaged. All objects are automatically restored to default values.
Checking method and corrective action	Check if the specified object causes a CRC calculation error in EEPROM when the servo drive receives or sends the PDO. Usually, this alarm is caused by an error in DSP.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL132 Parameter is write-protected	
Trigger condition and cause	When data is written to the parameter using bus communication, the parameter is currently write-protected.
Checking method and corrective action	Refer to the corresponding parameter description to write data to the parameter.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL170 Bus communication timeout	
Trigger condition and cause	The servo drive does not receive any PDO data within the set communication cycle time.
Checking method and corrective action	1. Check if the communication is normal. 2. Check if the wiring is correctly connected.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL180 Bus communication timeout	
Trigger condition and cause	The servo drive does not receive any PDO data within the set communication cycle time.
Checking method and corrective action	1. Check if the communication is normal. 2. Check if the wiring is correctly connected.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL185 Bus hardware error	
Trigger condition and cause	Condition: bus communication is cut off. Cause: abnormal communication hardware.
Checking method and corrective action	1. Check if the communication cable is intact and firmly connected. 2. Check the communication quality; it is suggested that you use common grounding and shielded cable. 3. For communication type models, check if the value of monitoring variable 120 increases continuously.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL186 Bus data transmission error	
Trigger condition and cause	Bus data transmission error.
Checking method and corrective action	1. Check if the communication cable is properly connected and whether there is any noise interference. Replace the communication cable or eliminate the noise if necessary. 2. There are an excessive number of slave stations and the communication cycle time is too short. Lengthen the communication cycle.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL201 Initialization error of object dictionary data	
Trigger condition and cause	Condition: an error has occurred when the servo drive loads data from EEPROM. Cause: initialization error of CANopen data.
Checking method and corrective action	1. If the alarm is cleared after power cycling of the servo drive, it means the error occurred at the moment when the servo drive reads the data. 2. If the issue persists after power cycling of the servo drive, it means the data in the EEPROM is damaged and you need to write the correct values again. See the following methods: (a) To write the default value, set P2.008 to 30 and then 28, or use the CANopen object OD 1011h to complete the setting. (b) To write the current value, set the CANopen object OD 1010h. 3. If you took the corrective actions but the issue persists, it means the data array is incorrect. Set P2.008 to 10 to reset the parameters.
How to clear the alarm?	0x6040 fault reset, DI.ARST, or 0x1011.

AL207 Parameter group of Type [8] PR is out of range	
Trigger condition and cause	Condition: when Type [8] PR command specifies Parameter as the data source, the parameter group is out of range. Cause: parameter group exceeds the range.
Checking method and corrective action	Write parameter using PR procedure: when the data source is Parameter and the group setting exceeds the range, check the setting range of the group for the written parameters.
How to clear the alarm?	DI.ARST

AL209 Parameter number of Type [8] PR is out of range	
Trigger condition and cause	Condition: when Type [8] PR command specifies Parameter as the data source, the parameter number is out of range. Cause: parameter number exceeds the range.
Checking method and corrective action	Write parameter using PR procedure: when the data source is Parameter and the parameter number setting exceeds the range, check the setting range of the number for the written parameters.
How to clear the alarm?	DI.ARST

AL211 Parameter format setting of Type [8] PR is in error	
Trigger condition and cause	Condition: parameter format setting of Type [8] PR command is in error. Cause: 1. Incorrect parameter format. 2. The ASDA-Soft software version and the firmware version are not compatible.
Checking method and corrective action	1. Check if the parameter format is correct. 2. Check if you are using the latest version of the ASDA-Soft software. If you took the corrective actions but the issue persists, contact the local distributor or technician.
How to clear the alarm?	DI.ARST

AL213 Parameter setting of Type [8] PR is in error	
Trigger condition and cause	Condition: when you use Type [8] PR command to write the parameter, the parameter value is incorrect. Cause: an error occurs when you write the parameter with Type [8] PR command.
Checking method and corrective action	Make sure the parameter value is within the correct range.
How to clear the alarm?	DI.ARST

AL215 Parameter written by Type [8] PR is read-only	
Trigger condition and cause	Condition: the read-only parameter is written by Type [8] PR command. Cause: an error occurs when you write the parameter with Type [8] PR command.
Checking method and corrective action	The specified parameter is read-only.
How to clear the alarm?	DI.ARST

AL217 Parameter written by Type [8] PR is write-protected when Servo On	
Trigger condition and cause	Condition: when you use Type [8] PR command to write the parameter, the parameter is write-protected when the servo drive is On or the parameter value exceeds the range. Cause: an error occurs when you write the parameter with Type [8] PR command.
Checking method and corrective action	Write the parameters when the servo drive is Off and make sure the parameter value is within the range.
How to clear the alarm?	Modify the PR command and the parameter.

AL219 Parameter written by Type [8] PR is write-protected	
Trigger condition and cause	Condition: the parameter written by Type [8] PR command is write-protected. Cause: the parameter write-protected function is enabled.
Checking method and corrective action	Check if the parameter and data array protection function (P5.097) is enabled.
How to clear the alarm?	Disable the parameter and data array protection function or reset the parameters.

AL231 Monitoring variable code specified by Type [8] PR is out of range	
Trigger condition and cause	Condition: when Type [8] PR command specifies Monitoring variable as the data source, the monitoring variable code is out of range. Cause: the monitoring variable code is out of range.
Checking method and corrective action	Write parameter using PR procedure: when the data source is Monitoring variable and the code exceeds the range, check the setting range of the code for the monitoring variable.
How to clear the alarm?	DI.ARST

AL235 Position counter overflow warning	
Trigger condition and cause	Condition: a positioning command is executed after the overflow of the position command counter. Cause: overflow of the position command counter.
Checking method and corrective action	Incremental system: When the motor keeps operating in one direction, this leads to overflow of the position feedback register (FB_PUU), and the position system cannot display the correct position. Executing a positioning command after overflow results in this error. Use the scope to check if the feedback position has overflowed and then execute the homing procedure. Absolute system: This error occurs when the absolute positioning command is issued in the following conditions: 1. Feedback position register (FB_PUU) overflows. 2. Absolute origin position is not established after the setting of P1.001.Z is changed. 3. Absolute origin position is not established after the E-Gear ratio (P1.044 and P1.045) is changed. 4. The absolute origin position is established, but the homing procedure is incomplete. 5. When AL060 and AL062 occur, use the scope to check if the feedback position has overflowed. Check whether the preceding conditions have occurred and then establish the absolute origin position.
How to clear the alarm?	Incremental system: perform homing procedure after using DI.ARST to clear the alarm. Absolute system: establish the absolute origin position.

AL237 Rotary axis position is undefined	
Trigger condition and cause	The starting point of the rotary axis position is not defined before you operate the rotary axis position control and execute the rotary axis positioning command. This alarm occurs because the servo drive cannot identify the rotary axis position system.
Checking method and corrective action	Check if the rotary axis position is undefined: perform the homing procedure before using the rotary axis position control to avoid triggering this alarm.
How to clear the alarm?	DI.ARST

AL245 PR positioning timeout	
Trigger condition and cause	Condition: PR positioning function is triggered. Cause: the time for executing positioning is too long.
Checking method and corrective action	Check if the conditions for completing the PR commands are not set or not triggered causing the PR command incomplete.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL249 PR path number is out of range	
Trigger condition and cause	Condition: the number of the triggered PR path exceeds the upper limit. Cause: the number of the triggered PR path exceeds 99.
Checking method and corrective action	1. Check if the PR command jumps to a path exceeding the range. 2. Check if the PR command format is correct.
How to clear the alarm?	DI.ARST or cycle power on the servo drive.

AL283 Software positive limit	
Trigger condition and cause	Condition: the feedback position exceeds the software positive limit. Cause: the software positive limit is triggered.
Checking method and corrective action	Software positive limit triggering is determined by the feedback position. Set an appropriate deceleration time to achieve the desired effect. For more information, refer to the description of P5.003.
How to clear the alarm?	The alarm is automatically cleared after the motor moves away from the limit.

AL285 Software negative limit	
Trigger condition and cause	Condition: the feedback position exceeds the software negative limit. Cause: the software negative limit is triggered.
Checking method and corrective action	Software negative limit triggering is determined by the feedback position. Set an appropriate deceleration time to achieve the desired effect. For more information, refer to the description of P5.003.
How to clear the alarm?	The alarm is automatically cleared after the motor moves away from the limit.

AL289 Position counter overflows	
Trigger condition and cause	Position counter overflows.
Checking method and corrective action	1. Set the gear ratio according to the actual application requirements and the total traveling distance of the absolute motor to avoid overflow of the feedback counter. 2. If P2.069.Z is set to 1 (enabling the function of preventing the rotary axis position from being lost when overflow occurs), set P2.070 [Bit 2] to 1 (no overflow warning).
How to clear the alarm?	DI.ARST

AL301 CANopen synchronization failure	
Trigger condition and cause	Condition: the synchronization with the controller fails when you use the CANopen IP mode (B mode). Cause: communication fails to synchronize.
Checking method and corrective action	1. Make sure the communication between the servo drive and controller is good. 2. After eliminating any problems that you find, allow the controller to re-send the synchronization signal and ensure that it is sent successfully. 3. Modify the setting for P3.009 (the default value is suggested).
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL302 Synchronization signal of CANopen is sent too soon	
Trigger condition and cause	Condition: the synchronization signal is received too early when you use the CANopen IP mode (B mode). Cause: the synchronization signal of CANopen is sent too soon.
Checking method and corrective action	1. Make sure the setting of communication cycle period (OD 1006h) is identical to that of the controller. 2. Modify the synchronization error range setting (P3.009.U). (For -M and -F models.) 3. Ensure the correct time sequence of sending packets from the controller. A drift or delay in packet sending time causes synchronization failure.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL303 CANopen synchronization signal timeout	
Trigger condition and cause	Condition: the synchronization with the controller fails when you use the CANopen IP mode (B mode). Cause: timeout of CANopen synchronization signal.
Checking method and corrective action	1. Make sure the communication between the servo drive and controller is good. 2. Make sure the setting of communication cycle period (OD 1006h) is identical to that of the controller. 3. Modify the synchronization error range setting (P3.009.U). (For -M and -F models.) 4. Ensure the correct time sequence of sending packets from the controller. A drift or delay in packet sending time causes synchronization failure. 5. When the servo drive is in the operation mode of PV (Profile velocity mode), PT (Profile torque mode), or HM (Homing mode), check if P3.017 is set too low.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL304 Invalid interpolation mode command	
Trigger condition and cause	Condition: the servo drive cannot send the command when in IP mode (except the CANopen B mode). Cause: the interpolation command fails.
Checking method and corrective action	The computing time takes too long. Disable the USB monitoring function.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL305 SYNC period error	
Trigger condition and cause	Condition: CANopen 301 OD 1006h Data Error. Cause: SYNC period is in error.
Checking method and corrective action	Check the value of OD 1006h. If it is smaller than or equal to 0, this alarm occurs.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL35F Emergency stop during deceleration	
Trigger condition and cause	This alarm occurs when DI.PFQS (0x47) is rising-edge triggered. Then the motor decelerates to 0 and triggers AL3CF.
Checking method and corrective action	Check if the DI is set to 0x47 with any of the parameters, P2.010 - P2.017 and P2.036 - P2.040, and is triggered.
How to clear the alarm?	Cycle power on the servo drive.

AL380 Position offset alarm for DO.MC_OK	
Trigger condition and cause	DO.MC_OK is on and then goes off.
Checking method and corrective action	Refer to the description of P1.048. After DO.MC_OK is on, DO.MC_OK then goes off because DO.TPOS turns off. There might be an external force causing the position offset of the motor after positioning is complete. Disable this alarm by setting P1.048.Y to 0.
How to clear the alarm?	DI.ARST

AL3CF Emergency stop	
Trigger condition and cause	After AL35F is triggered and the motor has decelerated to 0, this alarm occurs.
Checking method and corrective action	Check if the DI is set to 0x47 with any of the parameters, P2.010 - P2.017 and P2.036 - P2.040, and is triggered.
How to clear the alarm?	DI.ARST

AL3E1 Communication fails to synchronize	
Trigger condition and cause	Condition: the communication synchronization with the controller fails in IP mode (except the CANopen B mode). Cause: communication fails to synchronize.
Checking method and corrective action	1. Make sure the communication between the servo drive and controller is good. 2. After eliminating any problems that you find, allow the controller to re-send the synchronization signal and ensure that it is sent successfully. 3. Modify the setting for P3.009 (the default value is suggested).
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL3E2 Communication synchronization signal is sent too soon	
Trigger condition and cause	Condition: the synchronization signal is received too early. Cause: the communication synchronization signal is sent too soon.
Checking method and corrective action	1. Make sure the setting of communication cycle period (OD 1006h) is identical to that of the controller. 2. Modify the synchronization error range setting (P3.009.U). (For -M and -F models.) 3. Ensure the correct time sequence of sending packets from the controller. A drift or delay in packet sending time causes synchronization failure.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL3E3 Communication synchronization signal timeout	
Trigger condition and cause	The target command is not received within a continuous communication cycle in IP mode (except the CANopen B mode).
Checking method and corrective action	1. Make sure the communication between the servo drive and controller is good. 2. Make sure the setting of communication cycle period (OD 1006h) is identical to that of the controller. 3. Modify the synchronization error range setting (P3.009.U). (For -M and -F models.) 4. Modify the setting of IP command timeout (P3.022.YX). (For -E models.) 5. Ensure the correct time sequence of sending packets from the controller. A drift or delay in packet sending time causes synchronization failure.
How to clear the alarm?	NMT: reset node or OD 6040h [Bit 7] (Fault reset).

AL3F1 Absolute position command of the communication type servo drive is in error	
Trigger condition and cause	Condition: when the bus communication type servo drive is used with an incremental motor and the position overflow occurs with the absolute origin position not established, the absolute positioning command is issued. Cause: 1. The absolute origin position is not established. 2. Overflow occurs since the motor keeps rotating in the same direction.
Checking method and corrective action	Establish the absolute origin position.
How to clear the alarm?	Establish the absolute origin position.

AL400 Rotary axis position setting error	
Trigger condition and cause	Condition: the position offset of the motor in 1 ms exceeds the setting of P2.052 (Rotary axis position scale). Cause: the value of P2.052 is set too small.
Checking method and corrective action	Check if P2.052 is set according to the specifications in the manual.
How to clear the alarm?	DI.ARST

AL401 NMT reset command is received when servo is on	
Trigger condition and cause	NMT reset command is received when the servo is on.
Checking method and corrective action	Check if the NMT reset command is received when the servo is on.
How to clear the alarm?	NMT: reset node, OD 6040h [Bit 7] (Fault reset), or DI.ARST.

AL404 PR special filter setting value is too great	
Trigger condition and cause	The value of the PR command special filter (P1.022) is set too great, causing the following error of the internal position to exceed the allowable range.
Checking method and corrective action	Check the setting of P1.022. If the value is too great, the following error exceeds the allowable range in a short time. Adjust the value of P1.022.
How to clear the alarm?	DI.ARST

AL422 Write-in failed caused by power supply cut-off	
Trigger condition and cause	Condition: if P2.069.Z is set to 1 (enabling the function of preventing the rotary axis position from being lost when overflow occurs) and the power supply is cut off, the motor fails to store the current position. Cause: 1. The load is over the rated range and the servo drive is in a continuous overload condition. 2. After firmware update, the internal variables vary from versions. 3. The servo drive hardware EEPROM is abnormal. 4. The hardware of the servo drive is short-circuited. 5. AL520 occurred and causes malfunction of the servo drive.
Checking method and corrective action	1. Monitor if the average load rate [%] is continuously over 100% by setting P0.002 to 12. If so, increase the motor capacity or reduce the load. Refer to Appendix A for Graph of load and operating time. 2. If the issue persists, send your servo drive back to the distributor or contact Delta.
How to clear the alarm?	Cycle power on the servo drive.

AL500 STO function is enabled	
Trigger condition and cause	Safe torque off function (STO) is activated.
Checking method and corrective action	Safe torque off function (STO) is activated. Check why it is activated.
How to clear the alarm?	1. Reset by using DI.ARST (Alarm reset), OD 6040h [Bit 7] (Fault reset), or setting P0.001 to 0. 2. If not using the STO function, plug the short circuit connector into CN10 or wire to short-circuit the CN10 STO connector. Follow the instructions in Chapter 3 for the STO wiring.

AL501 SF1 lost (signal loss or signal error)	
Trigger condition and cause	Loss of SF1 signal, or SF1 and SF2 signals are not synchronized for more than 1 second.
Checking method and corrective action	Make sure the wiring of SF1 is correct.
How to clear the alarm?	Cycle power on the servo drive.

AL502 SF2 lost (signal loss or signal error)	
Trigger condition and cause	Loss of SF2 signal, or SF1 and SF2 signals are not synchronized for more than 1 second.
Checking method and corrective action	Make sure the wiring of SF2 is correct.
How to clear the alarm?	Cycle power on the servo drive.

AL503 STO self-diagnostic error	
Trigger condition and cause	An error occurs during STO self-diagnosis, which may be caused by an abnormality in the STO circuit.
Checking method and corrective action	N/A
How to clear the alarm?	Contact the distributor.

AL510 Internal parameter update program of the servo drive is abnormal	
Trigger condition and cause	Internal parameter update program of the servo drive is abnormal.
Checking method and corrective action	Cycle power on the servo drive and re-execute the operation which is prior to the occurrence of this alarm.
How to clear the alarm?	Cycle power on the servo drive.

AL520 Calculation program timeout	
Trigger condition and cause	Servo drive calculation program timeout.
Checking method and corrective action	1. Cycle power on the servo drive. 2. If the alarm persists, disable the vibration elimination function by setting [Bit 8] and [Bit 9] of P2.094 to 0.
How to clear the alarm?	N/A

AL521 Vibration elimination parameter error	
Trigger condition and cause	Condition: the input value for the vibration elimination parameter is not appropriate. Cause: 1. Your input value for the vibration elimination parameter is not appropriate. 2. The Bode plot is in error due to other factors when the System Analysis tool of ASDA-Soft is in operation.
Checking method and corrective action	Perform system analysis again and correctly set the value for the vibration elimination parameter.
How to clear the alarm?	1. Perform system analysis again and correctly set the value for the vibration elimination parameter. 2. If the issue persists, disable the vibration elimination function by setting [Bit 8] and [Bit 9] of P2.094 to 0.

AL555 System failure	
Trigger condition and cause	Servo drive DSP is in error.
Checking method and corrective action	If this alarm occurs, send your servo drive directly back to Delta without making any modification.
How to clear the alarm?	N/A

AL809 PR motion setting error or command decoding error	
Trigger condition and cause	Condition: an error occurs when the servo drive decodes the motion command. Cause: incorrect motion command or abnormal software compiling may cause error in the PR program.
Checking method and corrective action	1. If this alarm occurs when the servo is not in the PR mode, save the parameter file and provide it to the distributor. 2. For advanced users: save the scope screenshot when the alarm occurs. Set P5.007 and P0.001 for the two channels and save the oscillogram.
How to clear the alarm?	Cycle power on the servo drive.

ALC31 Motor power cable disconnection	
Trigger condition and cause	Condition: disconnection of the motor power cable (U, V, W) and ground (GND). Cause: disconnection of the motor power cable (U, V, W) and ground (GND). The switch for disconnection detection is set by P2.065 [Bit 9], which is enabled by default.
Checking method and corrective action	Check if the motor power cable (U, V, W) and ground (GND) are firmly connected. Follow the instructions in this user manual to properly connect the motor power cable and ground wire.
How to clear the alarm?	Cycle power on the servo drive.

ALCDB Servo drive model type error	
Trigger condition and cause	Servo drive model type error.
Checking method and corrective action	1. Update the firmware again. 2. If the issue persists after the firmware is updated, send your servo drive back to Delta.
How to clear the alarm?	Cycle power on the servo drive.