MAINTENANCE AND TROUBLESHOOTING



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CHAPTER

MAINTENANCE AND INSPECTIONS

Modern AC drives are based on solid state electronics technology, including ICs, resistors, capacitors, transistors, cooling fans, relays, etc. These components have a limited life under normal operation. Preventive maintenance is required to operate the GS20(X) drive in its optimal condition, and to ensure a long life. We recommend that a qualified technician perform a regular inspection of the GS20(X) drive. Some items should be checked once a month, and some items should be checked yearly.



NOTE: All inspections should be accomplished with Safety in mind with due and required caution. Some of these Inspection items may require the Drive to be powered down, while others may require power to be applied. Proper safety precautions including the use of PPE are/may be required. Please review cautionary statements in each section

MONTHLY INSPECTION

Check the following items at least once a month.

- 1) Make sure the motors are operating as expected.
- 2) Make sure the drive installation environment is normal.
- 3) Make sure the enclosure and drive cooling systems are operating as expected.
- 4) Check for irregular vibrations or sounds during operation.
- 5) Make sure the motors are not overheating during operation.
- 6) Check the input voltage to the GS20(X) drive and make sure the voltage is within the operating range. Check the voltage with a voltmeter.

ANNUAL INSPECTION

Check the following items once annually.

- 1) Check the torque of the GS20(X) power and control terminal screws and tighten if necessary. They may loosen due to vibration or changing temperatures.
- 2) Make sure the conductors and insulators are not corroded or damaged.
- 3) Check the resistance of cable insulation with a megohmmeter.
- 4) Clean off any dust and dirt with a vacuum cleaner. Pay special attention to cleaning the ventilation ports and PCBs. Always keep these areas clean. Accumulation of dust and dirt in these areas can cause unforeseen failures.
- 5) Recharge the capacitors of any drive that is in storage or is otherwise unused.

RECHARGE CAPACITORS (FOR DRIVES NOT IN SERVICE)

Recharge the DC link before using any drive that has not been operated within a year:

- 1) Disconnect the motor from the drive.
- 2) Apply input power to the drive for 2 hours.



If the drive is stored or is otherwise unused for more than a year, the drive's internal DC link capacitors should be recharged before use. Otherwise, the capacitors may be damaged when the drive starts to operate. We recommend recharging the capacitors of any unused drive at least once per year.



DISCONNECT AC POWER AND ENSURE THAT THE INTERNAL CAPACITORS HAVE FULLY DISCHARGED BEFORE INSPECTING THE GS20(X) DRIVE! WAIT AT LEAST FIVE MINUTES AFTER ALL DISPLAY LAMPS HAVE TURNED OFF.

- ☑ Wait 5 seconds after a fault has been cleared before performing reset via keypad or input terminal.
- When the power is off after 5 minutes for ≤ 30hp models and 10 minutes for ≥ 40hp models, please confirm that the capacitors have fully discharged by measuring the voltage between + and -. The voltage between + and should be less than 25VDC.



- Only qualified personnel can install, wire and maintain drives.
 Please take off any metal objects, such as watches and rings, before operation. And only insulated tools are allowed.
- \square Never reassemble internal components or wiring.
- ☑ Make sure that installation environment complies with regulations without abnormal noise, vibration and smell.

Recommended Inspection Schedules

Before the check-up, always turn off the AC input power and remove the cover. Wait at least 10 minutes after all display lamps have gone out, and then confirm that the capacitors have fully discharged by measuring the voltage between DC+ and DC-. The voltage between DC+ and DC-should be less than 25VDC.

Ambient environment

| | | | Maintenance Period | | | |
|---|--|-------|---------------------------|-------------|--|--|
| Check Items | Methods and Criteria | Daily | Half Year | One Year | | |
| Check the ambient temperature, humidity, vibration and see if there are any dust, gas, oil or water drops | Visual inspection and measurement with equipment with standard specification | 0 | | | | |
| If there are any dangerous objects | Visual inspection | 0 | | | | |

Voltage

| | | Maintenance Period | | |
|---|---|--------------------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| Check if the voltage of main circuit and control circuit is correct | Measure with multimeter with standard specification | 0 | | |

Digital Keypad Display

| | | Maintenance Period | | | |
|----------------------------------|----------------------|--------------------|--------------|-------------|--|
| Check Items | Methods and Criteria | Daily | Half Year | One Year | |
| Is the display clear for reading | Visual inspection | \bigcirc | | | |
| Any missing characters | Visual inspection | \bigcirc | | | |

Mechanical parts

| | | Mainte | enance | Period |
|---|-------------------------------|--------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there is any abnormal sound or vibration | Visual and audible inspection | | \bigcirc | |
| If there are any loose screws | Tighten the screws | | \bigcirc | |
| If any part is deformed or damaged | Visual inspection | | \bigcirc | |
| If there is any color change due to overheating | Visual inspection | | 0 | |
| If there is any dust or dirt | Visual inspection | | \bigcirc | |

Recommended Inspection Schedules (continued)

Main circuit

| | | Mainte | Period | |
|---|---|------------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there are any loose or missing screws | Tighten or replace the screw | \bigcirc | | |
| If any drive or wiring insulation is deformed, cracked, damaged or has changed color due to overheating or aging | Visual inspection NOTE: Ignore any color change of copper plate | | \bigcirc | |
| If there is any dust or dirt | Visual inspection | | \bigcirc | |

Terminals and wiring of main circuit

| Check Items | Methods and Criteria | Maintenance Period | | | |
|---|----------------------|--------------------|--------------|-------------|--|
| | | Daily | Half Year | One Year | |
| If the terminal color or the placement has changed due to overheating | Visual inspection | | \bigcirc | | |
| If the wiring insulation is damaged or there has been a color change | Visual inspection | | 0 | | |
| If there is any damage | Visual inspection | \bigcirc | | | |

DC capacity of main circuit

| Check Items | Methods and Criteria | Maintenance Period | | | |
|---|---|---------------------------|--------------|-------------|--|
| | | Daily | Half Year | One Year | |
| If there is any liquid leaking, color change, crack or deformation | Visual inspection | 0 | | | |
| If the capacitor safety vent is bulging or inflated. | Visual inspection | 0 | | | |
| Measure static capacity when required (if drive overloads/faults during normal operation) | Measure with multimeter with standard specification | 0 | | | |

Recommended Inspection Schedules (continued)

Resistor of main circuit

| Check Items | Methods and Criteria | Maintenance Period | | | |
|--|--|--------------------|--------------|-------------|--|
| | | Daily | Half Year | One Year | |
| If there is any peculiar smell or insulation cracks due to overheating | Visual inspection, smell | 0 | | | |
| If there is any disconnection or discoloration | Visual inspection | 0 | | | |
| If the connection is damaged | Measure with a multimeter with standard specifications | 0 | | | |

Transformer and reactor of main circuit

| | | Maintenance Period | | |
|--|--------------------------------------|--------------------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there is any abnormal vibration or peculiar smell | Visual, audible inspection and smell | 0 | | |

Magnetic contactor and relay of main circuit

| | | Maintenance Period | | | |
|--------------------------------|-------------------------------|--------------------|--------------|-------------|--|
| Check Items | Methods and Criteria | Daily | Half Year | One Year | |
| If there are any loose screws | Visual and audible inspection | \bigcirc | | | |
| If the contact works correctly | Visual inspection | \bigcirc | | | |

Printed circuit board and connector of main circuit

| | | Mainte | enance | Period |
|---|---|--------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there are any loose screws and connectors | Tighten the screws and press the connectors firmly in place | | \bigcirc | |
| If there is any peculiar smell and/or color change | Visual and smell inspection | | \bigcirc | |
| If there is any crack, damage, deformation or corrosion | Visual inspection | | \bigcirc | |
| If there is any liquid leakage or deformation in capacity | Visual inspection | | \bigcirc | |

Recommended Inspection Schedules (continued)

Cooling fan of cooling system

| | | Mainte | Period | |
|---|--|--------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there is any abnormal sound or vibration | Visual, audible inspection and turn the fan with hand (turn off the power before operation) to see if it rotates smoothly | | \bigcirc | |
| If there is any loose screw | Tighten the screw | | \bigcirc | |
| If there is any color change due to overheating | Change the fan | | \bigcirc | |

Ventilation channel of cooling system

| | | Maintenance Peri | | |
|--|----------------------|------------------|--------------|-------------|
| Check Items | Methods and Criteria | Daily | Half Year | One Year |
| If there is any obstruction in the heat sink, air intake or air outlet | Visual inspection | | \bigcirc | |

Please use a clean lint free cloth for cleaning and use a dust cleaner to remove dust when necessary.

TROUBLESHOOTING

WARNING CODES

The GS20(X) drive has a comprehensive diagnostic system that includes several different warning codes. The most common warning codes can be read on the digital keypad display.

For communication errors, "Upper unit" is referring to the Master controller of the serial network. Always ensure the communication settings of the drive (P09.01 and P09.04) match those of the master controller and network.



| | | 1 | W | arning Codes | | |
|---------------------------------|--------|---|---|--|-----|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Co | prrective Action |
| n/a | 0 | No error | n/a | n/a | n/a | |
| | | | Action Level | When the function code is 03, 06, 10, and 63 | 1) | Check if the communication command is correct Verify the wiring and grounding of |
| | | Communication error | Action Time Warning setting parameter | Immediately act | 2) | the communication circuit. Separate the communication circuit from the |
| EE I | 1 | 1 (CE1) RS-485 Modbus illegal function code. | Reset method | "Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct function code. | 3) | main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper |
| | | | Reset condition | Immediately reset | 1 | unit. |
| | | | Record | N/A | 4) | Check the cable and replace it if necessary. |
| | | Communication error 2 (CE2) RS-485 Modbus illegal data address | Action Level | When the input data address is incorrect | 1) | Check if the communication command is correct. |
| | | | Action Time | Immediately act | 2) | Verify the wiring and grounding of |
| | | | Warning setting parameter | N/A | | the communication circuit. Separate the communication circuit from the |
| CE5 | 2 | | Reset method | "Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct data address. | 3) | main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper |
| | | | Reset condition | Immediately reset |] | unit. |
| | | | Record | N/A | 4) | Check the cable and replace it if necessary. |
| | | | Action Level | When the length of communication data is too long | 1) | Check if the communication command is correct. |
| | | | Action Time | Immediately act | 2) | Verify the wiring and grounding of |
| | | Communication error | Warning setting parameter | N/A | | the communication circuit. Separate the communication circuit from the |
| CE3 | 3 | 3 (CE3) | Reset method | "Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct communication data value. | 3) | main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. |
| | | | Reset condition | Immediately reset | 4) | Check the cable and replace it if |
| | | | Record | N/A | | necessary. |
| | | | (conti | nued next page) | | |

| Warning Codes (continued) Display on | | | | | | | | | |
|--------------------------------------|---------|---|---|--|---|--|--|--|--|
| GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action | | | | |
| | | | Action Level | When the data is written to read-only address | Check if the communication command is correct | | | | |
| | | | Action Time | Immediately act | 2) Verify the wiring and grounding of | | | | |
| | | Communication error | Warning setting parameter | N/A | the communication circuit. Separat | | | | |
| СЕЧ | 4 | 4 (CE4) RS-485 Modbus data is written to read-only address | -485 Modbus data written to read-only dress Reset method the correct v | "Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct written address of communication data. | main circuit, or wire in 90 degree for effective anti-interference performance.3) Check if the setting for P09.04 is th same as the setting for the upper unit. | | | | |
| | | | Reset condition | Immediately reset | 4) Check the cable and replace it if | | | | |
| | | | Record | N/A | necessary. | | | | |
| | | | Action Level | When the communication time exceeds the detection time of P09.03 communication time- out | Check if the upper unit transmits th communication command within th setting time for P09.03. Verify the wiring and grounding | | | | |
| | | | Action Time | P09.03 | of the communication circuit. It | | | | |
| | | Communication error 10 (CE10) | Warning setting parameter | N/A | is recommended to separate the communication circuit from the | | | | |
| CE 10 | IE ID 5 | RS-485 Modbus transmission time-out | Reset method | "Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the next communication packet. | main circuit, or wire in 90 degree for effective anti-interference performance. 3) Check if the setting for P09.04 is the same as the setting for the upper | | | | |
| | | | Reset condition | Immediately reset | unit. | | | | |
| | | | Record | N/A | 4) Check the cable and replace it if | | | | |
| 5E I | 7 | Save error 1 (SE1) Keypad COPY error 1: | Action Level | "SE1" warning occurs when the GS4-KPD optional keypad does not transmit the COPY command to the drive, and does not transmit any data to the drive again in 10 ms at the time you copy the parameters to the drive. | necessary. SE1: The causes of error are mostly communication problems between the keypad and control board. Potential causes include communication signal interference and the unacceptable communication command to the Slave. Check if the error occurs randomly, or only occurs when copying certain | | | | |
| | | Keypad copy time-out | Action Time | 10 ms | parameters (the error displays on the | | | | |
| | | | Warning setting parameter | N/A | upper right corner of the copy page). If you cannot clear the error, please | | | | |
| | | | Reset method | Manual reset (or cycle power) | contact AutomationDirect Technical | | | | |
| | | | Reset condition | Immediately reset | Support. | | | | |
| | | | Record Action Level | N/A "SE2" warning occurs when writing the parameters incorrectly at the time you copy parameters to the drive. For example, you copy the new firmware version with added | Support. SE2: In this stage, the copied data has been transmitted to the Slave. The Slave compares and processes the copied data, and then saves the data to the Data ROM. During the process, the data error (should be attribution error) may occur, or the data cannot be saved | | | | |
| 553 | 0 | Save error 2 (SE2) | | parameters to the drive with | indy occur, or the data carmot be saved | | | | |
| 562 | 8 | Save error 2 (SE2) Keypad COPY error 2: | | old firmware version. | to EEPROM. At this time, the warning | | | | |
| 562 | 8 | | Action Time Warning setting | old firmware version. N/A | | | | | |
| 5E2 | 8 | Keypad COPY error 2: | | old firmware version. | to ÉEPROM. At this time, the warning occurs. | | | | |
| 562 | 8 | Keypad COPY error 2: | Warning setting | old firmware version. N/A | to ÉEPROM. At this time, the warning occurs. Check the status of Data ROM and | | | | |
| 562 | 8 | Keypad COPY error 2: | Warning setting parameter | old firmware version. N/A N/A | to ÉEPROM. At this time, the warning occurs. Check the status of Data ROM and remove the error causes first. | | | | |

| D: / | | | | Codes (continued) | 1 | | | |
|---------------------------------|--------|--|-----------------------------|--|--|---|---|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Co | rrective Action | | |
| | | IGBT over-heating warning (oH1) | Action Level Action Time | P06.15 "oH1" warning occurs when IGBT temperature is higher than P06.15 setting value. | 2) | Check the ambient temperature. Regularly inspect the ventilation ho of the control cabinet. Change the installed location if the | | |
| | | The AC motor drive detects IGBT overheating and | Warning setting parameter | N/A | 4) | are heating objects, such as braking resistors, in the surroundings. Install/add cooling fan or air | | |
| оHl | 9 | exceeds the protection level of oH1 warning. (When P06.15 is higher than the ICPT | Reset method | Auto-reset | 5) | conditioner to lower the temperatu inside the cabinet. Check for and remove obstructions or replace the cooling fan. | | |
| | | higher than the IGBT overheating protection level, the drive shows oH1 error without displaying oH1 warning.) | Reset condition | The drive auto-resets when IGBT temperature is lower than oH1 warning level minus (–) 5°C | 7) 8) | Increase ventilation space of the drive. Decrease loading. Decrease the carrier wave. Replace the drive with higher | | |
| | | 5, | Record | N/A | 1 | capacity model. | | |
| | | PID feedback error (PID) 11 PID feedback loss (warning for analog feedback signal; works only when PID enables) | PID feedback error | Action Level Action Time | When the analog input is lower than 4 mA (only detects analog input 4–20 mA) P08.08 P08.09 setting is: | - | | |
| | | | | | | Warning setting parameter | 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: Warn and operate at last frequency | |
| Pld 11 | 11 | | Reset method | Auto: "Warning" occurs when P08.09=0 or 3. The "Warning" automatically clears when the feedback signal is larger than 4 mA. Manual: "Error" occurs when P08.09=1 or 2. You must reset manually. | 3) | Replace the cable. | | |
| | | | Reset condition | Immediately reset | 1 | | | |
| | | | Record | Records when P08.09=1 or 2 ("Error"). Does not record when P08.09=3 ("Warning"). | - | | | |

| Warning Codes (continued) | | | | | | | | |
|---------------------------------|--|---|---|--|--|---|--|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Co | prrective Action | | |
| | | | Action Level | When the analog input is lower than 4 mA (only detects analog input 4–20 mA) | | | | |
| | | | Action Time | Immediately act P03.19 setting is: 0: Disable | - | | | |
| Ani | 12 | Al2 analog signal loss (AnL) Analog input current | Warning setting parameter | 1: Continue operation at the last frequency (warning, keypad displays ANL) 2: Decelerate to 0 Hz (warning, keypad displays ANL) 3: Stop immediately and display "ACE" | 2) | Check the AI2 wiring and tighten the terminals. Replace the cable. Replace the external device. | | |
| | 12 Analog input current loss (including all analog 4–20 mA signals) | Reset method | Auto: "Warning" occurs when P03.19=1 or 2. The "Warning" automatically clears when the feedback signal is larger than 4 mA. Manual: "Error" occurs when P03.19=3. You must reset manually. | | If the AnL error still occurs after checking all the wiring, contact AutomationDirect Technical Support. | | | |
| | | | Reset condition Record | Immediately reset Does not record when | | | | |
| | | | | P03.19=1 or 2 ("Warning"). | | | | |
| | | | Action Level Action Time | P06.71 P06.72 | | | | |
| | | | Warning setting parameter | P06.73 setting is: 0: No function 1: Fault and coast to stop 2: Fault and ramp to stop by the 2nd deceleration time 3: Warn and continue operation | | Check for a broken motor cable, then | | |
| UC | 13 | Under current (uC) Low current | Reset method | Auto: "Warning" occurs when P06.73=3. The "Warning" automatically clears when the output current is larger than (P06.71+0.1 A). Manual: "Error" occurs when P06.73=1 or 2. You must reset manually. | | exclude the connection issue of the motor and its load. Verify low current protection settings. If needed, set the proper settings for P06.71, P06.72 and P06.73. Check the loading status and make sure the loading matches the motor capacity. | | |
| | | | Reset condition | Immediately reset | | | | |
| | | | Record | Does not record when P06.73=3 and uC displays ("Warning"). | | | | |
| | | | Action Level | The encoder feedback speed > P10.10 | 1) | Verify setting of P10.25. Decrease value if needed. | | |
| | | | Action Time | P10.11 | 2) | Verify bandwidth setting for ASR | | |
| oSPd | 17 | Over speed warning (oSPd) | Warning setting parameter | P10.12=0 0: Warn and continue operation | 3) | speed control and increase the bandwidth setting if needed. Reset motor parameter and run | | |
| סיבט | 17 | Over speed warning | Reset method | "Warning" automatically clears when the drive stops | | parameter tuning. Verify the wiring of the control | | |
| | | | Reset condition | "Warning" automatically clears when the drive stops | | circuit, and the wiring/grounding of the main circuit to prevent | | |
| | | | Record | N/A | | interference. | | |
| | | | (conti | nued next page) | | | | |

| | | | Warning | Codes (continued) | |
|---------------------------------|--------|--|------------------------------|--|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | P10.13 | 1) Verify parameter setting for slip |
| | | | Action Time | P10.14 | error and reset value for P10.13 and |
| | | Deviation Warning | Warning setting parameter | P10.15 Encoder Stall and Slip Error Action =0 0: Warn and continue operation | P10.14 if needed. Reset ASR parameters and set properacel./ decel. time. Verify motor status and remove any causes if the motor is locked. |
| dRuE | 18 | (dAvE) Over speed deviation warning | Reset method | "Warning" automatically clears when the drive stops | Check status of the mechanical brak and verify the action timing of the system if the brake is not released. Verify torque limit and adjust |
| | | | Reset condition | After the drive stops | parameters P06.12 and P11.17-P11.20 as needed.6) Verify the wiring of the control circuit, and the wiring/grounding |
| | | | Record | N/A | of the main circuit to prevent interference. |
| | | | Action Level | One of the phases outputs less than P06.47 | Verify the wiring of the main circuit. Verify a single-phase power input |
| | | | Action Time | P06.46 | is not being used on a three-phase model. Use the model with voltage |
| | | Phase loss | Warning setting parameter | P06.45 Output Phase Loss Detection Action (OPHL) =0 0: Warn and continue operation | that matches the power.3) If the power of main circuit works well, check if the MC of the main circuit is broken. Cycle the |
| PHL | 19 | (PHL) 19 Input phase loss warning | Reset method | "Warning" automatically clears when the drive stops | power after verifying the power is normal. If PHL still occurs, contact AutomationDirect Technical Support 4) Tighten the terminal screws with the |
| | | | Reset condition | After the drive stops | torque listed in the user manual. 5) Verify the input cable is not broken. Make sure the wiring is correct. Replace the broken part of the cable |
| | | | Record | N/A | if needed.6) Verify the three-phase power is not unbalanced. |
| | | | (conti | nued next page) | |

| | | | Warning | Codes (continued) | |
|---------------------------------|------------------|---------------------------------|---|---|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | | Corrective Action |
| | <i>ID No.</i> 20 | | Action and Res Action Level Action Time Warning setting parameter Reset method | P06.07 P06.08 P06.06 Over-torque Detection Selection (Motor 1) =1 or 3 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN When the output current < P06.07, the ot1 warning | Corrective Action 1) Configure the settings for P06.07 and P06.08 again. 2) Check for mechanical error and remove the causes of malfunction. 3) Verify load and decrease the loading or replace with a motor with larger capacity if load is too high. 4) Verify accel/decel time and increase the setting values for P01.12–P01.19 (accel./ decel. time) if work cycle is too short. 5) Verify V/F voltage and adjust the V/F curve (Motor 1, P01.01–P01.08), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). 6) Replace motor with a larger capacity motor. 7) Check for overload during low-speed operation and decrease the loading during low-speed operation or |
| | | | Reset condition Record | automatically clears When the output current < P06.07, the ot1 warning automatically clears N/A | increase the motor capacity. 8) Verify torque compensation and adjust P07.26 torque compensation gain until the output current decreases and the motor does not stall. 9) Correct the parameter settings for speed tracking. Start the speed tracking function. Adjust the maximum current for P07.09 speed tracking. |
| 1 | | | (conti | nued next page) | · |

| | | - | Warning | Codes (continued) | |
|---------------------------------|---------------------|---------------------------------|---|--|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | | Corrective Action |
| | <i>ID No.</i> 21 | | Action and Res Action Level Action Time Warning setting parameter Reset method | P06.10 P06.11 P06.09 Over-torque Detection Selection (Motor 2) = 1 or 3 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN 4: Stop after over-torque detection during RUN When the output current < P06.10, the ot2 warning automatically clears | Corrective Action Configure the settings for P06.10 and P06.11 again. Check for mechanical error and remove the causes of malfunction. Verify load and decrease the loading or replace with a motor with larger capacity if load is too high. Verify accel/decel time and increase the setting values for P01.12–P01.19 (accel./ decel. time) if work cycle is too short. Verify V/F voltage and adjust the V/F curve (Motor 2, P01.35–P01.42), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). Replace motor with a larger capacity motor. Check for overload during low-speed operation and decrease the loading during low-speed operation or increase the motor capacity. |
| | | | Reset condition | When the output current < P06.10, the ot2 warning automatically clears | 8) Verify torque compensation and adjust P07.71 torque compensation gain until the output current decreases and the motor does not stall. 9) Correct the parameter settings for |
| | | | Record | N/A | speed tracking. Start the speed tracking function. Adjust the maximum current for P07.09 speed tracking. |
| | | | (conti | nued next page) | |

| | | | Warning | Codes (continued) | 1 |
|---------------------------------|--------|--|---|---|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | P03.00=6 (PTC), PTC input level > P06.30 PTC level (default=50%) | Check if motor is locked and clear the motor lock status. Verify load and decrease the loading or replace with a motor with larger |
| | | | Action Time | Immediately act | capacity if load is too high. 3) Verify ambient temperature and change the installed location if |
| οНЭ | 22_1 | Motor over-heating (oH3) PTC Motor overheating warning. The AC motor | Warning setting parameter | Error treatment: P06.29 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning When P06.29=0 and when the temperature is ≤ P06.30 level, the oH3 warning automatically clears. When P06.29=0 ("Warning"), it automatically resets. | there are heating devices in the surroundings, or install/add cooling fan or air conditioner to lower the ambient temperature. |
| | | drive detects the temperature inside the motor is too high | Reset method | When P06.29=0, oH3 displays as "Warning". When the temperature is \leq P06.30 level, the oH3 warning automatically clears. | 8) Verify V/F voltage and adjust settings for P01.01–P01.08 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). 9) Verify the motor rated current matches the motor nameplate and |
| | | | Reset condition | When the temperature is \leq P06.30 level, the oH3 warning automatically clears. | configure the correct rated current value of the motor if needed. 10) Check the connection between PTC thermistor and the heat protection. 11) Verify stall prevention setting and set the stall prevention to the proper |
| | | | Record | N/A | value if needed. 12) Check for unbalanced three-phase motor impedance. Replace the motor if needed. 13) Verify harmonics and reduce harmonics if too high. |
| | | Over elip warring (cCl) | Action Level | When the drive outputs at constant speed, and F>H or F <h exceeds="" level<="" p07.29="" td="" the=""><td></td></h> | |
| -51 | 24 | Over slip warning (oSL) Over slip warning. By using the maximum slip (P10.29) as the base, when the drive | Action Time Warning setting parameter | P07.30 P07.31=0 Warning 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop | Check the motor parameter. Verify load and decrease the loading if needed. |
| oSL | 24 | outputs at constant speed, and the F>H or F <h exceeds="" p07.29<br="">level and P.07.30 setting time, 100% P07.29 = P10.29.</h> | Reset method Reset condition | 3: No warning When P07.31=0 and when the drive outputs at constant speed, and F>H or F <h no<br="">longer exceeds the P07.29 level, the oSL warning automatically clears. N/A</h> | Verify the parameter settings for oSL protection (P07.29, P07.30, and P10.29) are correctly set. |
| | | | Record | N/A | |

| D: / | | | vvarning | Codes (continued) | 1 |
|---------------------------------|--------|--|------------------------------|--|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | Auto tuning (tUn) | Action Level | When running P05.00 motor parameter auto-tuning, the keypad displays "tUn". | _ |
| | | , allo talling (coll) | Action Time | N/A | - |
| Ella | 25 | Parameter auto-tuning is processing. | Warning setting parameter | N/A | When the auto-tuning is finished, the |
| | 23 | When running auto- tuning, the keypad displays "tUn". | Reset method | When auto-tuning is finished and no error occurs, the warning automatically clears. | warning automatically clears. |
| | | displays ton . | Reset condition | When auto-tuning is finished and no error occurs. | |
| | | | Record | N/A | |
| | | | Action Level | P06.47 | 1) Check for unbalanced three-phase motor impedance and replace the |
| | | | Action Time | N/A | motor if needed. 2) Check the cable and replace if |
| oPHL | 28 | Output phase loss (oPHL) Output phase loss of the drive | Warning setting parameter | P06.45 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning | 4) Check if the control board cable is loose. If yes, reconnect the cable an run the drive to test. If the error still |
| | | | Reset method | If P06.45 is set to 0, the oPHL warning automatically clears after the drive stops. | occurs, contact AutomationDirect Technical Support. 5) Check if the three-phase current is balanced with a current clamp meter If the current is balanced and the |
| | | | Reset condition | N/A | oPHL error still shows on the displa contact AutomationDirect Technical |
| | | Record | N/A | 6) Verify the drive's capacity matches of exceeds the motor's. | |
| 5E3 30 | | Copy model error 3 | Action Level | "SE3" warning occurs when different drive identity codes are found during copying parameters. | |
| | 30 | (SE3) | Action Time | Immediately act when the error is detected | It is mainly to prevent parameter copies |
| | | Keypad COPY error 3: copy model error | Warning setting parameter | N/A | between different HP/models. |
| | | | Reset method | Manual reset | |
| | | | | N/A | |
| | | 1 | Record | N/A | |

| | | | Warning | Codes (continued) | |
|---------------------------------|--------|--|------------------------------|---|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | P14.75 | 1) Configure the settings for P14.75 and P14.76 again. |
| | | | Action Time | P14.76 | 2) Check for mechanical error and remove the causes of malfunction. 3) Verify load and decrease the loading |
| ot 3 | 31 | Over-torque (ot3) Over-torque 3 warning | Warning setting parameter | P14.74 Over-torque Detection Selection (Motor 3) = 1 or 3 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN | or replace with a motor with larger capacity if load is too high. 4) Verify accel/decel time and increase the setting values for P01.12–P01.19 (accel./ decel. time) if work cycle is too short. 5) Verify V/F voltage and adjust the V/F curve (Motor 3, P01.54–P01.61), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). 6) Replace motor with a larger capacity motor. 7) Check for overload during low-speed operation and decrease the loading during low-speed operation or increase the motor capacity. |
| | | | Reset method | When the output current < P14.75, the ot3 warning automatically clears | 8) Verify torque compensation and adjust P07.73 torque compensation gain until the output current decreases and the motor does not |
| | | | Reset condition | When the output current < P14.75, the ot3 warning automatically clears | stall. 9) Correct the parameter settings for speed tracking. Start the speed tracking function. Adjust the |
| | | | Record | N/A | maximum current for P07.09 speed tracking. |
| | | | (conti | nued next page) | |

| Display on | | | Warning | Codes (continued) | |
|------------|--------|--|--------------------------------|--|--|
| | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | P14.78 | 1) Configure the settings for P14.78 and P14.79 again. |
| | | | Action Time | P14.79 | Check for mechanical error and remove the causes of malfunction. Verify load and decrease the loading |
| oE4 | 32 | Over-torque (ot4) Over-torque 4 warning | Warning setting parameter | P14.77 Over-torque Detection Selection (Motor 4) =1 or 3 O: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN | or replace with a motor with larger capacity if load is too high. 4) Verify accel/decel time and increase the setting values for P01.12–P01.19 (accel./ decel. time) if work cycle is too short. 5) Verify V/F voltage and adjust the V/F curve (Motor 3, P01.63–P01.70), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). 6) Replace motor with a larger capacity motor. 7) Check for overload during low-speed operation and decrease the loading |
| | | | Reset method | When the output current < P14.78, the ot4 warning automatically clears | during low-speed operation or increase the motor capacity. 8) Verify torque compensation and adjust P07.75 torque compensation gain until the output current |
| | | | Reset condition | When the output current < P14.79, the ot4 warning automatically clears | decreases and the motor does not stall.Correct the parameter settings for speed tracking. Start the speed |
| | | | Record | N/A | tracking function. Adjust the maximum current for P07.09 speed tracking. |
| | | | Action Level | During PLC downloading, the program source code detects incorrect address (e.g. the address exceeds the range), then the PLod warning occurs. | |
| PLod | 50 | PLC opposite defect (PLod) PLC download error warning | Action Time | Immediately act when the fault is detected | |
| | | | Warning setting parameter | N/A | Verify the data number used when downloading the PLC program and use the correct data number. |
| | | | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition Record | N/A N/A | |
| | | | Action Level | The program detects incorrect written address (e.g. the address exceeds the range) during PLC operation, then the PLSv warning occurs. | |
| PLSu | 51 | PLC save memory error (PLSv) 1 Data error during PLC operation | Action Time Warning setting | Immediately act when the fault is detected | Make sure the written address is correc and download the program again. |
| | | | Reset method | N/A Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition | N/A | |
| | | | Record | N/A nued next page) | |

| | | | Warning | Codes (continued) | |
|---------------------------------|--------|--|------------------------------|---|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | The program detects incorrect written address when translating the program source code (e.g. the address exceeds the range) during PLC downloading, then PLdA warning occurs. | |
| PLdA | 52 | Data defect (PLdA) | Action Time | Immediately act when the fault is detected | Check if the upper unit transmits the |
| | 52 | Data error during PLC operation | Warning setting parameter | N/A | correct command. |
| | | | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition | N/A | |
| | | | Record | N/A | |
| | | | Action Level | The program detects incorrect command (unsupported command) during PLC downloading, then PLFn warning occurs. | |
| | | Function defect (PLFn) | Action Time | Immediately act when the fault is detected | Check the drive firmware and if not the latest version, download and install the latest version from the ADC support |
| PLFn | 53 | PLC download function | Warning setting parameter | N/A | |
| | | code error | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | website |
| | | | Reset condition | N/A | |
| | | | Record | N/A | |
| | | | Action Level | When PLC runs the last command and the command exceeds the maximum capacity of the program, then PLor warning occurs. | |
| PLor | 54 | PLC buffer overflow (PLor) PLC register overflow | Action Time | Immediately act when the fault is detected | Follow the steps below to reset the PLC software: |
| | | | Warning setting parameter | N/A | Disable PLC Reset the PLC program (P00.02=6) |
| | | | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | a) Enable PLC 4) Re-download the PLC program |
| | | | Reset condition | N/A | |
| | | | Record | N/A | <u> </u> |
| | | | (contii | nued next page) | |

| Display on | | | Warning | Codes (continued) | |
|---------------------------------|--------|--|------------------------------|--|--|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | The program detects incorrect command (unsupported command) during PLC operation, then PLFF warning occurs. | |
| | | Function defect (PLFF) | Action Time | Immediately act when the fault is detected | When starting the PLC function and |
| PLFF | 55 | Function code error | Warning setting parameter | NA | there is no program in the PLC, the PLFF warning occurs. This is a normal warning |
| | | during PLC operation | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | please download the program. |
| | | | Reset condition | N/A | - |
| | | | Record Action Level | N/A PLC checksum error is detected after the drive is powered on, then PLSn warning occurs. | |
| | | | Action Time | Immediately act when the fault is detected | Follow the steps below to reset the PLC |
| | 5.0 | Checksum error (PLSn) | Warning setting parameter | NA | software: 1) Disable PLC 2) Reset the PLC program (P00.02=6) 3) Enable PLC 4) Re-download the PLC program |
| PLSn | 56 | PLC checksum error | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition | N/A | - |
| | | | Record Action Level | N/A The "End" command is missing. Until the last command is executed, the PLEd warning occurs. | |
| | | No end command (PLEd) 7 PLC end command is missing | Action Time | Immediately act when the fault is detected | Follow the steps below to reset the PLC software: 1) Disable PLC 2) Reset the PLC program (P00.02=6) 3) Enable PLC 4) Re-download the PLC program |
| PLEd | 57 | | Warning setting parameter | NA | |
| | 51 | | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition | N/A | |
| | | | Record Action Level | N/A The MC command is detected during PLC operation, but there is no corresponding MCR command, then the PLCr warning occurs. | |
| PLEr | 58 | PLC MCR error (PLCr) PLC MCR command error | Action Time | Immediately act when the fault is detected | The MC command cannot be used |
| | | | Warning setting parameter | NA | The MC command cannot be used continuously for 9 times. Check and reset the program, then re-download the program. |
| | | | Reset method | Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears. | |
| | | | Reset condition Record | N/A N/A | |
| | | | | nued next page) | 1 |

| Display on GS20(X) Keypad ID No. Warning Name and Description Action and Reset Corrective Action PLC download fail (PLdF) PLC download fail (PLdF) Action Level PLC download failure (PLdF) PLC download failure (PLdF) Action Time Immediately act when the fault is detected Check for programming errors, if the fault download the program again. download the program again. Check for programming errors, if the exist, correct and download the program again. Reset condition Check for Source Code errors, if the exist, correct and download the program again. download the program again. Action Level When the PLC scan time exceeds the maximum allowable time (400 ms), the PLS scan time exceeds the maximum allowable time Check for programming errors, if they exist, correct and download the program again. Reset condition NA PL SF F0 PLC scan time fail (PLSF) Action Level When the PLC scan time exceeds the maximum allowable time (400 ms), the PLS warning automatically clears. Reset condition NA Check for Source Code errors, if the exist, correct and download the pro again. PL SF F0 PLC scan time exceeds the maximum allowable time Reset method Check for programming errors, if the y exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for source Code errors, if the exist, correct and download the pro again. PL Set warning acrore scale <th>egram</th> | egram |
|--|--------|
| PLG for the maximum allowable time Action Level momentary power loss during download. After the power is again present, the PLdF warning occurs. Action Time Immediately act when the fault is detected Check for programming errors, if the set, correct and download the programming errors, if they exist, correct and download the programming errors, if they exist, correct and download the programming errors, if they exist, correct and download the program again. Check for programming errors, if the exist, correct and download the program again. PLC for the program in the program again. Reset method Check for programming errors, if they exist, correct and download the program again. PLS F FLC scan time fail (PLSF) PLC scan time fail (PLSF) When the PLC scan time exceeds the maximum allowable time (400 ms), the PLSF warning occurs. Action Time Immediately act when the fault is detected Check for programming errors, if the exist, correct and download the program again. PL SF FLC scan time exceeds the maximum allowable time Action Time Check for programming errors, if the exist, correct and download the program again. Check for Source Code errors, if the exist, correct and download the program again. PL SF FLC scan time exceeds the maximum allowable time Reset method Check for programming errors, if the exist, correct and download the program again. Reset condition N/A Reset condition N/A Check for programming errors, if the exist, correct | egram |
| PL dF 59 PLC download fail (PLdF) is detected is detected Check for programming errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for programming errors, if they exist, correct and download the program again. Check for programming errors, if they exist, correct and download the program again. Check for programming errors, if they exist, correct and download the program again. Check for programming errors, if they exist, correct and download the program again. PL SF 60 PLC scan time fail (PLSF) Action Level Marning setting parameter NA PL SF 60 PLC scan time exceeds the maximum allowable time (400 ms), the PLSF warning occurs. Check for programming errors, if the exist, correct and download the program again. Check for Source Code errors, if the exist, correct and download the program again. PL SF 60 PLC scan time exceeds the maximum allowable time Check for programming errors, if the exist, correct and download the program again. Check for Source Code errors, if the exist, correct and download the program again. Reset condition N/A Reset condition N/A PLC Reset condition N/A Reset condition N/A PLSF 60 PLC scan time exceeds the maximum allowable time fault is detected If the fault does not exist, the warning automatically clears.< | egram |
| PLdF 59 (PLdF) PLC download failure Warning setting parameter NA exist, correct and download the programing errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. again. PLSF 60 PLC scan time fail (PLSF) Action Level NA exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the PLS scan time fail (PLSF) PLC scan time fail (PLSF) Action Time Immediately act when the fault is detected Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A Reset condition N/A Reset condition N/A Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. Reset condition N/A NA Action Time again. Immediately clears. Reset condition N/A The SV power that the drive provides to the communication 1) Make sure the communication well inserted and not loose. <td>egram</td> | egram |
| PLC download failure PLC download failure Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A Reset condition N/A Reset condition N/A Reset condition N/A PLC scan time fail (PLSF) Action Level PLC scan time exceeds the maximum allowable time Action Time Immediately act when the fault is detected Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset method Reset method NA Reset method Reset method Immediately act when the fault is detected Warning setting parameter NA Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for source code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A Record N/A Record N/A The 5V power that the drive provides to the communication 1) Make sure the communication | |
| PLSF 60 Reset condition N/A PLSF For the maximum allowable Action Level When the PLC scan time exceeds the maximum allowable time (400 ms), the PLSF warning occurs. Action Time When the fault is detected PLC scan time fail (PLSF) PLC scan time exceeds the maximum allowable Action Time Warning setting parameter NA Check for Source Code errors, if the exist, correct and download the program again. PLC scan time exceeds the maximum allowable Reset method Check for programming errors, if they exist, correct and download the program again. Check for source code errors, if the exist, correct and download the program again. Reset condition N/A Reset condition N/A Reset condition N/A The 5V power that the drive provides to the communication 1) Make sure the communication well inserted and not loose. | |
| PLSF 60 PLC scan time fail (PLSF) Action Level When the PLC scan time exceeds the maximum allowable time (400 ms), the PLSF warning occurs. Check for Source Code errors, if the exist, correct and download the programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A NA Image: NA Record N/A NA Image: NA Image: NA Reset condition N/A NA Image: NA Image: NA Reset condition N/A Image: NA Image: NA Image: NA Reset condition N/A Image: NA Image: NA Image: NA Reset condition N/A Image: NA Image: NA Image: NA Reset condition N/A Image: NA Image: NA Image: NA Reset condition N/A Image: NA Image: NA Image: NA | |
| PLSF 60 PLC scan time fail (PLSF) Action Level exceeds the maximum allowable time (400 ms), the PLSF warning occurs. Immediately act when the fault is detected Check for Source Code errors, if the exist, correct and download the programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for Source Code errors, if the exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A N/A Immediately act when the drive provides to the communication well inserted and not loose. | |
| PLSF 60 Action time tail (PLSF) Action time is detected Check for Source Code errors, if the exist, correct and download the programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Reset condition N/A Record N/A The 5V power that the drive provides to the communication 1) Make sure the communication well inserted and not loose. | |
| PLSF 60 PLC scan time exceeds the maximum allowable time Warning setting parameter NA Check for Source Code errors, if the exist, correct and download the program again. Reset method Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. Action Level NA PLC scan time exceeds the maximum allowable errors, if they exist, correct and download the program again. Action Level The 5V power that the drive provides to the communication well inserted and not loose. | |
| PLC scar time exceeds the maximum allowable time Check for programming errors, if they exist, correct and download the program again. If the fault does not exist, the warning automatically clears. again. Reset condition N/A Record N/A The 5V power that the drive provides to the communication well inserted and not loose. 1) Make sure the communication well inserted and not loose. | ogram |
| Reset condition N/A Record N/A The 5V power that the drive provides to the communication 1) Make sure the communication well inserted and not loose. | |
| The 5V power that the drive 1) Make sure the communication Action Level provides to the communication 1) Make sure the communication | |
| Action Level provides to the communication well inserted and not loose. | |
| | |
| ExCom power loss (ECLv) Action Time Immediately act with another GS20 drive to che the ECLv warning still occurs. If replace with a new communica | f yes, |
| Low voltage of the Reset method Cycle the power card; if not, replace the drive. | |
| communication card Reset condition N/A 3) Use another communication card test if the ECLv warning still oct on the same drive. If not, replace the drive. | curs |
| Action Level The communication card is in the test mode | |
| ExCom test mode (ECtt) ExCom test mode (ECtt) Action Time Immediately act Warning setting parameter N/A Cycle the power | |
| card is in the test mode Reset method Cycle the power and enter the normal mode | |
| Reset condition N/A Record N/A | |
| Action Level Factory default setting error | |
| ExCom factory defect Action Time Immediately act | |
| EEFF 75 (ECFF) Warning setting parameter N/A Use GSoft2 to download a new parameter set into the drive. | |
| Factory default setting error Reset condition N/A Record N/A | |
| (continued next page) | |

| D: / | | | vvurnung | Codes (continued) | |
|---------------------------------|---------------------------|---|------------------------------|--|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level Action Time | Internal memory saving error Immediately act | 1) Verify the wiring of the control circuit, and the wiring/grounding |
| | 76 | ExCom inner error (ECiF) | Warning setting parameter | N/A | of the main circuit to prevent interference. |
| EE ıF | 76 | | Reset method | Cycle the power | 2) Cycle the power. |
| | | Serious internal error | Reset condition | N/A | 3) Reset to the default value and check |
| | | | Record | N/A | if the error still exists. If yes, replace the communication card. |
| | | | Action Level | Hardware detection | |
| | | Ethernet link fail (ECEF) | Action Time | Immediately act | |
| ECEF | 80 | | Warning setting parameter | N/A | 1) Re-connect the cable |
| | | The Ethernet cable is not connected | Reset method | Manual reset | 2) Replace the cable |
| | | not connected | Reset condition | N/A | _ |
| | | | Record | N/A | |
| | | | Action Level | Software detection | _ |
| | | Checksum error (ECCS) | Action Time | N/A | |
| EEES | 82 | 2 Checksum error for the communication card and the drive | Warning setting parameter | N/A | Verify the wiring of the control circuit and the wiring/grounding of the mai |
| | | | Reset method | Manual reset | circuit to prevent interference. |
| | | | Reset condition | Immediately reset | |
| | | | Record | N/A | |
| | | Return defect (ECrF) Communication card returns to the default setting | Action Level | Communication card returns to the default setting | No actions required. |
| | | | Action Time | N/A | |
| EErF | 83 | | Warning setting parameter | N/A | |
| | | | Reset method | Manual reset |] |
| | | | Reset condition | Immediately reset | _ |
| | | | Record | N/A | |
| ΕርοΟ 84 | | | Action Level | Hardware detection | Verify the Master communication value does not exceed the allowal number of communication cards. If it does, decrease the Master communication value. Check if the connection is occupie |
| | | | Action Time | Immediately act | |
| | Modbus TCP over (ECo0) | Warning setting parameter | N/A | Check if the connection is occupied due to not disconnecting the Modbus TCP while the upper unit is connected without communicating it is, revise the program of the upper | |
| | 84 | ⁸⁴ Modbus TCP exceeds the maximum communication value | Reset method | Manual reset | unit to disconnect the connection while the communication is not use for a long time. |
| | | | Reset condition | Immediately reset | Check if a new Modbus TCP connection is built whenever the upper unit is connected to the communication card. If so, revise th program of the upper unit to use |
| | | | Record | N/A | the same Modbus TCP connection when connecting to the same communication card. |

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| Display on | | | Warning | Codes (continued) | |
|-------------------|--------|--|---|---|---|
| GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | et | Corrective Action |
| | | | Action Level | Hardware detection | Verify the Master communication value does not exceed the allowable number of communication cards. |
| | | | Action Time | Immediately act | If it does, decrease the Master communication value.2) Check if the connection is occupied |
| ECo 1 | 85 | EtherNet/IP exceeds | Warning setting parameter | N/A | due to not disconnecting the Modbus TCP while the upper unit is connected without communicating. I it is, revise the program of the upper unit to disconnect the connection |
| | | the maximum communication value | Reset method | Manual reset | while the communication is not used for a long time.3) Check if a new Modbus TCP connection is built whenever the |
| | | | Reset condition | Immediately reset | upper unit is connected to the communication card. If so, revise the program of the upper unit to use |
| | | | Record | N/A | the same Modbus TCP connection when connecting to the same communication card. |
| | | | Action Level | Software detection | _ |
| | | | Action Time | Immediately act | |
| EC ,P | 86 | IP fail (ECiP) IP setting error | Warning setting parameter | N/A | Reset IP Contact MIS to check if DHCP Server |
| | | | Reset method Reset condition | Manual reset | works normally |
| | | | Record | Immediately reset N/A | - |
| | | | Action Level | Software detection | |
| | | ExCom busy (ECbY) Communication card busy: too many packets are received | Action Time | N/A | |
| ЕСЬУ | 88 | | Warning setting parameter | N/A | Decrease communication packets |
| | | | Reset method | Manual reset | _ |
| | | | Reset condition | N/A | - |
| | | | Record Action Level | N/A Communication card break off | |
| | | Communication card break off warning | Action Time | N/A | Re-install the communication card |
| ЕССЬ 89 | | | Warning setting parameter | N/A | |
| | 89 | | | Auto-resets after the | |
| | | | Reset method | communication card is re- installed | |
| | | | | Immediately reset | |
| | | | Record | N/A | |
| | | Copy PLC: password | Action Level | PLC password is incorrect | - |
| | | error (CPLP) | Action Time Warning setting parameter | Immediately act N/A | |
| EPLP | 90 | Copy PLC password error. When PLC copy is processing and the PLC password is incorrect, | Reset method | Manual reset | Reset and enter the correct PLC password |
| | | | Reset condition | Directly reset | |
| | | the CPLP warning occurs. | Record | N/A | |
| [PLD 91 | | Copy PLC: Read mode | Action Level | Incorrect process when copying the PLC read mode | Cycle the power and copy the PLC read |
| | 91 | error (CPL0) | Action Time Warning setting | Immediately act N/A | |
| | | Copy PLC read mode | parameter Reset method | / Manual reset | mode again |
| | | error | Reset condition | Directly reset | - |
| | | Record | N/A | | |
| | | | | | |

| | | | vvarning | Codes (continued) | 1 |
|---------------------------------|------------------------------|--|--------------------------------|--|---|
| Display on GS20(X) Keypad | ID No. | Warning Name and Description | Action and Res | | Corrective Action |
| | | Copy PLC: Write mode | Action Level Action Time | Incorrect process when copying the PLC write mode Immediately act | - |
| EPL I | 92 | (CPL1) | Warning setting parameter | N/A | Cycle the power and copy the PLC write mode again |
| | Copy PLC write mode error | Reset method Reset condition | Manual reset Directly reset | | |
| | | | Record | N/A | - |
| | | Copy PLC: version error | Action Level | Software detection | - |
| | | (CPLv) | Action Time | Immediately act | - |
| EPLu | 93 | Copy PLC version error. When a non-GS20(X) | Warning setting parameter | N/A | Check if the copied PLC program is for GS20(X). If not, use the correct GS20(X) |
| | | built-in PLC is copied to | Reset method | Manual reset | PLC program. |
| | | the GS20(X) drive, the | Reset condition | Directly reset | |
| | | CPLv warning occurs. | Record | N/A | |
| | | | Action Level | Software detection | |
| | | Copy PLC: size error (CPLS) | Action Time | Immediately act | |
| CPLS | 94 | | Warning setting parameter | N/A | Check if the copied PLC program is for GS20(X). Use the correct capacity for the |
| | | Copy PLC capacity error | Reset method | Manual reset | GS20(X) PLC program. |
| | | | Reset condition | Directly reset | |
| | | | Record | N/A | |
| | | Copy PLC: PLC function (CPLF) Copy PLC function must be executed when PLC is disabled. | Action Level | Software detection | _ |
| | | | Action Time | Immediately act | |
| | | | Warning setting | N/A | Disable the PLC function first, and then |
| EPLF | 95 | | parameter | | run the PLC copy function again. |
| | | | Reset method | Manual reset | |
| | | | Reset condition | Directly reset | |
| | | | Record | N/A | |
| | | | Action Level | Software detection | |
| | | Copy PLC: time-out | Action Time | Immediately act | - |
| EPLE 96 | 96 | (CPLt) | Warning setting parameter | N/A | The GS20-KPD cannot be removed during the PLC copy process |
| | | Copy PLC time-out | Reset method | Manual reset | |
| | | | Reset condition | Directly reset | - |
| | | | Record | N/A | |
| ictn ¹⁰¹ | | Internal communication | Action Level | When P09.31 = $(-1) - (-10)$ (no -9) and the internal communication between Master and Slave is abnormal, the ictn warning occurs. |) Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree |
| | | | Action Time | Immediately act | for effective anti-interference |
| | 101 | | Warning setting parameter | N/A | performance. 2) Check if the setting for P09.04 is the |
| | | time-out | Reset method | Auto-reset | same as the setting for the upper |
| | | | Reset condition | The warning automatically clears when the communication is back to normal condition | unit |
| | | | Record | N/A | |

FAULT CODES

The GS20(X) drive has a comprehensive fault diagnostic system that include a variety of fault messages. When a fault is detected, the GS20(X) drive will shut down in order to protect internal components. The following faults are displayed as shown on the GS20(X) digital keypad display.

For communication errors, "Upper unit" is referring to the Master controller of the serial network. Always ensure the communication settings of the drive (P09.01 and P09.04) match those of the master controller and network.



Gaps in the fault ID numbers below are set aside as "reserved" faults for possible future use. Should your GS20(X) drive <u>repeatedly</u> display a reserved fault, please note the fault ID number and contact AutomationDirect technical support.

| er-current during | Action, Reset, of Action Level Action Time Fault setting parameter Reset method Reset condition Record | 300% of the rated current Immediately act N/A Manual reset Reset in five seconds after the fault is cleared Yes 1) Check acceleration time. If too short: a) Increase the acceleration time b) Increase the acceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current stall prevention function (P06.03) e) Replace the drive with a larger capacity model. |
|---|---|---|
| er-current during | Action Time Fault setting parameter Reset method Reset condition | Immediately act N/A Manual reset Reset in five seconds after the fault is cleared Yes 1) Check acceleration time. If too short: a) Increase the acceleration time b) Increase the acceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current stall prevention function (P06.03) |
| eleration (ocA) tput current exceeds ee times of the ed current during eleration. uen ocA occurs, the ve closes the gate of output immediately, motor runs freely, d the display shows ocA error. | Corrective Actions | Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check the motor insulation value with megger. Replace the motor if the insulation is poor. Check if the output current during the whole working process exceed the AC motor drive's rated current. If yes, replace the AC motor drive with a larger capacity model. Reduce the load or increase the capacity of AC motor drive. Check the motor capacity (the rated current on the motor's nameplate should ≤ the rated current of the drive). Check the action timing of the contactor and make sure it is not turned ON/OFF when the drive outputs the voltage. Adjust the V/F curve setting and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Adjust the torque compensation (refer to P07.26 torque compensation gain) until the output current reduces and the motor does not stall. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Enable speed tracking during start-up of P07.12. Correct the parameter settings for speed tracking. a) Start the speed tracking function. b) Adjust the maximum current for P07.09 speed tracking. |
| | | does not stall. 10) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 11) Enable speed tracking during start-up of P07.12. 12) Correct the parameter settings for speed tracking. a) Start the speed tracking function. b) Adjust the maximum current for P07.09 speed tracking. |
| ed ier /e o n | current during eration. n ocA occurs, the closes the gate of utput immediately, notor runs freely, he display shows | current during eration. n ocA occurs, the closes the gate of utput immediately, notor runs freely, he display shows |

| GS20(y) ID No. Puller Value and Description Action, Reset, and Corrective Action BCC I ocA (continued) Is in the case of hardware failure, the ocA occurs due to the short circuit or ground fault at the output side of the drive. a) Check for possible short circuits between terminals with the electric meter: I ocA (continued) Corrective Actions (contd) Is in the case of hardware failure, the ocA occurs due to the short circuit or ground fault at the output side of the drive. a) Check for possible short circuit doe of the drive. a) Check for possible short circuit doe of the drive. b) Is corresponds to U, V and W. corresponds to U, V and We as needed the AC motor drives and fequency Voltage. When the fault corrus and the requery voltage is to not sing an UNI the output circuit or the drive corrus the woltage. corresponds to U, V and W. corresponds to U, V and W. coresponds to U, V and | | | | Fault C | odes (continued) |
|--|-----|--------|---|-----------------------|---|
| Ocr 1 ocA (continued) Corrective Actions (control or ground fault at the output side of the drive. a) Check for possible short circuit spetween terminals with the electric meter. b) B1 corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corresponds to U, V and W, DC- corresponds to U, V and W, Corrective Static Mathematic Mathematic Mathematic Mathematic Pault setting Parameter N/A Reset condition N/A Reset condition Reset in Mitro Mathematic Pault setting Parameter N/A Reset condition N/A Reset condition Reset in Mitro Mathematic Pault setting Pault settin | | ID No. | | Action, Reset, c | and Corrective Action |
| ocd 2 Action Time Immediately act Fault setting N/A Reset condition Reset in five seconds after the fault is cleared Reset condition Reset in five seconds after the fault is cleared Record Yes 1) Check if the deceleration time of 5-curve c) Set out-acceleration and auto-deceleration (P06.03) e) Increase the deceleration time of 5-curve c) Set outo-acceleration and auto-deceleration (P06.03) e) Replace the dive with a larger capacity model 2) Check the motor cable and remover causes of any short circuits, or replace the cable before turining on the power. 3) Check the motor current during the whole working process exceed the Cause to drive sit rated current during the whole working process exceed the Cause of any short direction. When ocd occurs, the drive does the gate of the output current of the drive. Corrective Actions Actions Corrective Actions Actions an ocd error. Corrective Actions Actions Corrective Actions Attribut turrent exceeds three tings of the contactor and make sure it is not turned ON/OFf when the drive output turrent fault such action timing of the contactor and make sure it is not turned ON/OFf when the drive output current reduces and the dreq | осЯ | 1 | ocA (continued) | | or ground fault at the output side of the drive. a) Check for possible short circuits between terminals with the electric meter: b) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. c) If short circuit occurs, contact AutomationDirect Technical Support. 17) Check the stall prevention setting and set the stall prevention to the |
| Over-current during deceleration (ord) N/A Manual reset Reset method Manual reset Reset in five seconds after the fault is cleared Record Yes I Check if the deceleration time is too short. If so: a) Increase the deceleration time b) Increase the deceleration time b) Increase the deceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current stall prevention function (P06.03) e) Replace the drive with a larger capacity model Check if the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check if the motor insulation value with megger. Replace the motor increase the capacity of AC motor drive as needed. Check if the output current during the whole working process exceed the AC motor drive's rated current. If yes, replace the AC motor drive with a larger capacity model. Check if the output current during the whole working process exceed the AC motor drive's rated current of the drive. Verify the motor capacity. The rated current on the motor's nameplate should s the rated current of the drive. Ming an ON/OFF controller at the (U/V/W) drive output, check the action timing of the control aron make sure it is not turned ON/OFF when the drive outputs the voltage. No deterror. Actions Actions Nig of the control crucit and the wing/grounding of the matior cable. If it is too long, increase the AC motor drive's capacity or instal AC rea | | | | Action Level | |
| ocd 2 parameter WA Reset condition Reset in five seconds after the fault is cleared Record Yes Image: Condition Reset condition Reset condition Reset condition Reset condition Reset condition Record Yes Image: Condition Reset condition Reset conditin the condition Reset condition< | | | | | Immediately act |
| Over-current during deceleration (arrest) Reset method Manual reset Reset condition Reset in five seconds after the fault is cleared Record Yes Over-current during deceleration time is too short. If so: a) Increase the deceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current shall prevention function (P06.03) e) Replace the drive with a larger capacity model Check if the mechanical brake of the motor activates too early. Check the motor insulation value with megger. Replace the motor if the insulation is poor. Check the motor capacity model. Check the impulsive change of the load and reduce the load or increase the capacity of AC motor drives a needed. Verify the motor capacity, model. Check the impulsive change of the load and reduce the load or increase the capacity of AC motor drives in the (U/VW) drive output, check the action timing of the control routor and make sure it is not turned ON/OFF when the drive olage. Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Check the length of the motor capacity or install AC reactor(s) on the output side (U/VW). | | | | - | N/A |
| Over-current during deceleration (ocd) Reset in five seconds after the fault is cleared Ves 1 Check if the deceleration time is too short. If so: a) Increase the deceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current stall prevention function (P06.03) e) Replace the drive with a larger capacity model Over-current during deceleration (ocd) OLeck the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Output current exceeds three times of the rated current during deceleration. When ocd occurs, the drive closes the gate of the output timmediately, the motor capacity of AC motor drive and the display shows an ocd error. Corrective Actions an ocd error. Actions an ocd error. Si f using an ON/OFF controller at the drive. If using an ON/OFF controller at the drive. Actions an ocd error. Adjust the V/F curve settings and frequency/voltage. When the failut occurs, and the requery voltage is too high, reduce the voltage. In Adjust the V/F curve setting of the contor drive is rated current. Nerify the motor capacity of neces the desole. If it stoo long, increase the AC motor drive's capacity or install AC reactor(s) on the output current reduces and the motor drive drive. If using an ON/OFF controller at the twirng/grounding of the main circuit to prevent interference. Adjust the V/F curve settings and | | | | | |
| Image: Construct of the second in the sec | | | | | |
| Check if the deceleration time is too short. If so: a) Increase the deceleration time b) Increase the deceleration time of 5-curve c) Set auto-acceleration and auto-deceleration (P60.03) e) Replace the drive with a larger capacity model 2) Check if the mechanical brake of the motor activates too early. 3) Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 4) Check the motor rable and remove causes of any short circuits, or replace the cable before turning on the power. 4) Check the motor rable and remove causes of any short circuits, or replace the cable before turning on the power. 4) Check the motor rable and remove causes of any short circuits, or replace the cable before turning on the power. 4) Check the motor rable and remove causes of any short circuits, or replace the cable before turning on the power. 5) Check if the output current during the whole working process exceed the AC motor drive's rated current of the AC motor drive is rated current of the AC motor drive's rated current on the motor's nameplate should ≤ the rated current of the drive. 6) Check the impulsive change of the load and reduce the load or increase the capacity of AC motor drive as needed. 7) Verify the motor capacity, the rated current of the drive. 8) If using an ON/OFF controller at the (U/V/W) drive output, check the action timing of the contractor and make sure it is not turned ON/OFF when the drive output is the voltage. 9) Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. 10) Adjust the O7.26 torror cable. If it is too long, increa | | | | | |
| Support. 14) Verify the stall prevention setting and set the stall prevention to the proper value. | ocd | 2 | deceleration (ocd) Output current exceeds three times of the rated current during deceleration. When ocd occurs, the drive closes the gate of the output immediately, the motor runs freely, and the display shows | Corrective Actions | Check if the deceleration time is too short. If so: a) Increase the deceleration time of S-curve c) Set auto-acceleration and auto-deceleration parameter (P01.44) d) Set over-current stall prevention function (P06.03) e) Replace the drive with a larger capacity model Check if the mechanical brake of the motor activates too early. Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check the motor insulation value with megger. Replace the motor if the insulation is poor. Check if the output current during the whole working process exceeds the AC motor drive's rated current. If yes, replace the AC motor drive with a larger capacity model. Check the impulsive change of the load and reduce the load or increase the capacity model. Check the motor capacity, the rated current on the motor's nameplate should ≤ the rated current of the drive. If using an ON/OFF controller at the (U/V/W) drive output, check the action timing of the contactor and make sure it is not turned ON/OFF when the drive outputs the voltage. Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Adjust the P07.26 torque compensation gain until the output current reduces and the motor does not stall. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check the length of the motor cable. If it is too long, increase the AC motor drive's capacity or install AC reactor(s) on the output side (U/V/W). In the case of a hardware error, the ocd occurs due to the short circuit or ground fault at the output side of the drive. Check the length of the motor cable. If it i |
| | | | | (contir | nued next page) |

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| | | | Fault C | Codes (continued) |
|---------------------------------|--------|---|---------------------------------|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| Поурии | | | Action Level Action Time | 300% of the rated current Immediately act |
| | | | Fault setting parameter | N/A |
| | | | Reset method | Manual reset |
| | | | Reset condition Record | Reset in five seconds after the fault is cleared Yes |
| פבח | 3 | Over-current during steady operation (ocn) Output current exceeds three times of the rated current during constant speed. When ocn occurs, the drive closes the gate of the output immediately, the motor runs freely, and the display shows an ocn error. | Corrective Actions | Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check for possible shaft lock, burnout or aging insulation of the motor. a) Check the motor insulation value with megger. Replace the motor if the insulation is poor. Check for impulsive change of the load, and reduce the load or increase the capacity of AC motor drive. Check motor capacity (the rated current on the motor's nameplate should ≤ the rated current of the drive) If using an ON/OFF controller at the drive output, check the action timing of the contactor and make sure it is not turned ON/OFF when the drive outputs the voltage. Adjust the V/F curve settings and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. Adjust P07.26 torque compensation gain until the output current reduces and the motor does not stall. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check the length of the motor cable. If too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side of the drive. a) Check for possible short circuit between terminals with the electric meter: b) B1 corresponds to U, V and W; DC- corresponds to U, V, and W; corresponds to U, V, and W. c) If short circuits occurs, contact AutomationDirect Technical Support. |
| | | | Action Level | N/A |
| | | | Action Time Fault setting | N/A |
| | | | parameter | N/A |
| | | | Reset method | Manual reset |
| | | Ground fault (GFF) | | |
| 9FF | 4 | When the drive detects grounding short circuit on the output terminals (U/V/W), the drive closes the gate of the output immediately, the motor runs freely, and the display shows a GFF error. | Record Corrective Actions | Yes Check for motor burnout or aging insulation. a) Check the motor insulation value with megger. b) Replace the motor if the insulation is poor. Check the cable for short circuits and replace the cable if needed. If the motor cable length exceeds 100 m, decrease the setting value for the carrier frequency and take remedies to reduce stray capacitance. Verify the grounding and wiring of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. |
| | | | (conti | 5) Cycle the power after checking the status of motor, cable, and cable length. If GFF still exists, contact AutomationDirect Technical Support. 6) Refer to the corrective actions for ocn. 7) Refer to the corrective actions for ocA. 8) Refer to the corrective actions for ocd. mued next page) |

| | | | Fault | Codes (continued) |
|---------------------------------|--------|---|--|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| | | Over-current at stop | Action Level | 300% of the rated current |
| | | (ocS) | Action Time | Immediately act |
| | | Over-current or | Fault setting parameter | N/A |
| | | hardware failure in | Reset method | Manual reset |
| oc5 | 6 | current detection at | Reset condition | Reset in five seconds after the fault is cleared |
| 000 | - | stop. | Record | Yes |
| | | Cycle the power after ocS occurs. If the hardware failure occurs, the display shows cd1, cd2 or cd3. | Corrective Actions | Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check if other error codes such as cd1–cd3 occur after cycling the power. If yes, return to the factory for repair. |
| | | | | 120V/230V series: 410VDC |
| | | | Action Level | 460V series: 820VDC 575V series: 1116VDC |
| | | Action Time | Immediately act when the DC bus voltage is higher than the level | |
| | | | Fault setting | |
| | | | parameter | N/A |
| | | | Reset method | Manual reset |
| | | | Reset condition | Reset only when the DC bus voltage is lower than 90% of the over- |
| | | | Record | voltage level Yes |
| | | | Record | 1) Check acceleration. If too slow: |
| ouR | 7 | Over-voltage during acceleration (ovA) DC bus over-voltage during acceleration. When ovA occurs, the drive closes the gate of the output, the motor runs freely, and the display shows an ovA error. | Corrective Actions | a) Decrease the acceleration time b) Use a braking unit or DC bus c) Replace the drive with a larger capacity model. 2) Check the setting for stall prevention level. If the value is lower than no-load current, adjust it to be higher than no-load current. 3) Check if the input voltage is within the rated AC motor drive input voltage range, and check for possible voltage spikes. 4) If the phase-in capacitor or active power supply unit acts in the same power system, the input voltage may surge abnormally in a short time. In this case, install an AC reactor. 5) Check for regenerative voltage of motor inertia. If regenerative voltage is being generated: a) Use over-voltage stall prevention function (P06.01) b) Use auto-acceleration and auto-deceleration setting (P01.44) c) Use a braking unit or DC bus 6) Check if the over-voltage Fault occurs after acceleration stops, which indicates acceleration time is too short. Do the following: a) Increase the acceleration time b) Set P06.01 over-voltage stall prevention c) Increase the setting value for P01.25 S-curve acceleration arrival time 2 7) The ground short circuit current charges the capacitor in the main circuit through the power. Check if there is a ground fault on the motor cable, wiring box, or its internal terminals. 8) If using a braking resistor or brake unit, check the wiring. 9) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. |

| Display on | | | Fault C | Codes (continued) |
|------------|--------|---|---|--|
| | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| oud | 8 | Over-voltage during deceleration (ovd) DC bus over-voltage during deceleration. When ovd occurs, the drive closes the gate of the output immediately, the motor runs freely, and the display shows an ovd error. | Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions | 120V/230V series: 410VDC 460V series: 820VDC 575V series: 1116VDC Immediately act when the DC bus voltage is higher than the level N/A Manual reset Reset only when the DC bus voltage is lower than 90% of the over-voltage level Yes 1) Deceleration time may be too short, resulting in too much regenerative energy. a) Increase the setting value of P01.13, P01.15, P01.17 and P01.19 (deceleration time) b) Connect a braking resistor, braking unit or DC bus on the drive. c) Reduce the braking frequency. d) Replace the drive with a larger capacity model. e) Use S-curve acceleration/deceleration (P01.44). h) Adjust the braking level (P07.01 or the bolt position of the braking unit). 2) Verify that the setting for stall prevention level is larger than no-load current 3) Check if the input voltage is within the rated AC motor drive input voltage range, and check for possible voltage spikes. 4) If the phase-in capacitor or active power supply unit acts in the same power system, the input voltage may surge abnormally in a short time. In this case, install an AC reactor. 5) The ground short circuit current charges the capacitor in the main circuit through the power. Check if there is ground fault on the moto cable, wiring box, or its internal terminals. 6) If using a braking resistor or braking unit, check the wiring. 7) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interforence. |
| סטח | 9 | Over-voltage during constant speed (ovn) DC bus over-voltage at constant speed. When ovn occurs, the drive closes the gate of the output immediately, the motor runs freely, and the display shows an ovn error. | Corrective Actions | the main circuit to prevent interference. 120V/230V series: 410VDC 460V series: 820VDC 575V series: 1116VDC Immediately act when the DC bus voltage is higher than the level N/A Manual reset Reset only when the DC bus voltage is lower than 90% of the over-voltage level Yes 1) Check for impulsive change of the load, then do the following: a) Connect a brake resistor, braking unit or DC bus to the drive. b) Reduce the load. c) Replace the drive with a larger capacity model. d) Adjust the braking level (P07.01 or bolt position of the brake unit). 2) Verify the stall prevention level setting is higher than no-load current 3) Check for regenerative voltage, then enable over-voltage stall prevention function (P06.01) or use a braking unit or DC bus 4) Check if the input voltage is within the rated AC motor drive input voltage range, and check for possible voltage spikes. 5) If the phase-in capacitor or active power supply unit acts in the same power system, the input voltage may surge abnormally in a short time. In this case, install an AC reactor. 6) The ground short circuit current charges the capacitor in the main circuit through the power. Check if there is ground fault on the moto cable, wiring box, or its internal terminals. 7) If using a braking resistor or braking unit, check the wiring. 8) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. |

| Fault Codes (continued) | | | | | |
|---------------------------------|--------|--|---------------------------------|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action | |
| | | | Action Level | 120V/230V series: 410VDC 460V series: 820VDC 575V series: 1116VDC Immediately act when the DC bus voltage is higher than the level | |
| | | | Fault setting parameter | N/A | |
| | | | Reset method | Manual reset | |
| | | | Reset condition | Reset only when the DC bus voltage is lower than 90% of the over- voltage level | |
| 5ن | 10 | Over-voltage at stop (ovS) Over-voltage at stop | Record Corrective Actions | Yes Check if the input voltage is within the rated AC motor drive input voltage range, and check for possible voltage spikes. If the phase-in capacitor or active power supply unit acts in the same power system, the input voltage may surge abnormally in a short time. In this case, install an AC reactor. The ground short circuit current charges the capacitor in the main circuit through the power. Check if there is ground fault on the motor cable, wiring box, or its internal terminals. If using a braking resistor or braking unit, check the wiring. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check if other error codes such as cd1–cd3 occur after cycling the power. If yes, contact AutomationDirect Technical Support. | |
| | | | Action Level | P06.00 (120V/230V series = 180VDC 460V series = 360VDC 575V series = 450VDC) | |
| | | | Action Time | Immediately act when the DC bus voltage is lower than P06.00 | |
| | | Low-voltage during acceleration (LvA) DC bus voltage is lower than P06.00 setting value during acceleration | Fault setting parameter | N/A | |
| | | | Reset method | Manual reset | |
| | | | Reset condition | Reset when the DC bus voltage is higher than P06.00 + 30 V | |
| LuA | | | Record Corrective Actions | Yes 1) Improve power supply condition. 2) Adjust voltage to the power range of the drive 3) Check the power system and increase the capacity of power equipment if needed. 4) The load may be too heavy. If so: a) Reduce the load. b) Increase the drive capacity. c) Increase the acceleration time. 5) Check the DC bus and install DC reactor(s). 6) Check for a short circuit plate or DC reactor installed between terminal +1 and +2. Connect short circuit plate or DC reactor between terminal +1 and +2. 7) If the error still exists, contact AutomationDirect Technical Support. | |
| | | Low-voltage during deceleration (Lvd) DC bus voltage is lower than P06.00 setting value during deceleration | Action Level | P06.00 (120V/230V series = 180VDC 460V series = 360VDC 575V series = 450VDC) Immediately act when the DC bus voltage is lower than P06.00 | |
| | | | Fault setting parameter | N/A | |
| | | | Reset method | Manual reset | |
| Lud | | | Reset condition Record | Reset when the DC bus voltage is higher than P06.00 + 30 V Yes 1) Improve power supply condition. | |
| | | | Corrective Actions | Adjust voltage to the power range of the drive Adjust voltage to the power range of the drive Check the power system and increase the capacity of power equipment if needed. The fault may be triggered by sudden load. If so: a) Reduce the load. b) Increase the drive capacity. Check the DC bus and install DC reactor(s). | |
| | | | (contii | nued next page) | |

| Fault Codes (continued) | | | | | |
|---------------------------------|--------|---|--|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action | |
| | | Low-voltage at | Action Level | P06.00 (120V/230V series = 180VDC 460V series = 360VDC 575V series = 450VDC) Immediately act when the DC bus voltage is lower than P06.00 | |
| | | | Fault setting | N/A | |
| | 10 | constant speed (Lvn) | Reset method Reset condition | Manual reset Reset when the DC bus voltage is higher than P06.00 + 30 V | |
| Lun | 13 | DC bus voltage is lower | Record | Yes | |
| | | than P06.00 setting value at constant speed | Corrective Actions | Improve power supply condition. Adjust voltage to the power range of the drive Check the power system and increase the capacity of power equipment if needed. The fault may be triggered by sudden load. If so: a) Reduce the load. b) Increase the drive capacity. Check the DC bus and install DC reactor(s). | |
| | | | Action Level | P06.00 (120V/230V series = 180VDC 460V series = 360VDC 575V series = 450VDC) | |
| | | | Action Time | Immediately act when the DC bus voltage is lower than P06.00 | |
| | | Low-voltage at stop (LvS) DC bus voltage is lower than P06.00 setting value at stop or a hardware failure in voltage detection had occurred. | Fault setting parameter | N/A | |
| Lu5 | 14 | | Reset method | Manual / Auto: 120V/230V series: Lv level + 30VDC + 500ms 460V series: Lv level + 60VDC + 500ms 575V series: Lv level + 75VDC + 500ms | |
| | | | Reset condition | 500 ms | |
| | | | Record Corrective Actions | Yes Improve power supply condition. Check if the power specification matches the drive. Adjust voltage to the power range of the drive. Cycle the power after checking the power. If LvS error still exists, return to the factory for repair. Check the power system. Increase the capacity of power equipment. Install DC reactor(s). | |
| | | Phase loss protection (orP) Phase loss of power input | Action Level | When DC bus ripple is higher than the protection level, and the output current exceeds 50% of the rated current, the drive starts counting. When the counting value reaches the upper limit, an orP error occurs. | |
| | | | Action Time | The action time varies with different output current. | |
| | | | Fault setting parameter Reset method | P06.53 Manual reset | |
| | | | Reset condition | Immediately reset when DC bus is higher than P07.00 | |
| | | | Record | Yes | |
| or P | 15 | | Corrective Actions | Yerify the wiring of the main circuit power is installed correctly. Check that a single-phase power supply is not being used with a three-phase model. Choose the model whose power matches the voltage. Power voltage changes can trigger this fault. If the main circuit power works normally, verify the main circuit. Cycle the power after checking the power, if orP error still exists, contact AutomationDirect Technical Support. Check for loose terminal wiring, tighten the terminal screws according to the torque described in the user manual. Verify the input cable is undamaged and replace if needed. Check for unbalanced three-phase input power. | |

| Fault Codes (continued) | | | | |
|---------------------------------|---|--|---|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| ∟H I | 16 | IGBT overheating (oH1) IGBT temperature exceeds the protection level. Protection level is model default of P06.15 + 5°C | Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions | Depending on the model power, model default of P06.15 +5°C. When the setting for P06.15 is higher than the oH1 level, oH1 error occurs instead of oH1 warning. An IGBT overheating error occurs, and the drive stops. Immediately when limit is reached. N/A Manual reset Reset only when IGBT temperature is lower than oH1 error level minus (-) 10°C Yes 1) Check the ambient temperature. 2) Regularly inspect the ventilation hole of the control cabinet. 3) Change the installed location if there are heating objects, such as braking resistors, in the surroundings. 4) Install/add cooling fan or air conditioner to lower the temperature inside the cabinet. 5) Check for and remove obstructions or replace the cooling fan. 6) Increase ventilation space of the drive. 7) Decrease loading. |
| | | | Action Level | 8) Decrease the carrier wave. 9) Replace the drive with higher capacity model. NTC broken or wiring failure When the IGBT temperature is higher than the protection level, and |
| £Н Io | 18 | IGBT temperature detection failure (tH1o) IGBT hardware failure in temperature detection | Fault setting parameter Reset method Reset condition Record Corrective | detection time exceeds 100 ms, the tH1o protection activates. N/A Manual reset Immediately reset Yes Wait for 10 minutes, and then cycle the power. Check if tH1o protection |
| □L 21 | Over load (oL) The AC motor drive detects excessive drive output current. Overload capacity: • Variable Torque (VT): Sustains for one | Actions Action Level Action Time Fault setting parameter Reset method Reset condition Record | still exists. If yes, contact AutomationDirect Technical Support. Based on overload curve and derating curve. When the load is higher than the protection level and exceeds allowable time, the oL protection activates. N/A Manual reset Reset in five seconds after the fault is cleared Yes | |
| | 21 | minute when the drive outputs 120% of the drive's rated output current. Sustains for three seconds when the drive outputs 150% of the drive's rated output current. Constant Torque | Corrective Actions | Reduce the load. Increase the setting value for P01.12–P01.19 (accel./decel. time) Adjust the settings for P01.01–P01.08 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). Refer to the V/F curve selection of P01.43. Replace the drive with a larger capacity model. If the oL only occurs during low-speed operations: a) Reduce the load during low-speed operations: b) Increase the drive capacity. c) Decrease the carrier frequency of P00.17. Adjust P07.26 Torque Compensation Gain until the output current reduces and the motor does not stall. Verify stall prevention is set to the proper value. Check the status of three-phase motor and verify the cable is not broken or screws are loose. Verify the parameter settings for speed tracking. a) Start the speed tracking function. b) Adjust the maximum current for P07.09 speed tracking. |
| | | output current | | |

| Fault Codes (continued) | | | | | |
|---------------------------------|--------|---|---|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, c | and Corrective Action | |
| EoL I | 22 | Electronics thermal relay 1 protection (EoL1) Electronics thermal relay 1 protection. The drive coasts to stop once it activates. | Action Level Action Time Fault setting parameter Reset method Reset condition Record | Start counting when the output current > 150% of the motor 1 rated current P06.14 (If the output current is larger than 105% of the motor 1 rated current again within 60 sec., the counting time reduces and is less than P06.14) N/A Manual reset Reset in five seconds after the fault is cleared Yes 1) Reduce the load. 2) Increase the setting value for P01.12–P01.19 (accel./decel. time) 3) Adjust the settings for P01.01–P01.08 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). Refer to the V/F curve selection of P01.43. 4) If the EoL1 only occurs during low-speed operations: a) Replaced the drive with a dedicated VFD model. b) Increase the motor capacity. 5) If using a VFD dedicated motor, verify P06.13=1: Standard motor (motor with fan on the shaft). 6) Verify motor rated frequency and reset if needed. 7) Verify motor rated frequency and reset if needed. 8) If using one drive to run multiple motors, set P06.13=2: Disable, and install thermal relay on each motor. 9) Set stall prevention to the proper value. 10) Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall. 11) Check the status of the fan, or replace the fan. | |
| EoL 2 | 23 | Electronic thermal relay 2 protection (EoL2) Electronic thermal relay 2 protection. The drive coasts to stop once it activates. | Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions | 12) Replace the motor. Start counting when the output current > 150% of the motor 2 rated current P06.28 (If the output current is larger than 105% of the motor 2 rated current again within 60 sec., the counting time reduces and is less than P06.28) N/A Manual reset Reset in five seconds after the fault is cleared Yes 1) Reduce the load. 2) Increase the setting value for P01.12–P01.19 (accel./decel. time) 3) Adjust the settings for P01.35–P01.42 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). Refer to the V/F curve selection of P01.43. 4) If the EoL2 only occurs during low-speed operations: a) Replaced the drive with a dedicated VFD model. b) Increase the motor capacity. 5) If using a VFD dedicated motor, verify P06.27=1: Standard motor (motor with fan on the shaft). 6) Verify motor rated current and reset if needed. 7) Verify motor rated frequency and reset if needed. 8) If using one drive to run multiple motors, set P06.27=2: Disable, and install thermal relay on each motor. 9) Set stall prevention to the proper value. 10) Adjust P07.71 torque compensation gain until the current reduces and the motor does not stall. 11) Check the status of the fan, or replace the fan. 12) Replace the motor. | |

| | | | Fault C | Codes (continued) |
|---------------------------------|--------|-------------------------------|-----------------------|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | | and Corrective Action |
| | | | Action Level | PTC input value > P06.30 setting (Default = 50%) |
| | | | Action Time | Immediately act |
| | | | | P06.29 setting is: |
| | | | Fault setting | 0: Warn and continue operation |
| | | | parameter | 1: Fault and ramp to stop |
| | | | 1 | 2: Fault and coast to stop |
| | | | | 3: No warning |
| | | | Reset method | When P06.29=0, oH3 is a "Warning". The "Warning" is automatically cleared. |
| | | | Reset method | |
| | | | Reset condition | When P06.29=1 or 2, oH3 is a "Fault". You must reset manually. Immediately reset |
| | | | Record | When P06.29=1 or 2, oH3 is a "Fault", and the fault is recorded. |
| | | | | 1) Check if motor is locked and remove the motor shaft lock. |
| | | | | 2) Verify load and decrease the loading or replace motor with a higher |
| | | Motor overheating | | capacity model if load is too high. |
| | | (oH3) PTC | | 3) Verify ambient temperature and change the installation location if |
| | | | | there are heating devices in the surroundings, or install/add cooling |
| | | Motor overheating | | fan or air conditioner to lower the ambient temperature. |
| oH3 | | (PTC) (P03.00–P03.01=6 | | 4) Check the cooling system and ensure it's working normally. |
| 0/10 | _ | PTC), when PTC | | 5) Verify the motor fan is working and replace the fan if needed. |
| | | input > P06.30, the | Corrective Actions | 6) Verify duration of low speed operation. |
| | | fault treatment acts | | a) Decrease low-speed operation time. |
| | | according to P06.29. | | b) Change to dedicated motor for the drive. |
| | | | | c) Increase the motor capacity. |
| | | | | 7) Verify accel/decel time and increase setting values for P01.12–P01.19 |
| | | | | (accel./ decel. time) if working cycle is too short. |
| | | | | 8) Verify V/F voltage and adjust settings for P01.01–P01.08 (V/F curve), |
| | | | | especially the setting value for the mid-point voltage (if the mid-poin |
| | | | | voltage is set too small, the load capacity decreases at low-speed). |
| | | | | 9) Verify the motor rated current matches the motor nameplate and |
| | | | | configure the correct rated current value of the motor if needed. |
| | | | | 10) Check the connection between PTC thermistor and the heat |
| | | | | protection. 11) Verify stall prevention is set correctly and adjust the value if needed. |
| | | | | 12) Check for unbalanced three-phase motor impedance. Replace the |
| | | | | motor if needed. |
| | | | | 13) Verify harmonics and reduce harmonics if too high. |
| I | | 1 | (contin | nued next page) |
| | | | leonui | iucu neni puye/ |

| isplay on | | | | Codes (continued) |
|-----------|--------|--|---|--|
| | ID No. | Fault Name and Description | | and Corrective Action |
| | | | Action Level | PT100 RTD input value > P06.57 setting (default = 7V) |
| | | | Action Time Fault setting parameter | Immediately act P06.29 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop |
| | | | Reset method | 3: No warning When P06.29=0 and the temperature < P06.56, oH3 is automatically cleared. |
| | | | | When P06.29=1 or 2, oH3 is a "Fault". You must reset manually. |
| | | | Reset condition Record | Immediately reset When P06.29=1 or 2, oH3 is a "Fault", and the fault is recorded. |
| оНЭ | 24_2 | Motor overheating (oH3) PT100 RTD Motor overheating (PT100) (P03.00– P03.01=11 PT100). When PT100 input > P06.57 (default = 7V), the fault treatment acts according to P06.29. | Corrective Actions | Check if motor is locked and remove the motor shaft lock. Verify load and decrease the loading or replace motor with a higher capacity model if load is too high. Verify ambient temperature and change the installation location if there are heating devices in the surroundings, or install/add cooling fan or air conditioner to lower the ambient temperature. Check the cooling system and ensure it's working normally. Verify the motor fan is working and replace the fan if needed. Verify duration of low speed operation. a) Decrease low-speed operation time. b) Change to dedicated motor for the drive. c) Increase the motor capacity. Verify V/F voltage and adjust settings for P01.01–P01.08 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). Verify the motor rated current matches the motor nameplate and configure the correct rated current value of the motor if needed. Check the connection of P1100 RTD. Verify stall prevention is set correctly and adjust the value if needed. Check for unbalanced three-phase motor impedance. Replace the motor if needed. Verify harmonics and reduce harmonics if too high. |
| | | | Action Level | P06.07 |
| | 26 | Over torque 1 (ot1) When the output current exceeds the over-torque detection level (P06.07) and exceeds over-torque detection time (P06.08), and when P06.06 or P06.09 is set to 2 or 4, the ot1 error displays. | Action Time Fault setting parameter | P06.08 P06.06 setting is: 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN When P06.06=1 or 3, ot1 is a "Warning". The warning is automatically |
| | | | Reset method Reset condition | cleared when the output current < ($Pr.06-07 - 5\%$) When P06.06=2 or 4, ot1 is a "Fault". You must reset manually. Immediately reset |
| | | | Record | When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. |
| ot 1 | | | Corrective Actions | Verify the settings for P06.07 and P06.08. Check for mechanical failure and remove any causes of malfunction. Reduce the load or replace the motor with a higher capacity model. Increase the setting values for P01.12–P01.19 (accel./decel. time) Adjust the V/F curve (Motor 1, P01.01–P01.08), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). If error occurs during low-speed operation: Decrease low-speed operation time. Increase the motor capacity. Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall. Very speed tracking settings and correct the parameter settings as |
| | | | | needed. a) Start the speed tracking function. b) Adjust the maximum current for P07.09 speed tracking. |

| Dicularyon | | | Fault | Codes (continued) |
|---------------------------------|--------|---|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| Reypuu | | | Action Level Action Time | P06.10 P06.11 |
| | | | Fault setting parameter | P06.09 setting is: 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN |
| | | Over torque 2 (ot2) | Reset method | When P06.09=1 or 3, ot2 is a "Warning". The warning is automatically cleared when the output current < (P06.10 – 5%). When P06.09=2 or 4, ot2 is a "Fault". You must reset manually. |
| | | When the output | Reset condition | Immediately reset |
| | | current exceeds the | Record | When P06.09=2 or 4, ot2 is a "Fault", and the fault is recorded. |
| o£2 | 27 | over-torque detection level (P06.10) and exceeds over-torque detection time (P06.11), and when P06.09 is set to 2 or 4, the ot2 error displays. | Corrective Actions | Verify the settings for P06.10 and P06.11. Check for mechanical failure and remove any causes of malfunction. Reduce the load or replace the motor with a higher capacity model. Increase the setting values for P01.12–P01.19 (accel./decel. time) Adjust the V/F curve (Motor 1, P01.35–P01.42), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). If error occurs during low-speed operation: Decrease low-speed operation time. Increase the motor capacity. Adjust P07.71 torque compensation gain until the current reduces and the motor does not stall. Very speed tracking settings and correct the parameter settings as needed. Start the speed tracking function. Adjust the maximum current for P07.09 speed tracking. |
| | | | Action Level | P06.71 |
| | 28 | Under current (uC) Low current detection | Action Time Fault setting parameter | P06.72 P06.73 setting is: 0: No function 1: Fault and coast to stop 2: Fault and ramp to stop by the 2nd deceleration time 3: Warn and continue operation |
| UΕ | | | Reset method | When P06.73=3, uC is a "Warning". The warning is automatically cleared when the output current > (P06.71+0.1A). When P06.73=1 or 2, uC is a "Fault". You must reset manually. |
| | | | Reset condition | Immediately reset |
| | | | Record Corrective Actions | When P06.71=1 or 2, uC is a "Fault", and the fault is recorded. 1) Confirm the motor cable is connected properly. 2) Verify settings of P06.71, P06.72, and P06.73 and set to correct values if needed. 3) Check if the load is too low and whether the motor capacity matches the load. |
| cF2 | 31 | EEPROM read error (cF2) Internal EEPROM cannot be read | Action Level Action Time Fault setting parameter Reset method | Firmware internal detection cF2 acts immediately when the drive detects the fault N/A Manual reset |
| | | | Reset condition Record Corrective Actions | Immediately reset Yes Press "RESET" key or reset the parameter to the default setting. If cF2 still occurs, contact AutomationDirect Technical Support. Cycle the power, if cF2 error still occurs, contact AutomationDirect Technical Support. |

| Fault Codes (continued) | | | | | |
|---------------------------------|--------|---|---------------------------------|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, c | and Corrective Action | |
| | | | Action Level Action Time | Hardware detection cd1 acts immediately when the drive detects the fault | |
| | | U-phase error (cd1) | Fault setting parameter | N/A | |
| cd l | 33 | U-phase current detection error when | Reset method Reset condition | Power-off N/A | |
| | | power is ON | Record | Yes | |
| | | | Corrective Actions | Cycle the power, if cd1 error still occurs, contact AutomationDirect Technical Support. | |
| | | | Action Level Action Time | Hardware detection cd2 acts immediately when the drive detects the fault | |
| | | V-phase error (cd2) | Warning setting parameter | N/A | |
| c d2 | 34 | V-phase current | Reset method | Power-off | |
| | | detection error when power ON | Reset condition Record | N/A Yes | |
| | | power ON | Corrective | Cycle the power, if cd2 error still occurs, contact AutomationDirect | |
| | | | Actions | Technical Support. | |
| | | | Action Level | Hardware detection | |
| | | W-phase error (cd3) | Action Time Warning setting | cd3 acts immediately when the drive detects the fault | |
|]] | 25 | M shace surrent | parameter | N/A | |
| cd3 | 35 | W-phase current detection error when | Reset method Reset condition | Power-off N/A | |
| | | power ON | Record | Yes | |
| | | | Corrective | Cycle the power, if cd3 error still occurs, contact AutomationDirect | |
| | | | Actions | Technical Support. | |
| | | cc hardware error (Hd0) cc (current clamp) hardware protection error when power is ON | Action Level Action Time | Hardware detection Hd0 acts immediately when the drive detects the fault | |
| | | | Fault setting | | |
| | | | parameter | N/A | |
| HdO | 36 | | Reset method | Power-off | |
| | | | Reset condition Record | N/A Yes | |
| | | | Corrective | Cycle the power, if Hd0 error still occurs, contact AutomationDirect | |
| | | | Actions | Technical Support. | |
| | | | Action Level Action Time | Hardware detection Hd1 acts immediately when the drive detects the fault | |
| | | oc bardware error (Hd1) | Fault setting | N/A | |
| | ~- | oc hardware error (Hd1) oc hardware protection error when power is ON | parameter | | |
| Hdl | 37 | | Reset method Reset condition | Power-off N/A | |
| | | | Record | Yes | |
| | | | Corrective | Cycle the power, if Hd1 error still occurs, contact AutomationDirect | |
| | | | Actions | Technical Support. | |
| | | | Action Level Action Time | Hardware detection Immediately act | |
| | | | Fault setting | | |
| | | | parameter | N/A | |
| | | | Reset method | Manual reset | |
| | | | Reset condition Record | Immediately reset Yes | |
| | | | Record | This error can occur if you press the STOP key during auto-tuning. | |
| RUE | | Auto-tuning error (AUE) | | Re-execute auto-tuning. | |
| | | | | 2) Check motor capacity and related parameters. | |
| | 40 | Motor auto-tuning | | a) Set the correct parameters P01.01–P01.02. | |
| | | error | | b) Set P01.00 larger than the motor rated frequency.3) Check the motor wiring. | |
| | | | Corrective | 4) Check for motor shaft lock and remove cause of lock if needed. | |
| | | | Actions | 5) Check for electromagnetic contactor at output (U/V/W) and make | |
| | | | | sure the electromagnetic valve is OFF. | |
| | | | | 6) Verify load. If too heavy:a) Reduce the load. | |
| | | | | b) Replace the motor with a larger capacity model. | |
| | | | | 7) Check if accel/decel time is too short, then increase the setting values | |
| | | | | for P01.12–P01.19 (accel./decel. time) if needed. | |
| | | | (contir | nued next page) | |

| GS20(x) Reypad D No. Patter Nome and Pecription Action, Reset, and Corrective Action Action, Reset, and Corrective Action Action, Reset, and Corrective Action Action Level When the analog input < 4 mA (only detects 4-20 mA analog Action Time PDD loss AI2 (AFE) PD feedback loss (analog feedback signal is only valid when the PID function is enabled) New PM Construction of the warning is automatically cleared. When P08.09 and AFE is a "Fault", You must reset manually detected and the warning is not recorded PDE 093 or 4. AFE is a "Fault", You must reset manually detected and the warning is not recorded PDE 093 or 4. AFE is a "Fault", You must reset manually detected and the warning is not recorded PDE 093 or 4. AFE is a "Fault", You must reset manually detected and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 093 or 4. AFE is a "Youring", and the warning is not recorded PDE 095 or rot on onde. When press "RUN" key, PGF2 fault coccurs. PG feedback total (PG F3) Action Level Action Time Immediately reset rocount the fault we recorder the motor frequency exceeds the encoder parameter NA PG F6 dipack stall (PG F3) PG feedback stall (PG F3) Fault and coast to stop PG F40.10.11 (PG F41) PG F6 all perror encode | 1 | Fault Codes (continued) | | | | | |
|--|---------|-------------------------|---|---|--|--|--|
| PIFE 41 PID loss AI2 (AFE) Fault setting parameter P08.09 setting is: 0. Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: VAmm and operate at last frequency. When P08.09 sor 4, AFE is a "Warning", when the feedback sol is only valid when the PID function is enabled PID feedback loss (analysis) Reset condition Men P08.09 sor 4, AFE is a "Fault", You must reset manually the PID function is enabled PG feedback loss (PGF2) Action Time Reset condition Men P08.09 sor 4, AFE is a "Fault", and the fault is recorded P08.09 sor 4, AFE is a "Warning", and the varning is not recorded P08.09 sor 4, AFE is a "Warning", and the varning is not recorded P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is not recorder P08.09 sor 4, AFE is a "Warning", and the varning is and the varning is automatically cordect. PG feedback loss (PGF2) Action Level Software detection Action Imme Immediately reset Corrective fault setting parameter Action Imme Immediately reset Reset encoder P10.10 PG feedback stall (PGF3) P10.12 setting is: P10.12 setting is: PG feedback stall (PGF4) Reset encoder parameters (P10.00 and P10.02) Action Immediately reset | | ID No. | | Action, Reset, a | and Corrective Action | | |
| PFE 41 PID feedback loss (analog feedback signal is only valid when the PID function is enabled) Reset method Reset condition mA, the "Warning" is automatically cleared. When PO8.09=1 or 2, AFE is a "Fault". You must reset manually dimediately reset PDFE 41 PG feedback loss (PGF2) Reset method mA, the "Warning" is automatically cleared. When PO8.09=1 or 2, AFE is a "Fault". You must reset manually dimediately reset PDFF2 43 PG feedback loss (PGF2) Action Level Action Level Software detection Actions PDFF2 43 PG feedback loss (PGF2) Action Level Software detection Fault setting parameter MA anual reset PDFF3 43 PG feedback stall (PGF3) Action Level Software detection Actions Manual reset PDFF3 44 P10.00 and P10.02 is not set in the PG control mode. When press "RUN" key, PGF2 fault occurs. Fault setting PAG feedback stall (PGF3) Manual reset PDFF3 44 PG feedback stall (PGF3) Fault setting P10.12 setting is: 0. Warn and continue operation parameter P10.10 P10.12 setting is: 0. Warn and continue operation parameter P10.11 P10.12 P10.13 Reset ASR parameters. Verify accel/decel times and reset if P10.13 Action Time P10.14 PDFF4 44 PG Sip error (PGF4) PG Sip error (PGF4) PG Sip error (PGF4) PG Sip error P10.13 | | | PID loss Al2 (AFE) | Action Time Fault setting | P08.09 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: Warn and operate at last frequency | | |
| PGF3 43 PG feedback loss (PGF2) PG feedback loss (PGF2) Action Level Fault setting parameter Check for feedback device failure and replace the device w one. PGF3 43 PG feedback loss (PGF2) Action Level Fault setting parameter Software detection Action Time Fault setting N/A P10.00 and P10.02 is not set in the PG control mode. When press "RUN" key, PGF2 fault occurs. Action Level Fault setting N/A PGF3 44 PG feedback stall (PGF3) PG feedback stall (PGF3) N/A PGF6 Under PG mode, when the motor frequency exceeds the encoder observer stall (P10.10) and starts to count, the fault time is longer than the detection time of encoder observer stall (P10.11), then PGF3 fault occurs. P10.12 setting is: Ocrective Action Time VWarn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop PGF4 45 PG slip error (PGF4) P10.13 Action Time P10.13 Action Time PGF4 45 PG slip error (PGF4) P10.14 P10.13 exet moder the output frequency and motor frequency is smaller than the motor frequency exceeds encoder | RFE | 41 | (analog feedback signal is only valid when the | Reset condition | mA, the "Warning" is automatically cleared. When P08.09=1 or 2, AFE is a "Fault". You must reset manually. | | |
| PGF2 43 P10.00 and P10.02 P10.00 and P10.02 fault setting press "RUN" key, PGF2 fault setting Action Time Immediately act Fault setting PVA PGF3 43 P10.00 and P10.02 fault occurs. Reset condition Immediately reset Reset condition PGF53 PG feedback stall (PGF3) PG feedback stall (PGF3) Action Level fault setting P10.10 P10.10 PGF4 PG feedback stall (PGF3) P10.10 Action Time P10.11 P10.12 setting is: 0: Warn and continue operation parameter 0: Warn and continue operation parameter PGF4 Ata PG feedback stall (PGF3) Fault setting parameter 0: Warn and continue operation parameter P10.10 P10.12 setting is: 0: Warn and continue operation parameter PGF4 PG slip error (PGF4) PG slip error (PGF4) PG slip error (PGF4) P10.13 P10.15 setting is: Fault setting parameter 1) Reset encoder parameters. Verify accel/decel times and reset if 4) Reset PG feedback stall values, P10.10 and P10.11. PG slip error (PGF4) P10.15 setting is: Fault setting parameter 1) Reset and const to stop 2: Fault and ramp to | | | | Actions | cable with a new one if needed. 2) Check for feedback device failure and replace the device with a new one. 3) Check all the wiring. If AFE fault still exists, contact AutomationDirect Technical Support. | | |
| PGF2 43 Fault setting parameter interest | | | | | | | |
| PGFY 45 PG slip error (PGFY) PG slip error (PGF4) PG slip error (PGF4) Reset condition Immediately reset Record Yes PGFFY 44 PG slip error (PGF4) PG slip error (PGF4) Reset condition Immediately reset Record Yes PGFFY 45 PG slip error (PGF4) Reset condition Immediately reset Record Yes PGFFY 45 PG slip error (PGF4) Reset method Action Level P10.12 P10.12 Reset not control mode is selected (P00.11=1). | 0053 | 12 | | Fault setting parameter | N/A | | |
| PGF4 44 PG set stall evel (PGF3) 1) Reset encoder parameters (P10.00 and P10.02) (2) Verify correct control mode is selected (P00.11=1). (PGF3) PG feedback stall (PGF3) PG feedback stall (PGF3) Action Level P10.10 Under PG mode, when the motor frequency exceeds the encoder observer stall level (P10.10) and starts to count, the fault time is longer than the detection time of encoder observer stall (P10.11), then PGF3 fault occurs. Fault setting P10.12 setting is: 0: Warn and continue operation parameter (P10.01) Corrective Altion Time P10.11 P10.12 setting is: 0: Warn and continue operation parameter (P10.01) P10.12 setting is: 0: Warn and continue operation parameter (P10.01) PGF4 Fault setting fire is longer than the detection time of encoder observer stall (P10.11), then PGF3 fault occurs. Reset method Manual reset (P10.01) PGF4 PG slip error (PGF4) PG slip error (PGF4) Action Level P10.13 P10.15 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast | PSFC | 43 | is not set in the PG control mode. When | Reset condition | Immediately reset | | |
| PGF3 Action Time P10.11 PGF3 Under PG mode, when the motor frequency exceeds the encoder observer stall level (P10.10) and starts to count, the fault stetting of encoder observer stall (P10.10) and starts to count, the fault stetting of encoder observer stall (P10.11), then PGF3 fault occurs. Reset method Manual reset Reset nethod Manual reset Reset necoder parameter (P10.01) Immediately reset Record Yes Yes Reset necthod Neset encoder parameter (P10.01) Immediately reset Record Yes Yes Action Time P10.13 Action Time P10.14 PGF4 PG slip error (PGF4) Under PG mode, when the motor frequency exceeds encoder Fault setting parameter PG Slip error (PGF4) Under PG mode, when the motor frequency exceeds encoder Vesceeds encoder Sest method Auto: When P10.15=0, PGF4 is a "Warning". When the deviation the output frequency and motor frequency is smaller than to observer slip range (010.13) and starts the output frequency and motor frequency is smaller than to observer slip range. | | | fault occurs. | Corrective Actions | Reset encoder parameters (P10.00 and P10.02) Verify correct control mode is selected (P00.11=1). | | |
| PGF4 45 PGF4 45 Reset condition Interdately reset PGF4 45 (P10.10) and starts to count, the fault time is longer than the detection time of encoder observer stall (P10.11), then PGF3 fault occurs. 1) Reset encoder parameter (P10.01) 2) Value for P01.00 may be too low, set a higher value. 3) Reset ASR parameters. Verify accel/decel times and reset if 4) 2) Value for P01.00 may be too low, set a higher value. 3) Reset ASR parameters. Verify accel/decel times and reset if 4) 4 Reset PG feedback stall values, P10.10 and P10.11. Action Level P10.13 Action Time P10.14 P10.15 setting is: 0: 9 Fault setting parameter 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 2) Value frequency and motor frequency is smaller than to observer slip range, the warning is automatically cleared. 45 (PGF4) is a "Fault" and you must r manaully. | 0053 | | (PGF3) Under PG mode, when the motor frequency exceeds the encoder observer stall level (P10.10) and starts to count, the fault time is longer than the detection time of encoder observer stall (P10.11), then PGF3 | Action Time Fault setting parameter | P10.11 P10.12 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop | | |
| PG slip error (PGF4) Under PG mode, when the motor frequency exceeds encoder observer slip range (PGF4) 45 Action Time P10.14 P10.15 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop Auto: When P10.15=0, PGF4 is a "Warning". When the deviation the output frequency and motor frequency is smaller than to observer slip range, the warning is automatically cleared. Manual: When P10.15=1 or 2, PGF4 is a "Fault" and you must re manaully. | P9F3 44 | 44 | | Record Corrective Actions | Yes Reset encoder parameter (P10.01) Value for P01.00 may be too low, set a higher value. Reset ASR parameters. Verify accel/decel times and reset if needed. Reset PG feedback stall values, P10.10 and P10.11. | | |
| PGF4 45 Under PG mode, when the motor frequency exceeds encoder observer slip range Reset method Auto: When P10.15=0, PGF4 is a "Warning". When the deviation the output frequency and motor frequency is smaller than to observer slip range, the warning is automatically cleared. Manual: When P10.15=1 or 2, PGF4 is a "Fault" and you must remanaully. | | | | Action Time Fault setting | P10.14 P10.15 setting is: 0: Warn and continue operation 1: Fault and ramp to stop | | |
| | P9F4 | 45 | Under PG mode, when the motor frequency exceeds encoder | | Auto: When P10.15=0, PGF4 is a "Warning". When the deviation between the output frequency and motor frequency is smaller than the encoder observer slip range, the warning is automatically cleared. Manual: When P10.15=1 or 2, PGF4 is a "Fault" and you must reset manaully. | | |
| Reset conditionImmediately resetto count, the fault time is longer than the detection time of encoder observer slip (P10.14), PGF4 fault occurs.Reset conditionImmediately reset1)Reset PG feedback parameters (P10.13 and P10.14) 2)2)Reset ASR parameters. Verify accel/decel times and reset if 3)3)Reset encoder parameters (P0.01).4)Verify torque limit and set new values if needed (P06.12, P11.17-P11.20)5)Check for and resolve any causes of motor shaft lock. | | | | Record Corrective | Immediately reset When P10.15=1 or 2, PGF4 is a "Fault" and the fault is recorded. 1) Reset PG feedback parameters (P10.13 and P10.14) 2) Reset ASR parameters. Verify accel/decel times and reset if needed. 3) Reset encoder parameters (P0.01). 4) Verify torque limit and set new values if needed (P06.12, P11.17-P11.20) 5) Check for and resolve any causes of motor shaft lock. 6) Check the mechanical brake has released correctly and verify the | | |

| Display on | | Fault Name and | | Codes (continued) |
|-------------------|--------|--|----------------------------|---|
| GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| | | | Action Level | When the analog input is < 4 mA (only detects 4–20 mA analog input) |
| | | | Action Time | Immediately act |
| | | | | P03.19 setting is: |
| | | | Facult anticas | 0: Disable |
| | | | Fault setting parameter | 1: Continue operation at the last frequency (warning, ANL is displayed on the keypad) |
| | | | parameter | 2: Decelerate to stop (warning, ANL is displayed on the keypad) |
| | | AI2 loss (ACE) | | 3: Stop immediately and display ACE |
| | | | | When P03.19=1 or 2, ACE is a "Warning". When analog input signal is > |
| AEE | 48 | Analog input loss | Reset method | mA, the warning is automatically cleared. |
| | | (including all the 4–20 | D (111 | When P03.19=3, ACE is a "Fault". You must reset manually. |
| | | mA analog signal) | Reset condition Record | Immediately reset When P03.19=3, ACE is a "Fault", and the fault is recorded. |
| | | | Record | 1) Check the Al2 feedback cable and tighten the terminal. Replace the |
| | | | | cable with a new one if needed. |
| | | | Corrective | 2) Check for external device failure and replace the device with a new |
| | | | Actions | one. |
| | | | | 3) Check all the wiring. If ACE fault still exists, contact AutomationDirec |
| | | | Action Level | Technical Support. DIx=10: External fault (EF) and the DI terminal is ON |
| | | | Action Time | Immediately act |
| | | External fault (EF) External fault. When the drive decelerates | | P07.20 setting is: |
| | | | | 0: Coast to stop |
| | | | Fault setting parameter | 1: Stop by the 1st deceleration time |
| | | | | 2: Stop by the 2nd deceleration time |
| | | | | 3: Stop by the 3rd deceleration time4: Stop by the 4th deceleration time |
| EF | 49 | | | 5: System deceleration |
| | | based on the setting | | 6: Automatic deceleration (P01.46) |
| | | of P07.20, the EF fault displays on the keypad. | Reset method | Manual reset |
| | | displays on the keypad. | Reset condition | Manual reset only after the external fault is cleared (terminal status is |
| | | | Record | recovered) Yes |
| | | | Corrective | |
| | | | Actions | Press RESET key after the fault is cleared. |
| | | Emergency stop (EF1) | Action Level | DIx=28: Emergency Stop (EF1) and the DI terminal is ON |
| | | | Action Time | Immediately act |
| | | When the contact | Fault setting parameter | N/A |
| | | of DIx=EF1 is ON, | Reset method | Manual reset |
| EFI | 50 | the output stops | | Manual reset only after the external fault is cleared (terminal status is |
| | | immediately and displays EF1 on the | Reset condition | recovered) |
| | | keypad. The motor is in | Record | Yes |
| | | free running. | Corrective Actions | Verify if the system is back to normal condition, and then press "RESET" |
| | | External base block (bb) | | key to go back to the default. Dlx=11: Base Block (BB) and the DI terminal is ON |
| | | | Action Time | Immediately act |
| | | When the contact | Fault setting | N/A |
| | | of DIx=bb is ON, | parameter | |
| 66 | 51 | the output stops | Reset method | The display "bb" is automatically cleared after the fault is cleared. |
| | | immediately and | Reset condition Record | N/A No |
| | | displays bb on the keypad. The motor is in | Corrective | Verify if the system is back to normal condition, and then press "RESET" |
| | | free running. | Actions | key to go back to the default. |
| | 1 | in de ranning. | | nued next page) |

| Dianlascon | | | Fault C | Codes (continued) |
|---------------------------------|--------|---|---------------------------------|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, a | and Corrective Action |
| | | | Action Level | Entering the wrong password three consecutive times |
| | | | Action Time | Immediately act |
| | | | Fault setting | N/A |
| | | Deserve and in the alternat | parameter | |
| | | Password is locked | Reset method | Manual reset Power-off |
| | | (Pcod) | Reset condition Record | Yes |
| Pcod | 52 | Entering the wrong password three consecutive times through P00.07 | Corrective Actions | Input the correct password after rebooting the motor drive. If you forget the password, do the following steps: a) Step 1: Input 9999 and press ENTER. b) Step 2: Repeat step 1. Input 9999 and press ENTER. (You need to finish step 1 and step 2 within 10 seconds. If you don't finish the two steps in 10 seconds, try again.) The parameter settings return to the default when the "Input 9999" process is finished. |
| | | | Action Level | When the function code is not 03, 06, 10, or 63. |
| | | | Action Time | Immediately act |
| | | | Fault setting | N/A |
| | | | parameter Reset method | |
| | | | Reset method Reset condition | Manual reset Immediately reset |
| | | Illegal command (CE1) Communication command is illegal | Record | No |
| EEI 5 | 54 | | Corrective Actions | Check if the communication command is correct. Verify the wiring and grounding of the communication circuit. It is recommended to separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. Check the cable and replace it if necessary. |
| | | | Action Level | When the data address is correct. |
| | | | Action Time | Immediately act |
| | | | Fault setting | N/A |
| | | | parameter Reset method | Manual reset |
| | | Illogal data addrocc | Reset condition | Immediately reset |
| | | Illegal data address (CE2) Data address is illegal | Record | No |
| CE2 55 | 55 | | Corrective Actions | Check if the communication command from the upper limit is correct Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. Check the cable and replace it if necessary. |
| | | | Action Level | When the data length is too long |
| | | | Action Time | Immediately act |
| | | | Fault setting | N/A |
| | | | parameter Reset method | Manual reset |
| CE3 | | | Reset condition | Immediately reset |
| | | Illegal data value (CE3) | Record | No |
| | 56 | 66 Data value is illegal | Corrective Actions | Check if the communication command from the upper limit is correct Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. |
| | | | | 4) Check the cable and replace it if necessary. |

| Fault Codes (continued) | | | | |
|---------------------------------|--------|---|----------------------------|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | | and Corrective Action |
| | | | Action Level | When the data is written to read-only address. |
| | | | Action Time | Immediately act |
| | | | Fault setting | N/A |
| | | | parameter | N/A |
| | | Data is written to read- | Reset method | Manual reset |
| | | only address (CE4) | Reset condition | Immediately reset |
| EEH | 57 | | Record | No |
| | 57 | Data is written to read- only address | Corrective Actions | Check if the communication command from the upper limit is correct. Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. Check the cable and replace it if necessary. |
| | | | A attack lawal | When the communication time exceeds the detection time for P09.03 |
| | | | Action Level | communication time-out. |
| | | | Action Time | P09.03 |
| | | Modbus transmission time-out (CE10) 3 | Fault setting parameter | P09.02 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop |
| | | | | 3: No warning, no fault, and continue operation |
| | | | Reset method | Manual reset |
| CE 10 | 58 | | Reset condition | Immediately reset |
| | | Modbus transmission | Record | Yes |
| | | time-out occurs | Corrective Actions | Check if the upper unit transmits the communication command within the setting time for P09.03. Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. Check if the setting for P09.04 is the same as the setting for the upper unit. Check the cable and replace it if necessary. |
| | | | | 1) ydc occurs when the confirmation signals of Y-connection and |
| | | | Action Level | Δ-connection are conducted at the same time. 2) If any of confirmation signals is not conducted within P05.25, ydc occurs. |
| | | | Action Time | P05.25 |
| | | Y-connection / ∆-connection switch | Fault setting parameter | N/A |
| Уdс | 61 | error (ydc) | Reset method | Manual reset |
| JUL | | An error occurs when Y-Δ switches | Reset condition | Can be reset only when the confirmation signal of Y-connection is conducted if it is Y-connection, or when the confirmation signal of Δ-connection is conducted if it is Δ-connection. |
| | | | Record | Yes |
| | | | Corrective Actions | Check if the electromagnetic valve works normally during switch. If not, replace it. Check if related parameters are all set up and set correctly. Check the wiring of the Y-Δ switch function. |
| | | | (contir | nued next page) |

| | | | Fault C | Codes (continued) |
|---------------------------------|--------|--|--|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, a | and Corrective Action |
| | | | Action Level | When P07.13 is not 0, and the DC bus voltage is lower than the level of dEb. |
| | | | Action Time | Immediately act |
| | | Deceleration energy | Fault setting | N/A |
| dЕЪ | 62 | backup error (dEb) When P07.13 is not 0, and the power is suddenly off, causing the DC bus voltage lower than the dEb action level, the dEb | parameter Reset method | When P07.13=2 (dEb with auto-acceleration / auto-deceleration, the drive outputs the frequency after the power is restored): dEb is automatically cleared. When P07.13=1 (dEb with auto-acceleration / auto-deceleration, the drive does not output the frequency after the power is restored): The drive stops when dEb acts and the rotation speed becomes 0 Hz, then the drive can be reset manually. |
| | | function acts and the motor ramps to stop. | Reset condition | Auto: The fault is automatically cleared. Manual: When the drive decelerates to 0 Hz. |
| | | Then dEb displays on | Record | Yes |
| | | the keypad. | Corrective Actions | Check that the power system is not unstable or off. If another large load operates in the same power system: a) Replace power system with a larger capacity model. b) Ensure the large load system is on a different power system. |
| | | Over alia error (SL) | Action Level | P07.29 100% of P07.29 = the maximum limit of the slip frequency (P10.29) |
| | | Over slip error (oSL) | Action Time | P07.30 |
| | | On the basis of the maximum slip limit set via P10.29, the speed deviation is abnormal. When the motor drive outputs at constant speed, F>H or F<h and="" exceeds="" exceeds<="" it="" level="" li="" p07.29,="" set="" the="" via=""> </h> | Fault setting parameter | P07.31 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning |
| oSL | 63 | | Reset method | P07.31=0 is a warning. When the motor drive outputs at constant speed, and F>H or F <h anymore,="" does="" exceed="" level="" not="" osl<br="" p07.29="" set="" the="" via="">warning will be cleared automatically. When P07.31=1 or 2, oSL is an error, and it needs to reset manually.</h> |
| | | the time set via P07.30, | Reset condition | Immediately reset |
| | | oSL shows. oSL occurs in induction motors only. | Record Corrective Actions | P07.31=1 or 2, oSL is "Fault", and the fault is recorded. 1) Verify the group 5 motor parameters. 2) Decrease the load 3) Check the setting of oSL protection function related parameters P07.29, P07.30, and P10.29 |
| | | | Action Level | Hardware detection |
| | | | Action Time Fault setting parameter | Immediately act N/A |
| _ | | STO Loss 1 (STL1) | Reset method | Hardware failure, and cannot reset. Cycle the power. |
| Srl I | 72 | STO1–SCM1 internal | Reset condition | N/A |
| | | loop detection error | Record Corrective Actions | Yes Verify the STO1 and SCM1 short circuit lines are connected. Re- connect the short circuit line if needed. Ensure all wiring is correct. Verify the connections at the drive control terminals. If issue still persists, contact AutomationDirect Technical Support. |
| | | | Action Level | Hardware detection |
| 5ro | 76 | STO (STo) Safety Torque Off function active | Action Time Fault setting parameter Reset method Reset condition Record | Immediately act N/A When P06.44=1 and after STo error is cleared, it automatically resets. When P06.44=0 and after STo error is cleared, reset it manually. Reset only after STo error is cleared. Yes 1) Reset the STO1/SCM1 and STO2/SCM2 switch (ON) and cycle the |
| | | | Corrective Actions | power. 2) Verify the connections at the drive control terminals. 3) If issue still persists, contact AutomationDirect Technical Support. |

| Display on Bosol(X) Keypad D No. Fault Name and Description Action, Reset, and Corrective Action 5rL2 77 STO Loss 2 (STL2) STO Loss 2 (STL2) Action Iewel Fault setting Fault setting op detection error Hardware detection Action Time Fault setting Parameter N/A 5rL3 78 STO Loss 3 (STL3) Reset condition Reset condition Action Time fault setting Parameter N/A 5rL3 78 STO Loss 3 (STL3) Action Time fault setting Parameter N/A 5rL3 78 STO Loss 3 (STL3) Action Iewel Action Time fault setting Parameter Hardware detection Action State SCM2 internal loop detection error Action Level Action Time fault setting Parameter Hardware detection N/A 5rL3 78 STO Loss 3 (STL3) Reset condition SCM2 internal loop detection error N/A 6cord Yes Yes Yes Yes Yes 79 U-phase over-current before run (Acc) Action Level Action L | | | | Fault C | Codes (continued) |
|---|---|----|-----------------------|------------------|---|
| SrL2 Tr Action Time Immediately act Fault setting parameter Immediately act N/A STO Loss 2 (STL2) STO2-SCM2 internal loop detection error Reset method Corrective Actions N/A STO Loss 3 (STL3) STO Loss 3 (STL3) Rest method Record N/A STO Loss 3 (STL3) STO Loss 3 (STL3) Action Level Action N/A STO Loss 3 (STL3) STO Loss 3 (STL3) Action Immediately act Action Immediately act N/A STO Loss 3 (STL3) STO1-SCM1 and STO2- SCM2 internal loop detection error Action Immediately act Action Immediately act N/A Reset method detection error Reset condition N/A N/A Reset method Record N/A STO1-SCM1 and STO2- SCM2 internal loop detection error Record Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit lines in feeded. Ensure all wring is correct. N/A N/A Record Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wring is correct. N/A Record Verify the rated current fault setting viring is correct. V-phase over-current before run (Aoc) Reset ondition Record N/A Record Verify the material method and remove causes of any short circuits, or replace the cable before turning and the UVW wring of the drive output terminal are correct. V-phase short | | | | Action, Reset, o | and Corrective Action |
| SrL2 77 STO Loss 2 (STL2) Fault setting parameter Reset method Hardware failure, and cannot reset. Cycle the power. Record N/A Record N/A Record Yes Corrective Actions 1) Verify the STO2 and SCM2 short circuit lines are connected. Record Insue parameter STO Loss 3 (STL3) STO Loss 3 (STL3) Action Level Hardware failure, and cannot reset. Cycle the power. STO Loss 3 (STL3) Action Level Hardware failure, and cannot reset. Cycle the power. Fault setting N/A STO Loss 3 (STL3) Reset method Hardware failure, and cannot reset. Cycle the power. Fault setting N/A Reset condition Reset condition STO Loss 3 (STL3) Reset method Hardware failure, and cannot reset. Cycle the power. Fault setting N/A Record Yes STO Loss 3 (STL3) Store control terminals. Yes STO Loss 3 (STL3) If the issue persists, contact AutomationDirect Technical Support. Verify the connections at the drive control terminals. Yes Corrective Action Time Immediately act Pault setting N/A | | | | | |
| SrL2 To Loss 2 (STL2) parameter anter anter and a cannot reset. Cycle the power. SrD2-SCM2 internal loop detection error Resert method Hardware failure, and cannot reset. Cycle the power. Record Yes Corrective Actions 2: 1) Verify the STO2 and SCM2 short circuit lines are connected. Record Yes 1) Verify the connections at the drive control terminals. STO Loss 3 (STL3) STO Loss 3 (STL3) The issue persists, contact AutomationDirect Technical Support. STO1-SCM1 and STO2-SCM2 internal loop detection error Action Time Immediately act Fault setting N/A Reset method Hardware failure, and cannot reset. Cycle the power. Reset method Hardware failure, and cannot reset. Cycle the power. Reset method Hardware failure, and cannot reset. Cycle the power. Record Yes Corrective Action Time Immediately act Action Time Action Time Immediately act Reset method Record Yes Corrective Action Time Immediately act Action Time Action Time Immediately act Record Yes U-phase over-current before run (Acc) Action Time Immediately act Fault setting parameter N/A Record Yes Yes Corrective Action Reset in five seconds after the fault clears Record Yes Ou-phase short circuit deter the add are ordere | | | | | Immediately act |
| SrL2 To Loss 2 (STL2) parameter failure, and cannot reset. Cycle the power. Reset econdition N/A STO2-SCM2 Internal loop detection error Record Yes Corrective Actions 1) Verify the STO2 and SCM2 shot circuit lines are connected. Re- connect the shot circuit line if needed. Ensure all wining is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. Action Level Hardware detection Action Internal Parameter N/A Reset econdition N/A Reset econdition N/A Reset econdition N/A Verify the connecti | | | | | N/A |
| SrL2 77 ST02-SCM2 internal loop detection error Reset condition N/A Reset condition N/A Record Yes Corrective Action Level 1) Werfy the ST02 and SCM2 short circuit lines are connected. Re- connect the short circuit line in medele. Ensure all wing is correct. 2/ Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. 3/ To Loss 3 (STL3) ST0 Loss 3 (STL3) Record N/A ST0 Loss 3 (STL3) ST0 Loss 3 (STL3) Record N/A ST0 Loss 3 (STL3) Record N/A Record ST0 Loss 3 (STL3) ST0 Loss 3 (STL3) Record N/A ST0 Loss 3 (STL3) Record N/A ST0 Loss 3 (STL3) Record N/A Record Yes N/A Reset condition N/A Record Yes Corrective Action Level Action Level 300% of the rated current Action Level 300% of the rated current Action Level MA Parameter Record Paul setting N/A Record Yes 10 U-phase short circuit Paul setting N/A Recor | | | STO Loss 2 (STL2) | | |
| First Side-Schild internal loop Record Yes 0 p detection error Corrective Actions 1) Verify the STO2 and SCM2 short circuit lines are connected. Reconnect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. 3) STO Loss 3 (STL3) Action Time Immediately act Reset condition 5rL3 78 STO1-SCM1 and STO2-SCM1 and STO2-SCM2 internal loop detection error Reset condition 6 STO1-SCM1 and STO2-SCM2 internal loop detection error Reset condition N/A 78 STO1-SCM1 and STO2-Record Reset condition N/A Record Yes Corrective Actions 2 Nerfy the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. 79 U-phase over-current before run (Aoc) Action Time Immediately act 9 U-phase short circuit detection risulation Reset in five seconds after the fault clears Record 79 U-phase short circuit detection run (Aoc) Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 79 U-phase short circuit detected when the output wiring detection run son insulation and the | E - 1 - 2 | 77 | | | |
| Roc 79 U-phase over-current before run (Aoc) U-phase short circuit dine for short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 10 STO Loss 3 (STL3) STO Loss 3 (STL3) Action Level Attion Level Hardware detection Action Time Immediately act Fault setting N/A Reset method Hardware failure, and cannot reset. Cycle the power. Reset condition N/A Reset condition N/A Reset condition N/A Reset condition N/A Record Yes Orrective 1) Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wriving is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. 3) If the issue persist, contact AutomationDirect Technical Support. 30% of the rated current Action Level N/A Reset condition Reset in five seconds after the fault clears Record Yes 10phase short circuit detection is performed before the drive condrol in the wring of the cortrol value with | סרוכ | // | STO2–SCM2 internal | | |
| F-L3 78 STO Loss 3 (STL3) Action Level Hardware detection STO Loss 3 (STL3) STO-Loss 3 (STL3) Action Time Immediately act Fault setting parameter N/A Record Yes Corrective Actions 1) Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connect the short circuit line if needed. Ensure all wiring of the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. Action Time Immediately act Fault setting N/A Reset condition Reset in five seconds after the fault clears Record Yes 1) U-phase short circuit detection is before turning of the control insulation va | | | loop detection error | Corrective | Verify the STO2 and SCM2 short circuit lines are connected. Re- connect the short circuit line if needed. Ensure all wiring is correct. Verify the connections at the drive control terminals. |
| Fact 3 78 STO Loss 3 (STL3) Fault setting parameter Reset condition N/A Reset condition N/A Reset condition N/A Record Yes 1) Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. Action Level 30% of the rated current Action Level 30% of the rated current Action Level MA Reset condition Reset condition Reset method Manual reset Record Yes 10-phase over-current before run (Aoc) Verify the motor is internal wiring on the power. 2) U-phase short circuit detected when the output wiring detection is performed before the drive runs. N/A Record Yes 1) Check if the motor is internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor current before run (Aoc) Corrective Actions 1) Check if the motor's internal wiring on the power. 3) Check the calbe before the drive runs. 1) Check if the motor is internal wiring on the courbul side (U/WW). 6) Check the length the motor calbe. If it's too long: a) Increase the AC motor dr | | | | Action Level | |
| STO Loss 3 (STL3) parameter ⁻ Reset method SCM2 internal loop detection error N/A Record 78 STO1-SCM1 and STO2- SCM2 internal loop detection error Record Yes Corrective Actions 1) Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. Action Level 300% of the rated current Action Imme Immediately act Fault setting parameter N/A Reset condition Reset in five seconds after the fault clears Record Yes U-phase over-current before run (Aoc) O Check if the motor's internal wiring and the UVW wiring of the drive output wiring detection is performed before the drive runs. N/A 79 U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions 6 Corrective Actions SC Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 9 U-phase short circuit detected when the output wiring detection is performed before the drive runs. SC Check the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/VW). 6) 0 The Ace may occur due to a short | | | | Action Time | Immediately act |
| FL3 78 STO Loss 3 (STL3) parameter Hardware failure, and cannot reset. Cycle the power. Reset method Hardware failure, and cannot reset. Cycle the power. Reset condition N/A SCM2 internal loop detection error Corrective Actions 'Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. J Verify the connections at the drive control terminals.) If the issue persists, contact AutomationDirect Technical Support. Action Level 300% of the rated current Action Time Immediately act Fault setting N/A Reset condition Reset or five seconds after the fault clears Record Yes 'Ves 'O check life the motor's internal wiring and the UVW wiring of the drive output terminal are correct. U-phase over-current before run (Aoc) U-phase short circuit detected when the output wiring detection is performed before the drive runs. 'O check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Gorrective Corrective 'O check the motor cable. If it's too long: a) Increase the AC motor drive's capacity. U-phase short circuit detected when the drive runs. 'O check the motor cable. If it's too long: a) Increase the AC motor drive's capacity. O the motor cable. | | | | Fault setting | N/A |
| 5rL3 78 STO1-SCM1 and STO2- SCM2 internal loop detection error Record Yes Corrective Actions 1) Verify the STO1 and SCM1 or STO2 and SCM2 short circuit lines are connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. Action Level 300% of the rated current Action Time Fault setting parameter N/A Record Yes V-phase over-current before run (Aoc) N/A U-phase short circuit detected when the output wiring detection is performed before the drive runs. I) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 1) Check the length of the control circuit and the wiring/grounding of the main circuit to grown insulation value with megger. Explace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent inteference.< | | | STO Loss 3 (STL3) | | |
| Figure 79 Stol = Sch and stole store and stole store and store an | | | | | |
| SCM2 internal loop detection error Image: Network Image: Network< | 5-17 | 78 | STO1–SCM1 and STO2– | | , |
| Pince 79 U-phase over-current before run (Aoc) Corrective Actions N/A Record Yes N/A Record Yes Check if the motor's internal wiring on the power. U-phase over-current before run (Aoc) Verify the conduct of the motor's internal wiring on the power. U-phase over-current before run (Aoc) Corrective Actions N/A Record Yes Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions 1 Ocheck the length of the contor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3 U-phase short circuit detected when the output wiring detection is performed before the drive runs. 1 Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the output side (U/V/W). Orrective Actions 1 Corrective Actions 3 Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. Distall AC reactor(s) on the output side (U/V/W). 6 The Acc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W. D) If shor | | | SCM2 internal loop | Record | |
| Action Time Immediately act Fault setting parameter N/A Reset method Manual reset Reset method Manual reset Reset method Reset in five seconds after the fault clears Record Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Acc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; b) If short circuit occurs, contact AutomationDirect Technical Support. | | | detection error | Actions | connected. Re-connect the short circuit line if needed. Ensure all wiring is correct. 2) Verify the connections at the drive control terminals. 3) If the issue persists, contact AutomationDirect Technical Support. |
| Roc 79 U-phase over-current before run (Aoc) Reset method Manual reset Record Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check if the motor's internal wiring on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). for the drive. Check for possible short circuits between terminals with an electric meter: | | | | | |
| Rec 79 U-phase over-current before run (Aoc) Reset ondition Reset in five seconds after the fault clears Record Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. U-phase over-current before run (Aoc) 1) Check if the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions Corrective Actions Corrective Actions 1) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. 1) Define the drive runs. 1) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; D) b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | Immediately act |
| Reset method Manual reset Reset condition Reset in five seconds after the fault clears Record Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check if the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). for the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | N/A |
| Recer Reset condition Reset in five seconds after the fault clears Record Yes U-phase over-current before run (Aoc) 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. U-phase short circuit detected when the output wiring detection is performed before the drive runs. 1) Check the motor cable before turning on the power. Corrective Actions Corrective Actions Corrective Actions 1) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/VW). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | Manual reset |
| Pocc 79 U-phase over-current before run (Aoc) Record Yes U-phase over-current before run (Aoc) 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | |
| Poc 79 U-phase over-current before run (Aoc) U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions Corrective Actions Corrective Actions Detect the length of the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check the motor insulation value with megger. Replace the motor if the insulation is poor. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). The Aoc may occur due to a short circuits between terminals with an electric meter: | | | II-phase over-current | | |
| Poc 79 before run (Aoc) U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions Corrective Actions Corrective Actions Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. Check the motor insulation value with megger. Replace the motor if the insulation is poor. Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: | | | | | output terminal are correct. |
| 79 U-phase short circuit detected when the output wiring detection is performed before the drive runs. Corrective Actions Corrective Actions | | | | | |
| 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: | Bec | 79 | | | 3) Check the motor insulation value with megger. Replace the motor if |
| butput wiring detection is performed before the drive runs. Corrective Actions Corrective Actions Increase the AC motor drive's capacity. Install AC reactor(s) on the output side (U/V/W). The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. If short circuit occurs, contact AutomationDirect Technical Support. | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | |
| drive runs. Actions a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | |
| a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | Corrective | 5) Check the length of the motor cable. If it's too long: |
| 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | Actions | |
| side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | |
| with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W; b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | |
| a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W; b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | |
| b) If short circuit occurs, contact AutomationDirect Technical Support. | | | | | a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; |
| | | | | | b) If short circuit occurs, contact AutomationDirect Technical |
| | | | | (contir | |

| | | | Fault C | Codes (continued) |
|---------------------------------|--------|---|--|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| <u>кеураа</u> | 80 | V-phase over-current before run (boc) V-phase short circuit detected when the output wiring detection is performed before the drive runs. | Action Level Action Time Fault setting parameter Reset method Reset condition Record | 300% of the rated current Immediately act N/A Manual reset Reset in five seconds after the fault clears Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. |
| | | | Action Level | b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. 300% of the rated current |
| COC | 81 | W-phase over-current before run (coc) W-phase short circuit detected when the output wiring detection is performed before the drive runs. | Action Time Fault setting parameter Reset method Reset condition Record | Immediately act N/A Manual reset Reset in five seconds after the fault clears Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive output terminal are correct. 2) Check the motor cable and remove causes of any short circuits, or replace the cable before turning on the power. 3) Check the motor insulation value with megger. Replace the motor if the insulation is poor. 4) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 5) Check the length of the motor cable. If it's too long: a) Increase the AC motor drive's capacity. b) Install AC reactor(s) on the output side (U/V/W). 6) The Aoc may occur due to a short circuit or ground fault at the output side of the drive. Check for possible short circuits between terminals with an electric meter: a) B1 corresponds to U, V and W; DC- corresponds to U, V and W; corresponds to U, V and W. b) If short circuit occurs, contact AutomationDirect Technical Support. |

| | | | Fault C | Codes (continued) |
|---------------------------------|--------|---|--|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| oPL I | | Output phase loss U phase (oPL1) U phase output phase loss | Action Level Action Time Fault setting parameter Reset method Reset condition Record | P06.47 P06.46 P06.48: Use the setting value of P06.48 first. If DC braking function activates, use that of P06.46. P06.45 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning Manual reset Immediately reset P06.45=1 or 2 is "Fault", and the fault is recorded. 1) Check for unbalanced three-phase motor impedance. If unbalanced, replace the motor. 2) Verify motor is wired correctly. Check the cable condition and replace |
| | | | Corrective Actions | the cable if necessary. Ensure a single-phase motor is not being used with a three-phase drive Check the flat cable of the control board. Re-do the wiring and test again if the flat cable is loose. If the fault still exists, contact AutomationDirect Technical Support. Verify that the three-phase current is balanced with a current clamp meter. If it is balanced and the oPL1 fault still exists, contact AutomationDirect Technical Support. Make sure the capacity of the drive and motor match each other. |
| | | Output phase loss | Action Level Action Time | P06.47 P06.46 P06.48: Use the setting value of P06.48 first. If DC braking function |
| | | | Fault setting parameter | activates, use that of P06.46. P06.45 setting is: 0: Warn and keep operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning |
| | | | Reset method | Manual reset |
| | | | Reset condition | Immediately reset |
| oPL2 | 83 | V phase (oPL2) V phase output phase loss | Record Corrective Actions | When P06.45=1 or 2, oPL2 is a "Fault", and the fault is recorded. 1) Check for unbalanced three-phase motor impedance. If unbalanced, replace the motor. 2) Verify motor is wired correctly. Check the cable condition and replace the cable if necessary. 3) Ensure a single-phase motor is not being used with a three-phase drive 4) Check the flat cable of the control board. Re-do the wiring and test again if the flat cable is loose. If the fault still exists, contact AutomationDirect Technical Support. 5) Verify that the three-phase current is balanced with a current clamp meter. If it is balanced and the oPL2 fault still exists, contact AutomationDirect Technical Support. 6) Make sure the capacity of the drive and motor match each other. |

| Fault Codes (continued) | | | | |
|---------------------------------|--------|---|--|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, a | and Corrective Action |
| | | | Action Level Action Time | P06.47 P06.46 P06.48: Use the setting value of P06.48 first. If DC braking function activates, use that of P06.46. |
| | | | Fault setting parameter | P06.45 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning |
| | | | Reset method | Manual reset |
| | | Output phase loss | Reset condition | Immediately reset |
| | | W phase (oPL3) | Record | When P06.45=1 or 2, oPL3 is a "Fault", and the fault is recorded. |
| oPL3 | 84 | W phase output phase loss | | Check for unbalanced three-phase motor impedance. If unbalanced, replace the motor. Verify motor is wired correctly. Check the cable condition and replace the cable if necessary. Ensure a single-phase motor is not being used with a three-phase |
| | | | Corrective Actions | drive 4) Check the flat cable of the control board. Re-do the wiring and test again if the flat cable is loose. If the fault still exists, contact AutomationDirect Technical Support. |
| | | | | Verify that the three-phase current is balanced with a current clamp meter. If it is balanced and the oPL3 fault still exists, contact AutomationDirect Technical Support. Make sure the capacity of the drive and motor match each other. |
| | | | Action Level | Software detection |
| | | Low frequency overload protection (oL3) | Action Time | Immediately act |
| | 87 | | Fault setting | N/A |
| | | | parameter | |
| | | | Reset method | Manual reset |
| . – | | | Reset condition | Immediately reset |
| oL3 | | | Record | Yes |
| | | Low frequency and high current protection | Corrective Actions | Enhance the heat dissipation capacity for the cabinet. Lower the carrier frequency (P00.17). Decrease the voltage settings that correspond to frequency below 15 Hz in the V/F curve. Set P00.11=0 (V/F, general control mode). Replace the drive with a higher power model. |
| | | | Action Level | Reset the software |
| | | | Action Time | Immediately act |
| | | Rotor position detection error (roPd) | Fault setting parameter | N/A |
| | | | Reset method | Manual reset |
| D 1 | 00 | | Reset condition | Immediately reset |
| roPd | 89 | Rotor position detection error protection | Record Corrective Actions | Yes Check the motor cable for damage and replace if needed. Check the motor coil, if damaged replace the motor. IGBT may be broken. If so, contact AutomationDirect Technical Support. Cycle the power. If roPd still occurs during operation, contact AutomationDirect Technical Support. |
| | | Ethernet Card Timeout | Action Level | Software detection |
| Cd 10 | 97 | (CD10) Ethernet communication has not been | Action Time Fault setting parameter Reset method Reset condition | Immediately act N/A Manual reset Immediate reset |
| | | received from the | Pacard | Vor |
| | | external controller (within the | Record | Yes 1) Initiate Ethernet communications from the master controller again. |
| | | Ethernet Timeout window). | Actions | 2) Disable checking for Ethernet Timeout in P9.94. anued next page) |

| | | | Fault C | Codes (continued) | |
|---------------------------------|--------|--|---------------------------------|---|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, c | and Corrective Action | |
| | | | Action Level | P09.31=-1 – -10 (there is no -9), when the internal communication between Slave and Master is abnormal, ictE fault occurs. | |
| | | | Action Time | Immediately act | |
| | | InrCOM time-out error | Fault setting parameter | N/A | |
| | | (ictE) | Reset method | Automatically reset after the internal communication is normal | |
| ictE | 111 | () | Reset condition | N/A | |
| | | Internal communication overtime error | Record Corrective Actions | Yes 1) Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the main circuit, or wire in 90 degree for effective anti-interference performance. 2) Verify the setting for P09.04 is the same as the setting for the upper unit. 3) Check the cable and replace it if necessary. | |
| | | | Action Level | Software detection | |
| | | | Action Time | Immediately act | |
| | | Internal communication | | N/A | |
| | | error (CP20) | parameter | | |
| CP20 | 121 | | Reset method | N/A | |
| | | Internal communication | Reset condition | N/A Yes | |
| | | time-out | Corrective | | |
| | | | Actions | Contact AutomationDirect Technical Support. | |
| | | | Action Level | Software detection | |
| | | | Action Time | Immediately act | |
| | | Internal communication | Fault setting | N/A | |
| | | error (CP22) Abnormal internal communication | parameter | | |
| CP22 | 123 | | Reset method | N/A | |
| | | | Reset condition | N/A | |
| | | | Record Corrective | Yes | |
| | | | Actions | Contact AutomationDirect Technical Support. | |
| | | | Action Level | Software detection | |
| | | | Action Time | Immediately act | |
| | | Internal communication | | N/A | |
| | | error (CP30) | parameter | | |
| CP30 | 124 | Abnormal internal | Reset method | N/A | |
| | | | Reset condition | N/A | |
| | | communication | Record Corrective | Yes | |
| | | | Actions | Contact AutomationDirect Technical Support. | |
| | | | Action Level | Software detection | |
| | | Internal communication | Action Time | Immediately act | |
| | | error (CP32) | parameter | N/A | |
| CP32 | 126 | | Reset method | N/A | |
| | | Abnormal internal | Reset condition | N/A | |
| | | communication | Record | Yes | |
| | | | Corrective Actions | Contact AutomationDirect Technical Support. | |
| | | | Action Level | Software detection | |
| | | | Action Time | Immediately act | |
| | | Internal communication | Fault setting | N/A | |
| | 107 | error (CP33) | parameter | | |
| CP33 | 127 | | Reset method | | |
| | | Abnormal internal communication | Reset condition Record | N/A Yes | |
| L | | | Corrective | | |
| | | | Actions | Contact AutomationDirect Technical Support. | |
| (continued next page) | | | | | |

| Display on | | | Fault C | odes (continued) |
|---------------------------------|----------|--|---|---|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, o | and Corrective Action |
| | | | Action Level | P14.75 |
| | | | Action Time Fault setting parameter | P14.76 P14.74 setting is: 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN |
| | | Over-torque 3 (ot3) | Reset method | When P14.74=1 or 3, ot3 is a "Warning". The warning is automatically cleared when the output current < P14.75. When P14.74=2 or 4, ot3 is a "Fault". You must reset manually. |
| | | When the output | Reset condition | Immediately reset |
| | | current exceeds the | Record | P14.74=2 or 4, ot3 is a "Fault", and the fault is recorded. |
| οĽЭ | ot 3 128 | over-torque detection | Corrective Actions | Configure the settings for P14.75 and P14.76 again. Check for mechanical error and remove the causes of malfunction. Verify load and decrease the loading or replace with a motor with larger capacity if load is too high. Verify accel/decel time and increase the setting values for P01.12– P01.19 (accel./ decel. time) if work cycle is too short. Verify V/F voltage and adjust the V/F curve (Motor 3, P01.54–P01.61), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). Replace motor with a larger capacity motor. Check for overload during low-speed operation and decrease the loading during low-speed operation or increase the motor capacity. Verify torque compensation and adjust P07.73 torque compensation gain until the output current decreases and the motor does not stall. Correct the parameter settings for speed tracking. Start the speed tracking function. Adjust the maximum current for P07.09 speed tracking. |
| | | | Action Level | P14.78 P14.79 |
| | | Over-torque 4 (ot4) When the output | Action Time Fault setting parameter | P14.77 setting is: 0: No function 1: Continue operation after over-torque detection during constant speed operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN 4: Stop after over-torque detection during RUN When P14.77=1 or 3, ot3 is a "Warning". The warning is automatically |
| | | | Reset method | cleared when the output current < P14.75. When P14.77=2 or 4, ot3 is a "Fault". You must reset manually. |
| | | | Reset condition | Immediately reset |
| o£4 | 129 | current exceeds the over-torque detection level (P14.78) and exceeds over-torque detection time (P14.79), and when P14.77 is set to 2 or 4, the ot4 error displays. | Record Corrective Actions | P14.77=2 or 4, ot3 is a "Fault", and the fault is recorded. 1) Configure the settings for P14.78 and P14.79 again. 2) Check for mechanical error and remove the causes of malfunction. 3) Verify load and decrease the loading or replace with a motor with larger capacity if load is too high. 4) Verify accel/decel time and increase the setting values for P01.12– P01.19 (accel./ decel. time) if work cycle is too short. 5) Verify V/F voltage and adjust the V/F curve (Motor 3, P01.63–P01.70), especially the setting value for the mid-point voltage (if the mid-point voltage is set too small, the load capacity decreases at low-speed). 6) Replace motor with a larger capacity motor. 7) Check for overload during low-speed operation and decrease the loading during low-speed operation or increase the motor capacity. 8) Verify torque compensation and adjust P07.75 torque compensation gain until the output current decreases and the motor does not stall. 9) Correct the parameter settings for speed tracking. Start the speed tracking function. Adjust the maximum current for P07.09 speed tracking. |

| Fault Codes (continued) Display on Fault Name and | | | | | | | |
|---|--------|---|--------------------------------------|--|--|--|--|
| GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, and Corrective Action | | | | |
| EoL 3 | | Internal communication error (EoL3) Electronic thermal relay 3 protection. The drive coasts to stop once it activates. | Action Level Action Time | Start counting when output current > 150% of the motor 3 rated current. P14.81 (If the output current is larger than 105% of the motor 3 rated current again within 60 sec., the counting time reduces and is less than P14.81) | | | |
| | | | Fault setting parameter | N/A | | | |
| | | | Reset method Reset condition | Manual reset Reset in five seconds after the fault is cleared | | | |
| | | | Record | Yes | | | |
| | | | Corrective Actions | Reduce the load. Increase the setting value for P01.12–P01.19 (accel./decel. time) Adjust the settings for P01.54–P01.61 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). Refer to the V/F curve selection of P01.43. If the EoL3 only occurs during low-speed operations: a) Replaced the drive with a dedicated VFD model. b) Increase the motor capacity. If using a VFD dedicated motor, verify P14.80=1: Standard motor (motor with fan on the shaft). Verify motor rated current and reset if needed. If using one drive to run multiple motors, set P14.80=2: Disable, and install thermal relay on each motor. Set stall prevention to the proper value. Adjust P07.73 torque compensation gain until the current reduces and the motor does not stall. Check the status of the fan, or replace the fan. Replace the motor. | | | |
| | 135 | | Action Level Action Time | Start counting when the output current > 150% of the motor 4 rated current. P14.83 (If the output current is larger than 105% of motor 4 rated current again within 60 sec., the counting time reduces and is less than P14.83) | | | |
| | | | Fault setting parameter | N/A | | | |
| | | | Reset method | Manual reset | | | |
| | | | Reset condition | Reset in five seconds after the fault is cleared | | | |
| EoL4 | | | Record Corrective Actions | Yes 1) Reduce the load. 2) Increase the setting value for P01.12–P01.19 (accel./decel. time) 3) Adjust the settings for P01.62–P01.70 (V/F curve), especially the setting value for the mid-point voltage (if the mid-point voltage is set too low, the load capacity decreases at low speed). Refer to the V/F curve selection of P01.43. 4) If the EoL4 only occurs during low-speed operations: a) Replaced the drive with a dedicated VFD model. b) Increase the motor capacity. 5) If using a VFD dedicated motor, verify P14.82=1: Standard motor (motor with fan on the shaft). 6) Verify motor rated current and reset if needed. 7) Verify motor rated frequency and reset if needed. 8) If using one drive to run multiple motors, set P14.82=2: Disable, and install thermal relay on each motor. 9) Set stall prevention to the proper value. 10) Adjust P07.75 torque compensation gain until the current reduces and the motor does not stall. 11) Check the status of the fan, or replace the fan. 12) Replace the motor. | | | |

| Fault Codes (continued) | | | | | | | |
|---|--------|--|--------------------------------------|---|--|--|--|
| Display on GS20(X) Keypad | ID No. | Fault Name and Description | Action, Reset, and Corrective Action | | | | |
| | | | Action Level | Hardware detection | | | |
| | 140 | oc hardware error (Hd6) GFF hardware protection error when power is ON. GFF occurs before run (b4GFF) The ground short circuit detected when the output wiring detection is performed before the drive runs. | Action Time | Immediately act when the fault is detected | | | |
| | | | parameter | N/A | | | |
| Hd6 | | | Reset method | Power-off | | | |
| ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | Reset condition | | | | |
| | | | Record | Yes | | | |
| | | | Corrective | Cycle the power. | | | |
| | | | Actions Action Level | If Hd6 still exists, contact AutomationDirect Technical Support. 250% of the rated current | | | |
| | | | Action Time | Immediately act | | | |
| | | | Fault setting | | | | |
| | | | parameter | N/A | | | |
| | | | Reset method | Manual reset | | | |
| | | | Reset condition | Reset in five seconds after the fault is cleared | | | |
| 649FF | | | Record | Yes 1) Check if the motor's internal wiring and the UVW wiring of the drive | | | |
| | | | | output terminal are correct. | | | |
| | | | Corrective | 2) Check the motor cable and remove causes of any short circuits, or | | | |
| | | | Actions | replace the cable before turning on the power. | | | |
| | | | | 3) Check the motor insulation value with megger. Replace the motor if | | | |
| | | | | the insulation is poor. | | | |
| | | Auto-tune error 1 (AuE1) No feedback current error when the motor parameter automatically detects | Action Level Action Time | Software detection Immediately act | | | |
| | | | Fault setting | | | | |
| | | | parameter | N/A | | | |
| AUE I | 142 | | Reset method | Manual reset | | | |
| | 142 | | Reset condition | Immediately reset | | | |
| | | | Record | Yes 1) Verify the motor is wired correctly. | | | |
| | | | Corrective | If a contactor is used as an open state on the output side of the drive | | | |
| | | | Actions | (U/V/W), check if the contactor coil is closed. | | | |
| | | | Action Level | Software detection | | | |
| | 143 | Auto-tune error 2 (AuE2) | Action Time | Immediately act | | | |
| | | | Fault setting parameter | N/A | | | |
| | | | Reset method | Manual reset | | | |
| AUE2 | | | Reset condition | Immediately reset | | | |
| писс | | | Record | Yes | | | |
| | | | | Verify that the motor is wired correctly and no wires are broken. Confirm that the motor works normally outside of auto-tuning. | | | |
| | | | Corrective | 2) Confirm that the motor works normally outside of auto-tuning.3) If an electromagnetic contactor is used as an open state on the | | | |
| | | | Actions | output side of the drive (U/V/W), verify that the three phases of the | | | |
| | | | | electromagnetic valve are all closed. | | | |
| | 144 | Auto-tune error 3 (AuE3) No load current I_0 measurement error when the motor parameter automatically detects. | Action Level | Software detection | | | |
| | | | Action Time Fault setting | Immediately act | | | |
| | | | parameter | N/A | | | |
| AUE3 | | | Reset method | Manual reset | | | |
| | | | Reset condition | Immediately reset | | | |
| | | | Record | Yes | | | |
| | | | Corrective Actions | Check the settings for P05.01 / P05.13 / P05.34. Confirm that the motor works normally outside of auto-tuning. | | | |
| | 149 | Auto-tune error 5 (AuE5) The rotor resistance | Actions Action Level | 2) Confirm that the motor works normally outside of auto-tuning. | | | |
| RUES | | | Action Time | Immediately act | | | |
| | | | Fault setting | N/A | | | |
| | | | parameter | | | | |
| | | | Reset method | Manual reset | | | |
| | | | Reset condition Record | Immediate reset Yes | | | |
| | | | | Verify that the motor is wired correctly and no wires are broken. | | | |
| | | | Corrective Actions | 2) Confirm that the motor works normally outside of auto-tuning. | | | |
| | | | | Possibly test with standard across-the-line starter." | | | |

TYPICAL AC DRIVE PROBLEMS AND SOLUTIONS

GREASE AND DIRT PROBLEMS

In those industries where grease and dirt are common. Please be aware of the possible damage that grease, oil, and dirt, may cause to your GS20(X) drive:

- 1) Electronic components that silt up with greasy oil may cause the drive to burn out or even explode.
- 2) Most greasy dirt contains corrosive substances that may damage the drive.

Solution:

Install the GS20(X) drive in a suitable enclosure to protect it from grease and dirt. Clean and remove grease and dirt regularly to prevent damage of the drive.





FIBER DUST PROBLEM

Problems related to fiber dust are typical in the textile industry. Please be aware of the possible damage that fiber dust may cause to your GS20(X) drive:

- 1) Fiber dust that accumulates or adheres to the fans will result in poor ventilation and cause overheating problems.
- 2) Textile plant environments with high humidity levels may experience GS20(X) drive failure or damage as a result of wet fiber dust adhering to components within the drive.

Solution:

Install the GS20(X) drive in a suitable enclosure to protect it from fiber dust. Clean and remove fiber dust regularly to prevent damage to the drive.







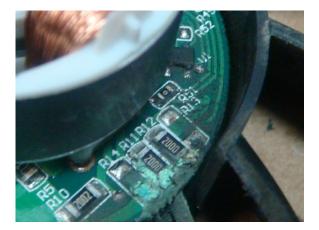
CORROSION PROBLEM

Corrosion problems may occur if any fluids or liquid in vapor form flows into the GS20(X) drive. Please be aware of the damage that corrosion may cause to your drive.

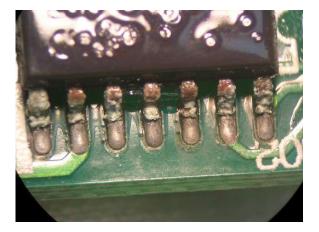
• Corrosion of internal components may cause the GS20(X) drive to malfunction and possibly explode.

Solution:

Install the GS20(X) drive in a suitable enclosure to protect it from fluids. Clean the drive regularly to prevent corrosion.







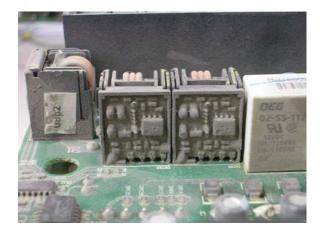
INDUSTRIAL DUST PROBLEM

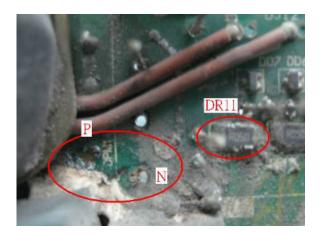
Serious industrial dust pollution frequently occurs in stone processing plants, flour mills, cement plants, and so on. Please be particularly aware of any metal dust, filings or if metalized vapor is present as these may cause damage to your drives:

- 1) Dust accumulating on electronic components may cause overheating problems and shorten the service life of the drive.
- 2) Conductive dust may damage the circuit board and may cause the drive to explode.

Solution:

Install the GS20(X) drive in a suitable enclosure and protect it from dust. Clean the cabinet and ventilation filter regularly for good ventilation.





WIRING AND INSTALLATION PROBLEM

When wiring the GS20(X) drive, the most common problems are connection to the wrong terminal or poor wiring practice. Please be aware of the possible damage that poor wiring practice may cause to your GS20(X) drive:

- 1) Screw terminals where the wire is not fully inserted or the terminal screw is not adequately tightened may result in sparking or high temperature due to a high resistance connection.
- 2) If circuit boards in the GS20(X) drive have been modified, components on the affected boards may have been damaged.

Solution:

Inspect all power and control terminal connections in the GS20(X) drive to ensure adequate wire insertion. Do not attempt to disassemble or repair control boards in the GS20(X) drive.







DIGITAL INPUT/OUTPUT TERMINAL PROBLEMS

Problems with digital I/O are usually the result of improper termination, or failure to segregate control wiring from power wiring. This may result in errant signals due to induced voltage, capacitive coupling or electrical noise. Incorrect voltage levels applied to the digital I/O terminals can damage the I/O circuitry of the drive.

• Input/Output circuit may burn out when the terminal usage exceeds its limit.

Solution:

Refer to the user manual for multi-function input output terminals usage and follow the specified voltage and current. DO NOT exceed the specification limits.

