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 GS30 drive in its optimal condition, and to ensure a long life. We recommend that a qualified technician perform a regular inspection of the GS30 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 is 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 GS30 drive and make sure the voltage is within the operating range.

ANNUAL INSPECTION

Check the following items once annually.

- 1) Check the torque of the GS30 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 GS30 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.
- ☑ 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

		Maintenance Perio		
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

		Maintenance Period			
Check Items	Methods and Criteria	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 Perio			
		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	enance	Period
Check Items	Methods and Criteria		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

		Mainte	Period	
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 GS30 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.



Warning Codes								
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res	et	Co	rrective Action		
n/a	0	No error	n/a	n/a	n/a			
			Action Level 06	When the function code is 03, 06, 10, and 63 Immediately act	1)	Check if the communication command is correct Verify the wiring and grounding of		
		Communication error	Warning setting parameter	N/A		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		unit.		
			Record	N/A	4)	necessary.		
		Communication error 2 (CE2) 2 RS-485 Modbus illegal data address	Action Level	When the input data address is incorrect	1)	Check if the communication command is correct. Verify the wiring and grounding of the communication circuit. Separate the communication circuit from the		
			Action Time	Immediately act	2)			
			Warning setting parameter	N/A				
CE2	2		RS-485 Modbus illegal	RS-485 Modbus illegal	Reset method	"Warning" occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct data address.	for pe 3) Ch	
			Reset condition	Immediately reset		same as the setting for the upper 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) 3 RS-485 Modbus illegal data value	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)				

EE I/D 5 Communication error 4 (CE4) Warning setting parameter N/A He communication circuit. Fr Warning "occurs when P09.02-0 and the motor drive keeps running. The drive resets automatically when receiving the correct written adfress of communication data. 0 2 5 Reset method Reset method N/A 0 Reset condition Immediately reset 0 0 0 Action Time Action Level When the communication drata. 0 0 P09.03 Communication circuit. S 0 0 0 Communication error 10 (CE10) Action Time N/A 0 0 Save error 1 (SE1) Reset method Reset method Warning "occurs when evec address of count 0 0 Save error 1 (SE1) Save error 1 (SE1) Reset method N/A 0 0 Save error 1 (SE1) Save error 1 (SE1) Reset condition N/A 0 0 Save error 1 (SE1) Keypad COPY error 1: Keypad COPY error 1: Keypad COPY error 1: Keypad COPY error 2: parameter Action Level Action Level Maring setting parameter N/A Save error 2 (SE2) 8 Save error 2 (SE2) Action Level Maring setting parameter N/A 0 Check the cable and replace necessary. N/A 0				Warning	Codes (continued)	
EE /I 4 Action Time Immediately act (C4) - communication error 4 (C54) - communication error 4 (C54) - communication error 4 (C54) - communication error 99.02 = 0 and the motor drive keeps running. The drive reset automatically when receiving the correct written address of communication data. - communication error 10 (C50) - concet the error 10 (C50) - concet the error	on GS30	ID No.		Action and Res	et	Corrective Action
EE II 4 Communication error 4 (CE4) Warning setting parameter N/A He communication circuit 5r P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct written address He communication circuit 5r P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct written address Oheck the cable and replace performance. Immediately reset Action Time When the communication time exceeds the detection time of P09.03 communication time exceeds the detection time of P09.03 communication circuit 5r Oheck the cable and replace necessary. Immediately reset Action Time N/A Oheck the cable and replace necessary. Immediately reset Action Time N/A Immediately reset N/A Oheck the cable and replace necessary. Immediately reset N/A Set error 1 (SE1)				Action Level		,
EE II 4 RS-485 Modbus data is written to read-only address Reset method Warning* occurs when the correct written address of communication data. Seet method				Action Time	Immediately act	2) Verify the wiring and grounding of
EEY 4 RS-485 Modbus data is written to read-only address Reset method Warning occurs when post-20 and the motor drive keeps running. The drive resets automatically when receiving the correct writhen address of communication drive Record 3 Check if the setting for P09.0 same as the setting for P09.0 same					N/A	the communication circuit. Separate the communication circuit from the
EE Image: Save error 1 (SE1) Save error 1 (SE1) Action Level N/A The causes of error are most to the drive. SEE 1 7 Save error 1 (SE1) Action Time N/A Save error 2 (SE2) Action Time N/A SEE 2 8 Save error 2 (SE2) Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time N/A Save error 2 (SE2) Save error 2 (SE2) 8 Save error 2 (SE2) Action Time	СЕЧ	4	RS-485 Modbus data is written to read-only		P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the correct written address of communication data.	3) Check if the setting for P09.04 is the same as the setting for the upper unit.
E ID 5 Communication error 10 (CE10) Action Level When the communication time exceeds the detection time of P09.03 1) Check if the upper unit transformation ormand with exceeds the detection time of the communication communication cruit is recommunication cruit is recommended to separate communication cruit is recommended to separate communication packet. 5 Save error 1 (SE1) Reset method "SE1" warning occurs when the GS4-KPD optional keypaid and control backet. 3) Check if the upper unit transformation cruit is recommunication cruit is recommended to separate communication cruit from the main circuit, or wire in 90 defor effective anti-interference performance. 5 8 Save error 1 (SE1) Reset condition "SE1" warning occurs when the GS4-KPD optional keypaid and control board. Poten the GS4-KPD optional keypaid and control board. Poten the drive gain in 10 ms at the time you copy the parameters to the drive. SE1: The causes of error are most ormunication interference and the unacceptab communication interference and the corporing keypaid and control board. Poten the drive again in 10 ms the drive again in 10 ms the error opting corr and the drive again in 10 ms the drive. SE1: The causes of error are most or the drive again in 10 ms the error opting corr or cours random or only occurs when copying cerror 2 (SE2) 5E 1 7 Save error 2 (SE2) Action Time N/A SE2: In this stage, the coo						
EEID 5 Communication error 10 (CE10) Warning setting parameter N/A is recommended to separate communication circuit from t monication oricuit from t monication oricuit monication problems between keypad and control board. Poten command to the drive, and does not transmit any data to the drive. 3) Check if the setting for P09.0 same as the setting for the u unit. 4) Check the cable and replace necessary. Seve error 1 (SE1) Keypad COPY error 1: Keypad copy time-out Action Time N/A N/A 51: The causes of error are mos communication copying cer- to the drive. 52: In this stage, the copy of the neror occurs random or only occurs when copying cer- parameters to the drive. Figure as the error ples fly ou cannot clear the error, ples contact AutomationDirect Techni Support. SEE 8 Save error 2 (SE2) Keypad COPY error 2: parameter writing error Action Time N/A N/A SE2: In this stage, the copied dat writing the parameters incorrectly a					When the communication time exceeds the detection time of P09.03 communication time-	1) Check if the upper unit transmits the communication command within the
5 10 (CE10) parameter IV/A communication circuit from the minicip occurs when P09.02=0 and the motor drive keeps running. The drive resets automatically when receiving the next communication packet. communication circuit, or wire in 90 degree for effective anti-interference automatically when receiving the next communication packet. communication circuit from the minicip occurs when performance. communication circuit from the minicip occurs when the GS4-KPD optional keypad does not transmit the COPY command to the drive, and does not transmit the COPY command to the drive, and does not transmit any data to the drive. SE1: The causes of error are most communication problems betwee keypad and control board. Poten the GS4-KPD optional keypad does not transmit the COPY command to the drive, and does not transmit any data to the drive. SE1: The causes of error are most communication problems betwee keypad and control board. Poten the drive again in 10 ms at the time you copy the parameters to the drive. SE1: The causes of error are most communication sinterference and the unacceptab communication command to the time you copy the parameters. 55: 1 7 Keypad COPY error 1: Keypad copy time-out 1 Action Time N/A SE1: The causes of error are most communication circuit from the minicip occurs when optional keypad copy time-out 10 ms Secord N/A Action Time N/A SE1: The causes of error are most communication circuit for the drive. SE1: The causes of error are most communication circuit for the drive. Secord N/A Action Time N/A SE2: In this s					P09.03	of the communication circuit. It
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5E1 7 Record N/A 4) Check the cable and replace necessary. Save error 1 (SE1) 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 ime you copy the parameters to the drive. Save error 1 (SE1) Keypad COPY error 1: Keypad copy time-out Action Time 10 ms Marning setting parameter N/A Save error 2 (SE2) Marning setting parameters to the drive. Save error 2 (SE2) 8 Save error 2 (SE2) Action Level Action Level Action Time N/A SE2: In this stage, the copied dat been transmitted to the Slave. The Slave compares and process copied data, and then saves the or the drive with old firmware version with added parameters to the drive with old firmware version with added parameters to the drive with old firmware version. SE2: In this stage, the copied dat been transmitted to the Slave. The Slave compares and process copied data, and then saves the or the Data ROM. During the procedute areample, you copy the new firmware version with added parameters to the drive with old firmware version. Save error 2 (SE2) 8 Save error 2 (SE2) N/A SE2: In this stage, the copied data cannot be copied data and then saves the origon with added parameters to the drive with old firmware version. SE2: In this stage. The Slave compares and process copied data, and then saves the ore Slave compares and process copied data, an				Reset condition		
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Second	5E I	7			"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	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,
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5E2 8 Reset method Manual reset (or cycle power) Reset condition If you cannot clear the error, pleat contact AutomationDirect Technic Support. Save error 2 (SE2) 8 Save error 2 (SE2) Action Level				Warning setting	N/A	upper right corner of the copy page).
Save error 2 (SE2) Save error 2 (SE2) Action Level Action Level Action Level Action Level Action Level Contact Automation Direct feature Save error 2 (SE2) Keypad COPY error 2: parameter writing error Action Time N/A Save error 2 (SE2) Action Time N/A				Reset method	Manual reset (or cycle power)	
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5E28Save error 2 (SE2)Action Levelwriting the parameters incorrectly at the time you copy parameters to the drive. For example, you copy the new firmware version with added parameters to the drive with old firmware version.been transmitted to the Slave. The Slave compares and process copied data, and then saves the data error (should be attribution may occur, or the data cannot be to EEPROM. At this time, the war occurs.8Keypad COPY error 2: parameter writing errorAction TimeN/AOccurs.VAWarning settingN/ACheck the status of Data ROM ar				Record		
parameter writing error Action Time N/A occurs. Warning setting N/A Check the status of Data ROM ar	562	8		Action Level	writing the parameters incorrectly at the time you copy parameters to the drive. For example, you copy the new firmware version with added parameters to the drive with	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 to EEPROM. At this time, the warning
			parameter writing error		N/A	4
				Warning setting	N/A	Check the status of Data ROM and remove the error causes first.
Reset method Manual reset (or cycle power) If you cannot clear the error, plea				Reset method Reset condition	Immediately reset	If you cannot clear the error, please contact AutomationDirect Technical
(continued next page)		1	1		,	1

Chapter 6: Maintenance and Troubleshooting

	_		Warning	Codes (continued)		
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res	et	Со	rrective Action
			Action Level	P06.15	1)	Check the ambient temperature.
		IGBT over-heating warning (oH1) The AC motor	Action Time	"oH1" warning occurs when IGBT temperature is higher than P06.15 setting value.		Regularly inspect the ventilation hole of the control cabinet. Change the installed location if there are heating objects, such as braking
		drive detects IGBT overheating and	Warning setting parameter	N/A	4)	resistors, in the surroundings. Install/add cooling fan or air
оHI	9	exceeds the protection level of oH1 warning. (When P06.15 is higher than the IGBT	Reset method	Auto-reset	5)	conditioner to lower the temperature inside the cabinet. Check for and remove obstructions or replace the cooling fan.
		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.
			Action Level	When the analog input is lower than 4 mA (only detects analog input 4–20 mA) P08.08		
		PID feedback error	Warning setting parameter	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	1)	Check the PID feedback wiring and
Pi d	(PID) 11 PID feedback loss (warning for analog feedback signal; works only when PID enables;	11Auto: "Warning" occurs2)11PID feedback losswhen P08.09=0 or 3. The3)(warning for analog"Warning" automatically4)	3)	tighten the terminals. Replace the cable. Replace the feedback device. If the PID error still occurs after checking all the wiring, contact AutomationDirect Technical Support		
			Reset condition	Immediately reset		
		Record	Records when P08.09=1 or 2 ("Error"). Does not record when P08.09=3 ("Warning").			
			(contii	nued next page)		

Warning Codes (continued)								
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res	et	Со	rrective Action		
			Action Level	When the analog input is lower than 4 mA (only detects analog input 4–20 mA)				
AnL	12	Al2 analog signal loss (AnL) Analog input current	Action Time Warning setting parameter	Immediately act P03.19 setting is: 0: Disable 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"		Check the Al2 wiring and tighten the terminals. Replace the cable. Replace the external device.		
		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. 	4)	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	P06.71	-			
					Action Time Warning 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	1)	Check for a broken motor cable, then
UC	13	Under current (uC) Low current	Reset method	 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 Does not record when				
			Record	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		
_504	17	Over speed warning (oSPd)	Warning setting parameter	P10.12=0 0: Warn and continue operation	2	speed control and increase the bandwidth setting if needed.		
oSPd	17	Over speed warning	Reset method	"Warning" automatically clears when the drive stops	3)	parameter tuning. Verify the wiring of the control circuit, and the wiring/grounding of the main circuit to prevent		
			Reset condition	"Warning" automatically clears when the drive stops	4)			
				N/A		interference.		

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			Warning	Codes (continued)		
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res		Corrective Action	
			Action Level	P10.13	1) Verify parameter setting for slip	
			Action Time	P10.14	error and reset value for P10.13 an	
		Deviation Warning	Warning setting parameter	P10.15 Encoder Stall and Slip Error Action =0 0: Warn and continue operation	 P10.14 if needed. 2) Reset ASR parameters and set propaccel./ decel. time. 3) Verify motor status and remove an causes if the motor is locked. 	
dRuE	18	(dAvE) Over speed deviation warning	Reset method	"Warning" automatically clears when the drive stops	 4) Check status of the mechanical bra and verify the action timing of the system if the brake is not released. 5) 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 circui 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	main circuit is broken. Cycle the	
PHL	PHL 19	(PHL) 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 1 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 broker Make sure the wiring is correct. Replace the broken part of the cab 	
		Record	N/A	 6) Verify the three-phase power is no unbalanced. 		
			(conti	nued next page)		

			Warning	y Codes (continued)	
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res		Corrective Action
			Action Level Action Time	P06.07 P06.08	1) Configure the settings for P06.07 and P06.08 again.
ot 1	20	Over-torque 1 (ot1) Over-torque 1 warning	Warning setting parameter	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	 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 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). Replace motor with a larger capacity motor.
			Reset method	When the output current < P06.07, the ot1 warning automatically clears	 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
			Reset condition	When the output current < P06.07, the ot1 warning automatically clears	 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
			Record	N/A	tracking function. Adjust the maximum current for P07.09 speed tracking.
			(conti	nued next page)	

	Warning Codes (continued)									
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res		Corrective Action					
			Action Level Action Time	P06.10 P06.11	1) Configure the settings for P06.10 and P06.11 again.					
o£2	21	Over-torque (ot2) Over-torque 2 warning	Warning setting parameter	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	 PUb. 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. 					
			Reset method	When the output current < P06.10, the ot2 warning automatically clears	 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 					
			Reset condition	When the output current < P06.10, the ot2 warning automatically clears	 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)									
Display on GS30 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 \leq 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 				
					Reset condition	When the temperature is \leq P06.30 level, the oH3 warning automatically clears.	 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 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.				
			Action Level	When the drive outputs at constant speed, and F>H or F <h exceeds="" level<="" p07.29="" td="" the=""><td></td></h>					
		Over slip warning (oSL)	Action Time	P07.30	-				
o5L 24	Over slip warning. By using the maximum slip (P10.29) as the base, when the drive	Warning setting parameter	P07.31=0 Warning 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning	 Check the motor parameter. Verify load and decrease the loading if needed. 					
υJL		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	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	1				
			(conti	nued next page)					

Display				Codes (continued)		
on GS30 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".		
		Parameter auto-tuning	Action Time Warning setting	N/A N/A	When the pute tuning is finished the	
ΕUn	25	is processing. When running auto- tuning, the keypad	parameter Reset method	When auto-tuning is finished and no error occurs, the warning automatically clears.	When the auto-tuning is finished, the warning automatically clears.	
		displays "tUn".	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	(0	28	Output phase loss (oPHL)	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	 needed. 3) Ensure a three-phase motor is being used. 4) Check if the control board cable is loose. If yes, reconnect the cable and run the drive to test. If the error still
		Output phase loss of the drive	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 mete If the current is balanced and the 	
			Reset condition	N/A	oPHL error still shows on the display contact AutomationDirect Technical	
			Record	N/A	6) Verify the drive's capacity matches c 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 between different HP/models.	
		Keypad COPY error 3: copy model error	Warning setting parameter	N/A		
		-	Reset method	Manual reset		
			Reset condition	N/A		
			Record	N/A		

			Warning	Codes (continued)	
Display on GS30 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	 Check for mechanical error and remove the causes of malfunction. Verify load and decrease the loading
₀ЕЭ	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)	

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Display			Warning	Codes (continued)	
on GS30 Keypad	ID No.	Warning Name and Description	Action and Res	et	Corrective Action
			Action Level	P14.78	 Configure the settings for P14.78 and P14.79 again. Check for mechanical error and
			Action Time	P14.79	 Check for mechanical error and remove the causes of malfunction. Verify load and decrease the loading
oE4 32	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 decreases and the motor does not stall. 9) Correct the parameter settings for speed tracking. Start the speed
			Reset condition	When the output current < P14.79, the ot4 warning automatically clears	
			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.	Verify the data number used when downloading the PLC program and use
			Action Time	Immediately act when the fault is detected	
PLod	50		Warning setting parameter	N/A	
	PLC download error warning	Reset method	Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears.	the correct data number.	
			Reset condition Record	N/A N/A	
PLSu			Action Level	The program detects incorrect written address (e.g. the address exceeds the range) during PLC operation, then the PLSv warning occurs.	
		PLC save memory error (PLSv)	Action Time	Immediately act when the fault is detected	Make cure the written address is correct
	51	Data error during PLC	Warning setting parameter	N/A Chack if the program is correct.	Make sure the written address is correct and download the program again.
		operation	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	

	1		Warning	Codes (continued)	1
Display on GS30 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
rlon	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	
		Function defect (PLFn)	Action Level	The program detects incorrect command (unsupported command) during PLC downloading, then PLFn warning occurs.	Check the drive firmware and if not the latest version, download and install the latest version from the ADC support website
			Action Time	Immediately act when the fault is detected	
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.	
			Reset condition	N/A	
			Record Action Level	N/A When PLC runs the last command and the command exceeds the maximum capacity of the reasons then PL or	
PLor		PLC buffer overflow	Action Time	of the program, then PLor warning occurs. Immediately act when the fault is detected	Follow the steps below to reset the PLC software:
	54	(PLor)	Warning setting	N/A	1) Disable PLC
		PLC register overflow	parameter Reset method	Check if the program is correct and download the program again. If the fault does not exist, the warning automatically clears.	 2) Reset the PLC program (P00.02=6) 3) Enable PLC 4) Re-download the PLC program
			Reset condition	N/A	1
			Record	N/A]
			(conti	nued next page)	

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Display				Codes (continued)	
on GS30 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	N/A	
			Action Level	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
	56	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
PL5n 56	00	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	N/A	
		No end command (PLEd) PLC end command is missing	Action Level	The "End" command is missing. Until the last command is executed, the PLEd warning occurs.	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
			Action Time	Immediately act when the fault is detected	
PLEd	57		Warning setting parameter	NA	
			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	
PLCr 58		Action Level	The MC command is detected during PLC operation, but there is no corresponding MCR command, then the PLCr warning occurs.		
		PLC MCR error (PLCr)	Action Time	Immediately act when the fault is detected	The MC command cannot be used continuously for 9 times. Check and reset the program, then re-download th program.
	58	PLC MCR command	Warning setting parameter	NA	
		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	N/A	

	Warning Codes (continued)					
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res	et	Corrective Action	
		Action Level	PLC download failure due to momentary power loss during download. After the power is again present, the PLdF warning occurs.			
		PLC download fail	Action Time	Immediately act when the fault is detected	Check for programming errors, if they	
PLdF	59	(PLdF)	Warning setting parameter	NA	exist, correct and download the program again.	
		PLC download failure	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.	agan.	
			Reset condition	N/A	-	
			Record	N/A	1	
			Action Level	When the PLC scan time exceeds the maximum allowable time (400 ms), the PLSF warning occurs.	_	
		PLC scan time fail (PLSF)	Action Time	Immediately act when the fault is detected		
PLSF	60	PLC scan time exceeds	Warning setting parameter	NA	Check for Source Code errors, if they exist, correct and download the progra	
	the maximum allowable time	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.	again.		
			Reset condition	N/A		
			Record	N/A		
		ExCOM ID fail (ECid) Duplicate MAC ID error Node address setting error	Action Level	Duplicate setting of MAC ID, Node address setting error	1) If setting address exceeds the range (0–63), check the address setting of	
			Action Time Warning setting	N/A	the communication card (P09.70).2) If the speed setting exceeds the	
EC id	70		parameter	N/A Correct the setting and cycle	range, standard: 0–2, non-standard: 0–7.	
			Reset method Reset condition	the power. N/A	3) If the address is duplicated with other nodes on the bus, reset the	
			Record	N/A	address.	
		Action Level	The 5V power that the drive provides to the communication card is too low	 Make sure the communication card well inserted and not loose. Use the same communication card 		
		ExCom power loss	Action Time	Immediately act	with another GS30 drive to check if	
		(ECLv)	Warning setting	N/A	the ECLv warning still occurs. If yes,	
ECLu	71		parameter	-	replace with a new communication	
		Low voltage of the	Reset method Reset condition	Cycle the power N/A	card; if not, replace the drive.	
	communication card	Record	N/A	 Use another communication card to test if the ECLv warning still occurs on the same drive. If not, replace the card; if yes, replace the drive. 		
			Action Level	The communication card is in the test mode		
		ExCom test mode (ECtt)	Action Time	Immediately act	4	
ЕСЕЕ	72	The communication	Warning setting parameter	N/A	Cycle the power	
		card is in the test mode		Cycle the power and enter the normal mode		
			Reset condition	N/A		
			Record	N/A		
			(conti	nued next page)		

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Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res		Corrective Action
		ExCom Bus off (ECbF)	Action Level	When the drive detects bus-off (for DeviceNet)	
		Action Time	Immediately acts	-	
		The communication card detects too many	Warning setting	N/A	 Check for poor cable connection and re-connec the cable
ЕСЬF	73	errors in the BUS,	parameter Reset method	Cycle the power	2) Cable may be bad, replace entire
		then enters the bus-	Reset condition	N/A	cable.
		off status and stops communicationg.	Record	N/A	-
			Action Level	There is no power supply on	
		ExCom no power		the DeviceNet	-
		(ECnP)	Action Time Warning setting	Immediately acts	Chack if the cable and newer is normal
EEnP	74	There is no power	parameter	N/A	Check if the cable and power is normal. yes, return device to AutomationDirect.
		supply on the	Reset method	Re-power	-
		DeviceNet	Reset condition	N/A	-
			Record Action Level	N/A Factory default setting error	
		ExCom factory defect	Action Time	Immediately act	-
		(ECFF)	Warning setting		-
EEFF	75	(2017)	parameter	N/A	Use GSoft2 to download a new
		Factory default setting	Reset method	Cycle the power	parameter set into the drive.
		error	Reset condition	N/A	
			Record	N/A	
			Action Level	Internal memory saving error	1) Verify the wiring of the control
		ExCom inner error (ECiF) Serious internal error	Action Time	Immediately act	circuit, and the wiring/grounding
EE ,F 76	76		Warning setting parameter	N/A	of the main circuit to prevent interference.
	10		Reset method	Cycle the power	2) Cycle the power.
			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	N/A	
		ExCom parameter data	Action Time	N/A	-
		error (ECPP) Profibus parameter data error	Warning setting	N/A	The CCD file is incoment, not the correst
EEPP	78		parameter	IN/A	The GSD file is incorrect - get the corre GSD file from the software.
			Reset method	Manual reset	
			Reset condition	Immediately reset	_
			Record	N/A	
		ExCom configuration	Action Level Action Time	N/A N/A	-
		data error (FCPi)	Warning setting		-
ЕСР і	79	data error (ECPi)	parameter	N/A	The GSD file is incorrect - get the correct
		Profibus configuration	Reset method	Manual reset	GSD file from the software.
		data error	Reset condition	Immediately reset	
			Record	N/A	
		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		
		Communication time	Action Level Action Time	N/A N/A	-
		Communication time- out (ECto)	Warning setting	N/A	1) Check the connection of the
<i></i>		c	parameter		communication cable and re-connec
ECto	81	Communication time-	Reset method	N/A	if needed.
		out for communication	Reset condition	CMC-EC01: auto resets when the communication with the	2) Check communication of upper unit
		card and the upper	Reset condition	upper unit is back to normal.	
	limit		N/A	4	

Display on GS30	ID No.	Warning Name and	Warning Codes (continued)		Compating Astion
on GS30 Keypad	ID NO.	Description	Action and Res	et	Corrective Action
			Action Level	Software detection	
	Checksum error (ECCS)	Action Time	N/A		
		Warning setting	N/A	Verify the wiring of the control circuit,	
EEES	82	Checksum error for the	parameter	-	and the wiring/grounding of the main
		communication card	Reset method Reset condition	Manual reset	circuit to prevent interference.
		and the drive	Record	Immediately reset	-
			Record	Communication card returns to	
			Action Level	the default setting	
		Return defect (ECrF)	Action Time	N/A	-
			Warning setting		
EErF	83	Communication card	parameter	N/A	No actions required.
		returns to the default	Reset method	Manual reset	
		setting	Reset condition	Immediately reset]
			Record	N/A	
			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.
		Modbus TCP over (ECo0) 4 Modbus TCP exceeds the maximum communication value	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. I it is, revise the program of the upper
ΕΓοΟ 84	84		Reset method	Manual reset	unit to disconnect the connection while the communication is not used 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 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	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
EE 0 1 85	EtherNet/IP over (ECo1) 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	4
			Action Time	Immediately act	
<i></i>		IP fail (ECiP)	Warning setting	N/A	1) Reset IP
EC iP	86		parameter		2) Contact MIS to check if DHCP Server
		IP setting error	Reset method	Manual reset	works normally
			Reset condition	Immediately reset	4
	1		Record	N/A	

Chapter 6: Maintenance and Troubleshooting

Disular	1		vvarning	Codes (continued)	
Display on GS30 Keypad	ID No.	Warning Name and Description	Action and Res		Corrective Action
		Mail fail (EC3F)	Action Level	Communication card establishes alarm conditions	
		Mail warning. Alarm	Action Time	Immediately acts	
ECBF	87	mail will be sent when	Warning setting	N/A	No action.
		the communication	parameter	-	
		card establishes alarm	Reset method Reset condition	Manual reset Immediately resets	-
		conditions	Record	N/A	
			Action Level	Software detection	
		ExCom busy (ECbY)	Action Time	N/A	
			Warning setting	N/A	
ЕСЬУ	88	Communication card	parameter	-	Decrease communication packets
		busy: too many packets are received	Reset method Reset condition	Manual reset	-
		are received	Record	N/A	
			Action Level	Communication card break off	
			Action Time	N/A	
		ExCom card break	Warning setting	N/A	
c c c i		(ECCb)	parameter		
ЕССЬ	89	Communication card	Reset method	Auto-resets after the communication card is re-	Re-install the communication card
		break off warning	Reset method	installed	
		break on warning	Reset condition	Immediately reset	-
			Record	N/A	
		Copy PLC: password	Action Level	PLC password is incorrect	
		error (CPLP) Copy PLC password error. When PLC copy is processing and the PLC password is incorrect, the CPLP warning occurs.	Action Time	Immediately act	
			Warning setting	N/A	
EPLP	90		parameter		Reset and enter the correct PLC
	50		Reset method	Manual reset	password
			Reset condition	Directly reset	
			Record	N/A	
			Action Level	Incorrect process when copying the PLC read mode	Cycle the power and copy the PLC read mode again
		Copy PLC: Read mode	Action Time	Immediately act	
CPLO	91	error (CPL0) Copy PLC read mode error	Warning setting	N/A	
			parameter		
			Reset method	Manual reset	
			Reset condition Record	Directly reset	-
				Incorrect process when copying	
		Comy DI Cu Muito modo	Action Level	the PLC write mode	
		Copy PLC: Write mode (CPL1)	Action Time	Immediately act	
EPL I	92		Warning setting	N/A	Cycle the power and copy the PLC writ
/		Copy PLC write mode	parameter Reset method		mode again
		error	Reset method Reset condition	Manual reset Directly reset	4
			Record	N/A	4
	Copy PLC: version error	Action Level	Software detection		
		(CPLv)	Action Time	Immediately act	
			Warning setting	N/A	Check if the copied PLC program is for
EPLu 93	93	Copy PLC version error. When a non-GS30	parameter		GS30. If not, use the correct GS30 PLC
		built-in PLC is copied	Reset method	Manual reset	program.
		to the GS30 drive, the	Reset condition	Directly reset	-
		CPLv warning occurs.	Record	N/A	
			Action Level	Software detection	
		Copy PLC: size error	Action Time	Immediately act	
c n. c		(CPLS)	Warning setting	N/A	Check if the copied PLC program is for
EPLS	94		parameter Reset method	Manual reset	GS30. Use the correct capacity for the
		Copy PLC capacity error	Reset condition	Directly reset	GS30 PLC program.
			Record	N/A	
					i

FAULT CODES

The GS30 drive has a comprehensive fault diagnostic system that include a variety of fault messages. When a fault is detected, the GS30 drive will shut down in order to protect internal components. The following faults are displayed as shown on the GS30 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 GS30 drive <u>repeatedly</u> display a reserved fault, please note the fault ID number and contact AutomationDirect technical support.

Fault Codes				
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, a	and Corrective Action
	1	Over-current during acceleration (ocA) Output current exceeds three times of the rated current during acceleration. When ocA occurs, the drive closes the gate of the output immediately, the motor runs freely, and the display shows an ocA error.	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 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. 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) 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's nameplate should ≤ the rated current on the motor's nameplate should ≤ the rated current of the drive). 7) Check the action timing of the contactor and make sure it is not turned ON/OFF when the drive outputs the voltage. 8) Adjust the V/F curve setting and frequency/voltage. When the fault occurs, and the frequency voltage is too high, reduce the voltage. 9) Adjust the torque compensation (refer to P07.26 torque compensation gain) until the output current reduces and the motor 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. 13) Check the settings for P00.11 control mode: a) For IM, P00.11=0, 1, 2, 5 b) For PM, P00.11=2 14) Increase the AC motor drive's capacity.
			(contin	15) Install AC reactor(s) on the output side (U/V/W)

		Fault C	Codes (continued)
	D No. Fault Name and Description	Action, Reset, c	and Corrective Action
محط ع de محط 2 de W W dr th th th th th	1 ocA (continued)	Corrective Actions (cont'd)	 16) 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: 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 proper value.
محط ع de محط 2 de W W dr th th th th th		Action Level	300% of the rated current
محط ع de محط 2 de W W dr th th th th th		Action Time	Immediately act
محط ع de محط 2 de W W dr th th th th th		Fault setting	N/A
محط ع de محط 2 de W W dr th th th an		parameter	
محط ع de محط 2 de W W dr th th th th th		Reset method	Manual reset
محط ع de محط 2 de W W dr th th th th an		Reset condition Record	Reset in five seconds after the fault is cleared Yes
محط ع de محط 2 de W W dr th th th th th		Record	1) Check if the deceleration time is too short. If so:
	Over-current during 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 an ocd error.	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 of AC motor drive as needed. Verify 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//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. a) Check for possible

1	I	Fault C	Codes (continued)
ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
			300% of the rated current Immediately act N/A Manual reset Reset in five seconds after the fault is cleared Yes
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 Time Fault setting	N/A N/A N/A
4	Ground fault (GFF) 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.	Reset method Reset condition Record Corrective Actions	 Manual reset Reset in five seconds after the fault is cleared Yes 1) Check for motor burnout or aging insulation. a) Check the motor insulation value with megger. b) Replace the motor if the insulation is poor. 2) Check the cable for short circuits and replace the cable if needed. 3) If the motor cable length exceeds 100 m, decrease the setting value for the carrier frequency and take remedies to reduce stray capacitance. 4) 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. 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 ocd.
	3	ID No. Description 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. Ground fault (GFF) 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 an ocn error.	ID No.Fault Name and DescriptionAction, Reset, of Action Level Action Time Fault setting parameter Reset method Reset condition Record3Over-current during steady operation (ocn)Action Time Fault setting parameter Reset condition Record3Over-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 Actions4Ground fault (GFF)Action Level Action Time Fault setting parameter Reset method Reset condition4When 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

Display n GS30 ID No. Keypad	Fault Name and		
	Description	Action, Reset, a	and Corrective Action
occ 5	IGBT short circuit between upper bridge and lower bridge (occ) Short-circuit is detected between upper bridge and lower bridge of the IGBT module	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	Hardware protection Act immediately N/A Manual reset Rest in 5 seconds after the fault is cleared Yes 1) Check the motor wiring. 2) Cycle the power. If occ still occurs, return to AutomationDirect.
oc5 6	Over-current at stop (ocS) Over-current or hardware failure in current detection at stop. Cycle the power after ocS occurs. If the hardware failure occurs, the display shows cd1, cd2 or cd3.	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	 300% of the rated current Immediately act N/A Manual reset Reset in five seconds after the fault is cleared Yes 1) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 2) Check if other error codes such as cd1–cd3 occur after cycling the power. If yes, return to the factory for repair.
oufi 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.	Action Level Action Time Fault setting parameter Reset method Reset condition Record	 230V series: 410VDC 460V series: 820VDC 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 acceleration. If too slow: 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 outo-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.

Fault Codes (continued)				
Display on GS30 Keypad	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	 230V series: 410VDC 460V series: 820VDC 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. f) Use over-voltage stall prevention (P06.01). g) Use auto-acceleration and auto-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 motor 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 interference.
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.	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	 230V series: 410VDC 230V series: 820VDC 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 motor 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 GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
			Action Level	230V series: 410VDC 460V series: 820VDC
			Action Time Fault setting	Immediately act when the DC bus voltage is higher than the level
			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
5ىم	10	Over-voltage at stop (ovS) Over-voltage at stop	Record Corrective	 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
			Actions	 cable, wiring box, or its internal terminals. 4) If using a braking resistor or braking unit, check the wiring. 5) Verify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference. 6) Check if other error codes such as cd1–cd3 occur after cycling the power. If yes, contact AutomationDirect Technical Support.
	11	Low-voltage during acceleration (LvA) DC bus voltage is lower than P06.00 setting value during acceleration	Action Level	P06.00 230V series = 180VDC 460V series = 360VDC
			Action Time	Immediately act when the DC bus voltage is lower than P06.00
			Fault setting parameter	N/A
			Reset method	Manual reset
			Reset condition Record	Reset when the DC bus voltage is higher than P06.00 + 30 V Yes
LuA			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 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. P06.00
Lud	12	Low-voltage during deceleration (Lvd) DC bus voltage is lower than P06.00 setting value during deceleration	Action Level Action Time Fault setting parameter Reset method Reset condition Record	230V series = 180VDC 460V series = 360VDC Immediately act when the DC bus voltage is lower than P06.00 N/A Manual reset Reset when the DC bus voltage is higher than P06.00 + 30 V Yes
			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).

Fault Codes (continued)				
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, a	and Corrective Action
			Action Level	P06.00 230V series = 180VDC 460V series = 360VDC Immediately act when the DC bus voltage is lower than P06.00
			Fault setting parameter	N/A
		Low-voltage at constant speed (Lvn)	Reset method	Manual reset
1 _	12		Reset condition Record	Reset when the DC bus voltage is higher than P06.00 + 30 V
Lun	13	DC bus voltage is lower than P06.00 setting value at constant speed	Corrective Actions	 Yes 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).
		Low-voltage at stop (LvS) DC bus voltage is	Action Level	P06.00 230V series = 180VDC 460V series = 360VDC
			Action Time	Immediately act when the DC bus voltage is lower than P06.00
			Fault setting parameter	N/A
_			Reset method	Manual / Auto: 230V series: Lv level + 30VDC + 500ms 460V series: Lv level + 60VDC + 500ms
LuS	14	lower than P06.00	Reset condition	500 ms
		setting value at stop or a hardware failure in voltage detection had occurred.	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.
	15		Fault setting parameter Reset method	P06.53 Manual reset
			Reset condition	Immediately reset when DC bus is higher than P07.00
or P			Record Corrective Actions	 Yes Verify 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 GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, and Corrective Action	
псурии			Action Level	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.
			Action Time Fault setting	Immediately when limit is reached. N/A
		IGBT overheating (oH1)	parameter Reset method	Manual reset
		IGBT temperature	Reset condition	Reset only when IGBT temperature is lower than oH1 error level minus (-) 10°C
	10	exceeds the protection	Record	Yes
оН I	1	level. Protection level is model default of P06.15 + 5°C	Corrective Actions	 Check the ambient temperature. Regularly inspect the ventilation hole of the control cabinet. Change the installed location if there are heating objects, such as braking resistors, in the surroundings. Install/add cooling fan or air conditioner to lower the temperature inside the cabinet. Check for and remove obstructions or replace the cooling fan. Increase ventilation space of the drive. Decrease loading. Decrease the carrier wave. Replace the drive with higher capacity model.
			Action Level	Refer to the overheat setpoint for each model.
		Over-heat key components (oH2) The drive has detected the key components are overheating	Action Time	The oH2 fault occurs when the temperature sensor of key components detects the temperature is higher than the protection level for 100ms.
			Fault setting parameter	N/A
	17		Reset method	Manual reset
			Reset condition	The drive auto-resets when the temperature sensor of key components
			Record	detects the temperature is lower than oH2 error level by 10°C Yes
oH2			Corrective Actions	 Check the ambient temperature. Regularly inspect the ventilation hole of the control cabinet. Change the installed location if there are heating objects, such as braking resistors, in the surroundings. Install/add cooling fan or air conditioner to lower the temperature inside the cabinet. Check for and remove obstructions or replace the cooling fan. Increase ventilation space of the drive. Decrease loading. Decrease the carrier wave. Replace the drive with higher capacity model. Install reactor(s). Reduce load changes.
		IGBT temperature detection failure (tH1o)	Action Level	NTC broken or wiring failure When the IGBT temperature is higher than the protection level, and
	18		Action Time Fault setting	detection time exceeds 100 ms, the tH1o protection activates.
EH lo			parameter	N/A
		IGBT hardware failure in	Reset method Reset condition	Manual reset Immediately reset
		temperature detection	Record	Yes
			Corrective Actions	Wait for 10 minutes, and then cycle the power. Check if tH1o protection
		Capacitor hardware fault (tH2o) Hardware failure in capacitor temperature detection	Action Level	still exists. If yes, contact AutomationDirect Technical Support. NTC broken or wiring failure
£H2o	19 Hardware capacitor		Action Time	When the IGBT temperature is higher than the protection level, and detection time exceeds 100 ms, the tH2o protection activates.
			Fault setting parameter	N/A
			Reset method Reset condition	Manual reset Immediately reset
			Record	Yes
			Corrective	Wait for 10 minutes, and then cycle the power. Check if tH2o protection
			Actions	still exists. If yes, contact AutomationDirect Technical Support.

Fault Codes (continued)					
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action	
		Over load (oL)	Action Level	Based on overload curve and derating curve.	
		The AC motor drive detects excessive drive output current.	Action Time	When the load is higher than the protection level and exceeds allowable time, the oL protection activates.	
			Fault setting parameter	N/A	
		Overload capacity:	Reset method	Manual reset	
		Variable Torque (VT):	Reset condition Record	Reset in five seconds after the fault is cleared Yes	
οL	21	 Sustains for one 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 (CT): Sustains for one minute when the drive outputs 150% of the drive's rated output current. Sustains for three seconds when the drive outputs 200% of the drive's rated output current. 	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 operation. b) Increase 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. 	
		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	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 condition	Reset in five seconds after the fault is cleared	
			Record	Yes	
EoL I	22		Corrective Actions	 Reduce the load. 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. If the EoL1 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 P06.13=1: Standard motor (motor with fan on the shaft). Verify motor rated frequency and reset if needed. Verify motor rated frequency and reset if needed. If using one drive to run multiple motors, set P06.13=2: Disable, and install thermal relay on each motor. Set stall prevention to the proper value. Adjust P07.26 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. 	

Fault Codes (continued)						
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, and Corrective Action			
			Action Level	Start counting when the output current > 150% of the motor 2 rated current		
			Action Time	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)		
			Fault setting parameter	N/A		
			Reset method	Manual reset		
			Reset condition	Reset in five seconds after the fault is cleared		
			Record	Yes		
EoL2		Electronic thermal relay 2 protection (EoL2) Electronic thermal relay 2 protection. The drive coasts to stop once it activates.	Corrective Actions	 Reduce the load. Increase the setting value for P01.12–P01.19 (accel./decel. time) 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. If the EoL2 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 P06.27=1: Standard motor (motor with fan on the shaft). Verify motor rated current and reset if needed. Verify motor rated frequency and reset if needed. If using one drive to run multiple motors, set P06.27=2: Disable, and install thermal relay on each motor. Set stall prevention to the proper value. Adjust P07.71 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. 		
	(continued next page)					
			(contu	nuea next page)		

Fault Codes (continued)				
Display on GS30 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
				2: Fault and coast to stop 3: No warning
				When P06.29=0, oH3 is a "Warning". The "Warning" is automatically
			Reset method	cleared.
			Reset method	When P06.29=1 or 2, oH3 is a "Fault". You must reset manually.
			Reset condition	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 Motor overheating	Corrective Actions	3) 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.
oH3	24_1	(PTC) (P03.00–P03.01=6		4) Check the cooling system and ensure it's working normally.
		PTC), when PTC		5) Verify the motor fan is working and replace the fan if needed.
		input > P06.30, the		6) 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.
				7) Verify accel/decel time and increase setting values for P01.12–P01.19
				(accel./ decel. time) if working cycle is too short.
				 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.
		,	(conti	nued next page)
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Display			Fault C	Codes (continued)
Display on GS30 Keypad	ID No.	Fault Name and Description		and Corrective Action
			Action Level Action Time	PT100 RTD input value > P06.57 setting (default = 7V) Immediately act
			Action Time	P06.29 setting is:
				0: Warn and continue operation
			Fault setting	1: Fault and ramp to stop
			parameter	2: Fault and coast to stop
				3: No warning
				When P06.29=0 and the temperature < P06.56, oH3 is automatically
			Reset method	cleared.
			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.
		Motor overheating		2) Verify load and decrease the loading or replace motor with a higher
		(oH3) PT100 RTD		capacity model if load is too high.
				3) Verify ambient temperature and change the installation location if
		Motor overheating		there are heating devices in the surroundings, or install/add cooling
oH3	24_2	(PT100) (P03.00-		fan or air conditioner to lower the ambient temperature.
00	_	P03.01=11 PT100).		 4) Check the cooling system and ensure it's working normally. E) Vorify the mater fan is working and replace the fan if needed
		When PT100 input > P06.57 (default = 7V),		5) Verify the motor fan is working and replace the fan if needed.6) Verify duration of low speed operation.
		the fault treatment acts		a) Decrease low-speed operation time.
		according to P06.29.		b) Change to dedicated motor for the drive.
			Corrective	c) Increase the motor capacity.
			Actions	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-poi
				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 of PT100 RTD.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.
			Action Level	P06.07
			Action Time	P06.08
				P06.06 setting is:
				0: No function
			Fault setting	1: Continue operation after over-torque detection during constant speed
			Fault setting parameter	operation
				operation 2: Stop after over-torque detection during constant speed operation
				operation 2: Stop after over-torque detection during constant speed operation 3: Continue operation after over-torque detection during RUN
		0.000 400 500 1 (11)		operation 2: Stop after over-torque detection during constant speed operation
		Over torque 1 (ot1)		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 cleared when the output current < (Pr.06-07 – 5%)
			parameter Reset method	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 cleared when the output current < (Pr.06-07 – 5%) When P06.06=2 or 4, ot1 is a "Fault". You must reset manually.
		When the output	parameter Reset method Reset condition	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 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
		When the output current exceeds the	parameter Reset method	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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded.
ot l	26	When the output current exceeds the over-torque detection	parameter Reset method Reset condition	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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08.
ot 1	26	When the output current exceeds the over-torque detection level (P06.07) and exceeds over-torque	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction.
ot 1	26	When the output current exceeds the over-torque detection level (P06.07) and exceeds over-torque detection time (P06.08),	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model.
ot 1	26	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	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time)
ot 1	26	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,	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) Adjust the V/F curve (Motor 1, P01.01–P01.08), especially the setting
ot 1	26	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	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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
ot 1	26	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,	parameter Reset method Reset condition	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) Adjust the V/F curve (Motor 1, P01.01–P01.08), especially the setting
ot 1	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) Adjust the V/F curve (Motor 1, P01.01–P01.08), especially the setting value for the mid-point voltage is set too low, the load capacity decreases at low speed). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time.
ot 1	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity.
ot I	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.26 torque compensation gain until the current reduces
ot I	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall.
ot I	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall. 8) Very speed tracking settings and correct the parameter settings as
ос I	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall. 8) Very speed tracking settings and correct the parameter settings as needed.
ot 1	26	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,	parameter Reset method Reset condition Record	 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 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 When P06.06=2 or 4, ot1 is a "Fault", and the fault is recorded. 1) Verify the settings for P06.07 and P06.08. 2) Check for mechanical failure and remove any causes of malfunction. 3) Reduce the load or replace the motor with a higher capacity model. 4) Increase the setting values for P01.12–P01.19 (accel./decel. time) 5) 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). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.26 torque compensation gain until the current reduces and the motor does not stall. 8) Very speed tracking settings and correct the parameter settings as

Display	1		Fault C	odes (continued)
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, a	and Corrective Action
			Action Level Action Time	P06.10 P06.11 P06.09 setting is: 0: No function 1: Continue operation after over-torque detection during constant speed
			Fault setting parameter	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) When the output	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.
		current exceeds the	Reset condition	Immediately reset
		over-torque detection	Record	When P06.09=2 or 4, ot2 is a "Fault", and the fault is recorded.
o£2	27	level (P06.10) and exceeds over-torque detection time (P06.11), and when P06.09 is set to 2 or 4, the ot2 error		 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
		displays. Under current (uC)	Corrective Actions	 low, the load capacity decreases at low speed). 6) If error occurs during low-speed operation: a) Decrease low-speed operation time. b) Increase the motor capacity. 7) Adjust P07.71 torque compensation gain until the current reduces
				 and the motor does not stall. 8) 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.
			Action Level Action Time	P06.71 P06.72
			Fault 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
UС	28		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.
			Action Level	When under the speed mode (not FOCPG), negative running limit or positive running limit is enabled.
		Limit error (LiT)	Action Time	Immediately acts.
LıE		This code occurs when	Fault setting parameter	N/A
		the motor drive is running under speed	Reset method	Move the motor away from the limit position and press the STOP/RESET button on the keypad (manual reset).
	29	mode (not IMFOCPG/ PMFOCPG) and the	Reset condition Record	Yes
		negative running limit or the positive running limit of the Dlx terminals is enabled.	Corrective Actions	 Set the limit ON/OFF switch to the correct position. Set P00.04=16 (digital input status ON/OFF) to verify if the DIx terminals work properly. Reduce deceleration time. Adjust setting value of DC brake to current level (P07.01 or the insert position on the brake unit).

Display Repard ID No. Fault Name and Description Action Level Firmware internal detection Action Time 62 Action mediately when the drive detects the fault Action Time 62 Action mediately when the drive detects the fault CF2 31 Internal EEPROM read error (cF2) Reset condition Immadiately reset Internal EEPROM cannot be read Reset condition Immadiately reset Action reset Corrective 1) Press RESET* key or reset the parameter to the default setting. Cref2 33 U-phase error (cd1) Reset condition Immediately reset Action Imme Corrective Corrective Corrective Cycle the power, if cf2 error still occurs, contact AutomationDirect technical Support. L-phase current detection error when power is ON Reset condition N/A Corrective Cycle the power, if cf1 error still occurs, contact AutomationDirect technical Support. Action Level Hardware detection Action Level Hardware detection Mass current detection error when power ON Reset condition N/A Corrective Cycle the power, if cd2 error still occurs, contact AutomationDirect technical Support.				Fault C	Codes (continued)
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Hd I 37 Actions Technical Support. Hd I Action Level Hardware detection Action Time Hd1 acts immediately when the drive detects the fault Fault setting parameter N/A Reset method Power-off Reset condition N/A Reset condition N/A Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.			error when power is ON		
Hd I 37 Action Level Hardware detection Action Time Hd1 acts immediately when the drive detects the fault Fault setting parameter N/A Reset method Power-off Reset condition N/A Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.					
Hd I 37 Action Time Hd1 acts immediately when the drive detects the fault Fault setting parameter N/A error when power is ON Reset method Power-off Reset condition N/A Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect					
Hd I 37 oc hardware error (Hd1) Fault setting parameter N/A error when power is ON Reset method Power-off Reset condition N/A Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect					Hd1 acts immediately when the drive detects the fault
Hd I 37 oc hardware protection error when power is ON Reset method Power-off Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.			oc hardware error (Hd1)	Fault setting	
error when power is ON error when power is ON Corrective Actions Reset condition N/A Record Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.	Hd 1	37			Power-off
error when power is ON Record Yes Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.					
Corrective Actions Cycle the power, if Hd1 error still occurs, contact AutomationDirect Technical Support.			error when power is ON		
				Corrective	Cycle the power, if Hd1 error still occurs, contact AutomationDirect
			1		

Fault Codes (continued)				
	Fault Name and Description	Action, Reset, a	and Corrective Action	
		Action Level Action Time Fault setting parameter	Hardware detection Immediately act N/A	
		Reset method	Manual reset Immediately reset Yes	
	Auto-tuning error (AUE) Motor auto-tuning error	Corrective Actions	 This error can occur if you press the STOP key during auto-tuning. Re-execute auto-tuning. Check motor capacity and related parameters. a) Set the correct parameters P01.01–P01.02. b) Set P01.00 larger than the motor rated frequency. Check the motor wiring. Check for motor shaft lock and remove cause of lock if needed. Check for electromagnetic contactor at output (U/V/W) and make sure the electromagnetic valve is OFF. Verify load. If too heavy: a) Reduce the load. b) Replace the motor with a larger capacity model. Check if accel/decel time is too short, then increase the setting values for P01.12–P01.19 (accel./decel. time) if needed. 	
		Action Level Action Time Fault setting parameter	When the analog input < 4 mA (only detects 4–20 mA analog input) P08.08 P08.09 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop	
	PID loss AI2 (AFE) PID feedback loss (analog feedback signal is only valid when the PID function is enabled)	Reset method Reset condition	3: Warn and operate at last frequency When P08.09=3 or 4, AFE is a "Warning". When the feedback signal is > 4 mA, the "Warning" is automatically cleared. When P08.09=1 or 2, AFE is a "Fault". You must reset manually. Immediately reset	
		Record Corrective Actions	 When P08.09=1 or 2, AFE is a "Fault", and the fault is recorded; when P08.09=3 or 4, AFE is a "Warning", and the warning is not recorded. 1) Check the PID feedback cable and tighten the terminal. Replace the 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. 	
		Action Level	Software detection	
	PG feedback error (PGF1)	Action Time Fault setting parameter	P10.09 P10.08 0: Warn and keep operation 1: Fault and ramp to stop 2: Fault and coast to stop	
rr t r	The motor runs in a	Reset method Reset condition Record Corrective Actions	Manual reset Immediately resets Yes 1) Check and reset encoder parameter (P10.02) if incorrect. 2) Check encoder wiring and rewire if necessary. 3) Check the PG card or encoder, replace if failed. 4) Verify wiring of the control circuit and wiring/grounding of the main circuit to prevent interference.	
P9F2 43 [PG feedback loss (PGF2) P10.00 and P10.02 is not set in the PG control mode. When	Action Level Action Time Fault setting parameter Reset method Reset condition	Software detection Immediately act N/A Manual reset Immediately reset	
4	press "RUN" key, PGF2	Record Corrective Actions (contin	Yes 1) Reset encoder parameters (P10.00 and P10.02) 2) Verify correct control mode is selected (P00.11=1). nued next page)	

			Fault C	Codes (continued)
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
		PG feedback stall (PGF3)	Action Level Action Time	P10.10 P10.11 P10.12 setting is:
		Under PG mode, when the motor frequency exceeds the encoder	Fault setting parameter	0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop
P9F3	44	observer stall level	Reset method	Manual reset
		(P10.10) and starts	Reset condition Record	Immediately reset
		to count, the fault time is longer than the detection time of encoder observer stall (P10.11), then PGF3 fault occurs.	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.
			Action Level	P10.13
		PG slip error (PGF4)	Action Time Fault setting parameter	P10.14 P10.15 setting is: 0: Warn and continue operation 1: Fault and ramp to stop 2: Fault and coast to stop
РЭFЧ	45	Under PG mode, when the motor frequency exceeds encoder observer slip range (P10.13) and starts to count, the fault	Reset method	 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 condition	Immediately reset
		time is longer than	Record	When P10.15=1 or 2, PGF4 is a "Fault" and the fault is recorded.
		time is longer than the detection time of encoder observer slip (P10.14), PGF4 fault occurs.	Corrective Actions	 Reset PG feedback parameters (P10.13 and P10.14) Reset ASR parameters. Verify accel/decel times and reset if needed. Reset encoder parameters (P0.01). Verify torque limit and set new values if needed (P06.12, P11.17-P11.20) Check for and resolve any causes of motor shaft lock. Check the mechanical brake has released correctly and verify the timing of the system.
			Action Level	When the analog input is < 4 mA (only detects 4–20 mA analog input)
		AI2 loss (ACE)	Action Time Fault setting parameter	Immediately act P03.19 setting is: 0: Disable 1: Continue operation at the last frequency (warning, ANL is displayed on the keypad) 2: Decelerate to stop (warning, ANL is displayed on the keypad) 3: Stop immediately and display ACE When P03.19=1 or 2, ACE is a "Warning". When analog input signal is > 4
ACE	48	Analog input loss (including all the 4–20 mA analog signal)	Reset method Reset condition	mA, the warning is automatically cleared. When P03.19=3, ACE is a "Fault". You must reset manually. Immediately reset
			Record	When P03.19=3, ACE is a "Fault", and the fault is recorded.
			Corrective Actions	 Check the Al2 feedback cable and tighten the terminal. Replace the cable with a new one if needed. Check for external device failure and replace the device with a new one. Check all the wiring. If ACE fault still exists, contact AutomationDirect Technical Support.
			(contir	nued next page)

Fault Codes (continued)				
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
EF	49	External fault (EF) External fault. When the drive decelerates based on the setting of P07.20, the EF fault displays on the keypad.	Action Level Action Time Fault setting parameter Reset method Reset condition	DIx=10: External fault (EF) and the DI terminal is ON Immediately act P07.20 setting is: 0: Coast to stop 1: Stop by the 1st deceleration time 2: Stop by the 2nd deceleration time 3: Stop by the 3rd deceleration time 4: Stop by the 4th deceleration time 5: System deceleration time 5: System deceleration (P01.46) Manual reset Manual reset only after the external fault is cleared (terminal status is recovered)
			Record Corrective Actions	Yes Press RESET key after the fault is cleared.
EF I	50	Emergency stop (EF1) When the contact of DIx=EF1 is ON, the output stops immediately and displays EF1 on the keypad. The motor is in free running.	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	DIx=28: Emergency Stop (EF1) and the DI terminal is ON Immediately act N/A Manual reset Manual reset only after the external fault is cleared (terminal status is recovered) Yes Verify if the system is back to normal condition, and then press "RESET" key to go back to the default.
ьь	51	External base block (bb) When the contact of DIx=bb is ON, the output stops immediately and displays bb on the keypad. The motor is in free running.	Action Level Action Time Fault setting parameter Reset method Reset condition Record	DIx=11: Base Block (BB) and the DI terminal is ON Immediately act N/A The display "bb" is automatically cleared after the fault is cleared. N/A No Verify if the system is back to normal condition, and then press "RESET" key to go back to the default.
Pcod	52	Password is locked (Pcod) Entering the wrong password three consecutive times through P00.07	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	Entering the wrong password three consecutive times Immediately act N/A Manual reset Power-off Yes 1) Input the correct password after rebooting the motor drive. 2) 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.) 3) The parameter settings return to the default when the "Input 9999" process is finished.
EE I	54	Illegal command (CE1) Communication command is illegal	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	 When the function code is not 03, 06, 10, or 63. Immediately act N/A Manual reset Immediately reset No 1) Check if the communication command is correct. 2) 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. 3) 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 GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
			Action Level	When the data address is correct.
			Action Time	Immediately act
			Fault setting	N/A
			parameter Reset method	Manual reset
		Illegal data address	Reset condition	Immediately reset
		(CE2)	Record	No
CE3	55			1) Check if the communication command from the upper limit is correct.
		Data address is illegal	Corrective Actions	 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.
			Action Level	 Check the cable and replace it if necessary. When the data length is too long
			Action Time	Immediately act
			Fault setting	
			parameter	N/A
			Reset method	Manual reset
		Illegal data value (CE3)	Reset condition	Immediately reset
EE3	56		Record	No
		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. Check the cable and replace it if necessary.
			Action Level	When the data is written to read-only address.
			Action Time	Immediately act
			Fault setting	N/A
			parameter	
		Data is written to read-	Reset method	Manual reset
		only address (CE4)	Reset condition Record	Immediately reset No
СЕЧ	57		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 communication time exceeds the detection time for P09.03
				communication time-out.
			Action Time	P09.03 P09.02
				0: Warn and continue operation
			Fault setting	1: Fault and ramp to stop
			parameter	2: Fault and coast to stop
		Modbus transmission		3: No warning, no fault, and continue operation
		time-out (CE10)	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.
	1	1		Check the cable and replace it if necessary.
				nued next page)

Fault Codes (continued)					
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action	
			Action Level	 ydc occurs when the confirmation signals of Y-connection and Δ-connection are conducted at the same time. If any of confirmation signals is not conducted within P05.25, ydc occurs. 	
		Y-connection /	Action Time Fault setting	P05.25	
		Δ -connection switch	parameter	N/A	
Уdс	61	error (ydc)	Reset method	Manual reset	
200		An error occurs when Y-∆ 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. 	
			Action Level	When P07.13 is not 0, and the DC bus voltage is lower than the level of dEb.	
		Deselementies	Action Time	Immediately act	
		Deceleration energy backup error (dEb)	Fault setting parameter	N/A	
dEb	62	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	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. Then dEb displays on the keypad. Over slip error (oSL) On the basis of the maximum slip limit set via P10.29, the speed deviation is abnormal.	Reset condition	Auto: The fault is automatically cleared. Manual: When the drive decelerates to 0 Hz.	
			Record	Yes	
			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. 	
			Action Level	P07.29 100% of P07.29 = the maximum limit of the slip frequency (P10.29)	
			Action Time Fault setting parameter	P07.30 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	When the motor drive outputs at constant speed, F>H or F <h exceeds the level set via P07.29, and it exceeds</h 	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	
Srl I	72	STO Loss 1 (STL1) STO1–SCM1 internal	Reset method Reset condition Record	Hardware failure, and cannot reset. Cycle the power. N/A Yes	
		loop detection error	Corrective Actions	 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. 	

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Fault Codes (continued)				
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
5ro	76	STO (STo) Safety Torque Off function active	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions Action Level	Hardware detection 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 power. 2) Verify the connections at the drive control terminals. 3) If issue still persists, contact AutomationDirect Technical Support. Hardware detection
5rL2	77	STO Loss 2 (STL2) STO2–SCM2 internal loop detection error	Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	Immediately act N/A Hardware failure, and cannot reset. Cycle the power. N/A Yes 1) Verify the 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.
5rL3	78	STO Loss 3 (STL3) STO1–SCM1 and STO2– SCM2 internal loop detection error	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	Hardware detection Immediately act N/A Hardware failure, and cannot reset. Cycle the power. N/A 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.
Яос	79	U-phase over-current before run (Aoc) U-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	 30% 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. 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.

	1		Fault C	Codes (continued)
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
boc	80	V-phase over-current before run (boc) V-phase short circuit detected when the output wiring detection is performed before the	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.
		is performed before the drive runs.		 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.
			Action Level Action Time Fault setting parameter Reset method Reset condition	300% of the rated current Immediately act N/A Manual reset Reset in five seconds after the fault clears
c o c	81	W-phase over-current before run (coc) W-phase short circuit detected when the output wiring detection is performed before the drive runs.	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 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.

		1	Fault C	Codes (continued)
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
oPL I	82	Output phase loss U phase (oPL1) U phase output phase loss	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	 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: O: 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 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 oPL1 fault still exists, contact AutomationDirect Technical Support. 6) Make sure the capacity of the drive and motor match each other.
oPL2	83	Output phase loss V phase (oPL2) V phase output phase loss	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	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 keep operation 1: Fault and ramp to stop 2: Fault and coast to stop 3: No warning Manual reset

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Display			ruutt C	Codes (continued)
on GS30 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
		Output phase loss		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
oPL3	84	W phase (oPL3) W phase output phase loss	Record Corrective Actions	 When P06.45=1 or 2, oPL3 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 oPL3 fault still exists, contact AutomationDirect Technical Support. 6) Make sure the capacity of the drive and motor match each other.
		Low frequency overload protection (oL3) Low frequency and high current protection	Action Level Action Time Fault setting parameter	Software detection Immediately act N/A
οLЭ	87		Reset condition Record Corrective Actions	 Manual reset Immediately reset Yes 1) Enhance the heat dissipation capacity for the cabinet. 2) Lower the carrier frequency (P00.17). 3) Decrease the voltage settings that correspond to frequency below 15 Hz in the V/F curve. 4) Set P00.11=0 (V/F, general control mode). 5) Replace the drive with a higher power model.
r o ^p d	89	Rotor position detection error (roPd) Rotor position detection error protection	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective	Reset the software Immediately act N/A Manual reset Immediately reset Yes 1) Check the motor cable for damage and replace if needed. 2) Check the motor coil, if damaged replace the motor. 3) IGBT may be broken. If so, contact AutomationDirect Technical
		Ethernet Card Timeout	Actions Action Level	Support. 4) Cycle the power. If roPd still occurs during operation, contact AutomationDirect Technical Support. Software detection
CJ 10	97	(CD10) Ethernet communication has not been received from the external controller (within the Ethernet Timeout window).	Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	Immediately act N/A Manual reset Immediate reset Yes 1) Initiate Ethernet communications from the master controller again. 2) Disable checking for Ethernet Timeout in P9.94.

Fault Codes (continued)					
Display on GS30 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 (ictE)	Fault setting parameter	N/A	
			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	
6000	101	error (CP20)	parameter		
CP20	121		Reset method	N/A	
		Internal communication time-out	Record	N/A Yes	
		lime-out	Corrective		
			Actions	Contact AutomationDirect Technical Support.	
			Action Level	Software detection	
			Action Time	Immediately act	
		Internal communication	Fault setting	N/A	
		error (CP22)	parameter		
CP22	123	Abnormal internal	Reset method	N/A	
			Reset condition Record	N/A Yes	
		communication	Corrective		
			Actions	Contact AutomationDirect Technical Support.	
			Action Level	Software detection	
			Action Time	Immediately act	
		Internal communication		N/A	
6000	10.	error (CP30)	parameter		
CP30	124	Abnormal internal communication	Reset method	N/A	
			Reset condition Record	N/A Yes	
			Corrective		
			Actions	Contact AutomationDirect Technical Support.	
			Action Level	Software detection	
	120	Internal communication error (CP32)	Action Time	Immediately act	
			5	N/A	
			parameter		
CP32	126	Abnormalinternal	Reset method Reset condition	N/A N/A	
		Abnormal internal communication	Reset condition	N/A Yes	
			Corrective		
			Actions	Contact AutomationDirect Technical Support.	
	127		Action Level	Software detection	
		Internal communication error (CP33)	Action Time	Immediately act	
			Fault setting	N/A	
			parameter		
[P33			Reset method		
			Reset condition Record	N/A Yes	
			Corrective		
			Actions	Contact AutomationDirect Technical Support.	
(continued next page)					

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Fault Codes (continued)				
Display on GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
			Action Level	P14.75
		Over-torque 3 (ot3)	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
			Reset method	4: Stop after over-torque detection during RUN 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
oŁЭ	128	current exceeds the over-torque detection level (P14.75) and exceeds over-torque detection time (P14.76), and when P14.74 is set to 2 or 4, the ot3 error displays.	Record Corrective Actions	 P14.74=2 or 4, ot3 is a "Fault", and the fault is recorded. 1) Configure the settings for P14.75 and P14.76 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, P01.54–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. 8) Verify torque compensation and adjust P07.73 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
			Action Level Action Time	tracking function. Adjust the maximum current for P07.09 speed tracking. P14.78 P14.79
	129	Over-torque 4 (ot4) When the output 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.	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
			Reset method Reset condition	When P14.77=1 or 3, ot3 is a "Warning". The warning is automatically cleared when the output current < P14.75. When P14.77=2 or 4, ot3 is a "Fault". You must reset manually. Immediately reset
o£4			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 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 GS30 Keypad	ID No.	Fault Name and Description	Action, Reset, o	and Corrective Action
			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
EoL3	134	Internal communication error (EoL3) Electronic thermal relay 3 protection. The drive coasts to stop once it activates.	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. Verify motor rated frequency 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.
EoL4	135	Internal communication error (EoL4) Electronic thermal relay 4 protection. The drive coasts to stop once it activates.	Action Level Action Time Fault setting parameter Reset method Reset condition Record Corrective Actions	 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) 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 P01.62–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.

arc Sign D No. Durk Hame and Description Action, Reset, and Corrective Action Hd5 140 ochardware error (Hd5) Hardware detection Action Level Hardware detection Hd5 140 GFF hardware protection error when power is ON. Reset method Power-off NA Full GFF course before run power is ON. Reset method Power-off NA GFF course before run (bdGFF) Corrective Council to Time Immediately act twomentionDirect Technical Support. Action Level 250% of the rated current Action Level The ground short circuit detected when the output setting MA Reset method Manual reset Reset method Manual reset BUEE1 141 The ground short circuit detected when the output setting MA NA Reset method Manual reset BUEE1 142 Na foreback current excernation Reset in five accors internal wring and the UWW wring of the drive transmarker accornect. 1 Corrective Action Reset in five accors internal wring and the UWW wring of the drive insulation value with megger. Replace the motor insulation value with megger. Replace the motor insulation value with megger. Replace the motor insulation value with megger. Replace the drive insulation insulation value with megger. Replace the drive (U/V/W), versit setting NA RUEE2 143 Autor-ture eroror 3 <td< th=""><th colspan="5">Fault Codes (continued)</th></td<>	Fault Codes (continued)				
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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 GS30 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 GS30 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 GS30 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 GS30 drive failure or damage as a result of wet fiber dust adhering to components within the drive.

Solution:

Install the GS30 drive in a suitable enclosure to protect it from fiber dust. Clean and remove fiber dust regularly to prevent damage to the drive.







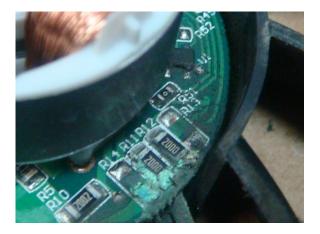
CORROSION PROBLEM

Corrosion problems may occur if any fluids or liquid in vapor form flows into the GS30 drive. Please be aware of the damage that corrosion may cause to your drive.

• Corrosion of internal components may cause the GS30 drive to malfunction and possibly explode.

Solution:

Install the GS30 drive in a suitable enclosure to protect it from fluids. Clean the drive regularly to prevent corrosion.







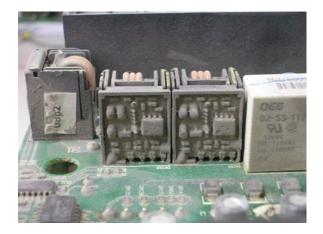
INDUSTRIAL DUST PROBLEM

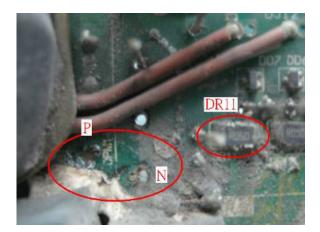
Serious industrial dust pollution frequently occurs in stone processing plants, flour mills, cement plants, and so on. Please be particularly aware of any metal dust, filings or if metalized vapor is present as these may cause damage to your drives:

- 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 GS30 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 GS30 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 GS30 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 GS30 drive have been modified, components on the affected boards may have been damaged.

Solution:

Inspect all power and control terminal connections in the GS30 drive to ensure adequate wire insertion. Do not attempt to disassemble or repair control boards in the GS30 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.

