

## 6.3 Drive Alarms, Faults, and Errors

### ◆ Types of Alarms, Faults, and Errors

Check the LED operator for information about possible faults if the drive or motor fails to operate. *Refer to Using the Digital LED Operator on page 56.*

If problems occur that are not covered in this manual, contact the nearest Yaskawa representative with the following information:

- Drive model
- Software version
- Date of purchase
- Description of the problem

**Table 6.3** contains descriptions of the various types of alarms, faults, and errors that may occur while operating the drive. Contact Yaskawa in the event of drive failure.

**Table 6.3 Types of Alarms, Faults, and Errors**

Type	Drive Responses to Alarms, Faults, and Errors
<b>Faults</b>	When the drive detects a fault: <ul style="list-style-type: none"> <li>• The digital operator displays text that indicates the specific fault and the ALM indicator LED remains lit until the fault is reset.</li> <li>• The fault interrupts drive output and the motor coasts to a stop.</li> <li>• Depending on the setting, the drive and motor may stop via different methods than listed.</li> <li>• If a digital output is programmed for fault output (H2-01 = E), it will close if a fault occurs.</li> </ul> When the drive detects a fault, it will remain inoperable until that fault has been reset. <i>Refer to Fault Reset Methods on page 139.</i>
<b>Minor Faults and Alarms</b>	When the drive detects an alarm or a minor fault: <ul style="list-style-type: none"> <li>• The digital operator displays text that indicates the specific alarm or minor fault and the ALM indicator LED flashes.</li> <li>• The motor does not stop.</li> <li>• The multi-function contact output closes if set to be tripped by a minor fault (H2-01 = 10), but not by an alarm.</li> <li>• The digital operator displays text indicating a specific alarm and ALM indicator LED flashes.</li> </ul> Remove the cause of an alarm or minor fault to automatically reset.
<b>Operation Errors</b>	When parameter settings conflict with one another or do not match hardware settings (such as with an option unit), it results in an operation error. When the drive detects an operation error: <ul style="list-style-type: none"> <li>• The digital operator displays text that indicates the specific error.</li> <li>• The multi-function contact output does not operate.</li> </ul> When the drive detects an operation error, it will not operate the motor until the error has been reset. Correct the settings that caused the operation error to reset.

### ◆ Alarm and Error Displays

#### ■ Faults

When the drive detects a fault, the ALM indicator LEDs remain lit without flashing. If the LEDs flash, the drive has detected a minor fault or alarm. *Refer to Minor Faults and Alarms on page 128* for more information. Conditions such as overvoltage or external faults can trip both faults and minor faults, therefore it is important to note whether the LEDs remain lit or if the LEDs flash.

**Table 6.4 Fault Displays**

LED Operator Display	Name	Page	LED Operator Display	Name	Page
CE	MEMOBUS/Modbus Communication Error	129	CPF20 or CPF21	RAM Fault	129
CoF	Current Offset Fault	129	CPF20 or CPF21 <->	FLASH Memory Fault	129
CPF00 or CPF01	CPF11 – RAM Fault	129	CPF22	Watchdog Circuit Exception	129
	CPF12 – FLASH Memory Fault	129	CPF23	Clock Fault	129
	CPF14 – Control Circuit Fault	129	CPF24	A/D Conversion Error	130
	CPF17 – Timing Fault	129	EF0	PWM Feedback Data Fault	130
CPF02	CPF18 – Control Circuit Fault	129	EF1 to EF5	Drive Capacity Signal Fault	130
	CPF02 A/D Conversion Error	129	Err	Option Unit External Fault	130
CPF06	Drive specification mismatch during Terminal Board or Control Board replacement	129	EF1 to EF5	External Fault (input terminal S1 to S5)	130
CPF08	EEPROM Serial Communications Fault	129	oC	EEPROM Write Error	130
			oFA01	Overcurrent	130
			oH1	Option Disconnected	131
				Heatsink Overheat	131

### 6.3 Drive Alarms, Faults, and Errors

LED Operator Display			LED Operator Display		
LED Operator Display	Name	Page	LED Operator Display	Name	Page
oL1	oL1 Motor Overload	131	PF	PF Input Phase Loss	133
oL2	oL2 Drive Overload	132	rH	rH Dynamic Braking Resistor	133
oL3	oL3 Overtorque Detection I	132	Uv1	Uv1 Undervoltage	133
oPr	oPr Operator Connection Fault	132	Uv3	Uv3 Soft Charge Circuit Fault	134
ov	ov Overvoltage	136			

- <1> Displayed as **CPF00** when occurring at drive power up. When one of the faults occurs after successfully starting the drive, the display will show **CPF01**.
- <2> Displayed as **CPF20** when occurring at drive power up. When one of the faults occurs after successfully starting the drive, the display will show **CPF21**.

#### Minor Faults and Alarms

When a minor fault or alarm occurs, the ALM LED flashes and the text display shows an alarm code. A fault has occurred if the text remains lit and does not flash. *Refer to Alarm Detection on page 135.* An overvoltage situation, for example, can trigger both faults and minor faults. It is therefore important to note whether the LEDs remain lit or if the LEDs flash.

Table 6.5 Minor Fault and Alarm Displays

LED Operator Display	Name	Minor Fault Output (H2-01 = 10)	Page
bb	bb Drive Baseblock	No output	135
CALL	CALL Serial Communication Transmission Error	YES	135
CE	CE MEMOBUS/Modbus Communication Error	YES	135
CrST	CrST Can Not Reset	YES	135
EF	EF Run Command Input Error	YES	135
EF1 to EF5	EF1 to EF5 External Fault (input terminal S1 to S5)	YES	136
oH	oH Heatsink Overheat	YES	136
oL3	oL3 Overtorque I	YES	136
ov	ov Overvoltage	YES	136
PASS	PASS MEMOBUS/Modbus Test Mode Complete	No output	137
SE	SE MEMOBUS/Modbus Test Mode Fault	YES	137
Uv	Uv Undervoltage	YES	137

#### Operation Errors

Table 6.6 Operation Error Displays

LED Operator Display	Name	Page	LED Operator Display	Name	Page
oPE01	oPE01 Drive Unit Setting Error	138	oPE05	oPE05 Run Command Selection Error	138
oPE02	oPE02 Parameter Setting Range Error	138	oPE10	oPE10 V/f Data Setting Error	138
oPE03	oPE03 Multi-Function Input Setting Error	138	oPE11	oPE11 Carrier Frequency Setting Error	138

## 6.4 Fault Detection

### ◆ Fault Displays, Causes and Possible Solutions

Table 6.7 Detailed Fault Displays, Causes and Possible Solutions

LED Operator Display		Fault Name
CE	CE	MEMOBUS/Modbus Communication Error No data was received for longer than 2 seconds.
<b>Cause</b>		<b>Possible Solution</b>
Faulty communications wiring, or a short circuit exists.		<ul style="list-style-type: none"> <li>• Check for faulty wiring.</li> <li>• Correct the wiring.</li> <li>• Check for loose wiring and short circuits. Repair as needed.</li> </ul>
A communications data error occurred due to noise.		<ul style="list-style-type: none"> <li>• Check the various options available to minimize the effects of noise.</li> <li>• Counteract noise in control circuit, main circuit, and ground wiring.</li> <li>• Use Yaskawa-recommended cables, or another type of shielded line. Ground the shield on the controller side or on the drive input power side.</li> <li>• Ensure that other equipment such as switches or relays do not cause noise and use surge suppressors if required.</li> <li>• Separate all wiring for communications devices from drive input power lines. Install a noise filter to the input side of the drive input power.</li> </ul>
LED Operator Display		Fault Name
CoF	CoF	Current Offset Fault There is a problem with the current detection circuit.
<b>Cause</b>		<b>Possible Solution</b>
While the drive automatically adjusted the current offset, the calculated value exceeded the allowable setting range.		Replace the drive.
LED Operator Display		Fault Name
CPF00 or CPF01	CPF00 or CPF01	CPF11 – RAM Fault CPF12 – Problem with the ROM (FLASH memory) CPF14 – CPU error (CPU operates incorrectly due to noise, etc.) CPF17 – A timing error occurred during an internal process CPF18 – CPU error (CPU operates incorrectly due to noise, etc.)
<b>Cause</b>		<b>Possible Solution</b>
Hardware is damaged.		Replace the drive.
LED Operator Display		Fault Name
CPF02	CPF02	A/D Conversion Error An A/D conversion error occurred.
<b>Cause</b>		<b>Possible Solution</b>
Control circuit is damaged.		Cycle power to the drive. If the problem continues, replace the drive.
Control circuit terminals have shorted out (+V, AC).		<ul style="list-style-type: none"> <li>• Check for wiring errors along the control circuit terminals.</li> <li>• Correct the wiring.</li> </ul>
Control terminal input current has exceeded allowable levels.		<ul style="list-style-type: none"> <li>• Check the input current.</li> <li>• Reduce the current input to control circuit terminal (+V) to 20 mA.</li> </ul>
LED Operator Display		Fault Name
CPF06	CPF06	EEPROM Data Error There is an error in the data saved to EEPROM.
<b>Cause</b>		<b>Possible Solution</b>
Control circuit is damaged.		Cycle power to the drive. If the problem continues, replace the drive.
The power supply was switched off when parameters were written (e.g., using an option unit).		Reinitialize the drive (A1-03).
LED Operator Display		Fault Name
CPF08	CPF08	EEPROM Communication Fault EEPROM communications are not functioning properly.
<b>Cause</b>		<b>Possible Solution</b>
Control circuit is damaged.		Cycle power to the drive. If the problem persists, replace the drive.
LED Operator Display		Fault Name
CPF20 or CPF21	CPF20 or CPF21	One of the following faults occurred: RAM fault, FLASH memory error, watchdog circuit exception, clock error <ul style="list-style-type: none"> <li>• RAM fault.</li> <li>• FLASH memory error (ROM error).</li> <li>• Watchdog circuit exception (self-diagnostic error).</li> <li>• Clock error.</li> </ul>

## 6.4 Fault Detection

Cause		Possible Solution
Hardware is damaged.		Replace the drive.
LED Operator Display		Fault Name
PF22	CPF22	A/D Conversion Fault A/D conversion error.
Cause		Possible Solution
Control circuit is damaged.		<ul style="list-style-type: none"> <li>• Cycle power to the drive. <i>Refer to Diagnosing and Resetting Faults on page 139.</i></li> <li>• If the problem continues, replace the drive.</li> </ul>
LED Operator Display		Fault Name
PF23	CPF23	PWM Feedback Fault PWM feedback error.
Cause		Possible Solution
Hardware is damaged.		Replace the drive.
LED Operator Display		Fault Name
PF24	CPF24	Drive Capacity Signal Fault Entered a capacity that does not exist. (Checked when the drive is powered up.)
Cause		Possible Solution
Hardware is damaged.		Replace the drive.
LED Operator Display		Fault Name
EF0	EF0	MEMOBUS/Modbus Communication External Fault An external fault condition is present.
Cause		Possible Solution
An external fault was received from the PLC with other than H5-04 = 3 "alarm only" (the drive continued to run after external fault).		<ul style="list-style-type: none"> <li>• Remove the cause of the external fault.</li> <li>• Remove the external fault input from the PLC.</li> </ul>
Problem with the PLC program.		Check the PLC program and correct problems.
LED Operator Display		Fault Name
EF1	EF1	External Fault (input terminal S1) External fault at multi-function input terminal S1.
EF2	EF2	External Fault (input terminal S2) External fault at multi-function input terminal S2.
EF3	EF3	External Fault (input terminal S3) External fault at multi-function input terminal S3.
EF4	EF4	External Fault (input terminal S4) External fault at multi-function input terminal S4.
EF5	EF5	External Fault (input terminal S5) External fault at multi-function input terminal S5.
Cause		Possible Solution
An external device has tripped an alarm function.		Remove the cause of the external fault and reset the fault.
Wiring is incorrect.		<ul style="list-style-type: none"> <li>• Ensure the signal lines have been connected properly to the terminals assigned for external fault detection (H1-□□ = 20 to 2F).</li> <li>• Reconnect the signal line.</li> </ul>
Incorrect setting of multi-function contact inputs.		<ul style="list-style-type: none"> <li>• Check if the unused terminals set for H1-□□ = 20 to 2F (External Fault).</li> <li>• Change the terminal settings.</li> </ul>
LED Operator Display		Fault Name
Err	Err	EEPROM Write Error Data does not match the EEPROM being written to.
Cause		Possible Solution
-		<ul style="list-style-type: none"> <li>• Press the  button.</li> <li>• Correct the parameter settings.</li> <li>• Cycle power to the drive. <i>Refer to Diagnosing and Resetting Faults on page 139.</i></li> </ul>
LED Operator Display		Fault Name
oC	oC	Overcurrent Drive sensors have detected an output current greater than the specified overcurrent level.
Cause		Possible Solution
The motor has been damaged due to overheating or the motor insulation is damaged.		<ul style="list-style-type: none"> <li>• Check the insulation resistance.</li> <li>• Replace the motor.</li> </ul>
One of the motor cables has shorted out or there is a grounding problem.		<ul style="list-style-type: none"> <li>• Check the motor cables.</li> <li>• Remove the short circuit and power the drive back up.</li> <li>• Check the resistance between the motor cables and the ground terminalⓈ.</li> <li>• Replace damaged cables.</li> </ul>

The load is too heavy.	<ul style="list-style-type: none"> <li>• Measure the current flowing into the motor.</li> <li>• Replace the drive with a larger capacity unit if the current value exceeds the rated current of the drive.</li> <li>• Determine if there is sudden fluctuation in the current level.</li> <li>• Reduce the load to avoid sudden changes in the current level or switch to a larger drive.</li> </ul>
The acceleration or deceleration times are too short.	<p>Calculate the torque needed during acceleration relative to the load inertia and the specified acceleration time.</p> <p>If the right amount of torque cannot be set, make the following changes:</p> <ul style="list-style-type: none"> <li>• Increase the acceleration time (C1-01, -03)</li> <li>• Increase the S-curve characteristics (C2-01 through C2-04)</li> <li>• Increase the capacity of the drive.</li> </ul>
The drive is attempting to operate a specialized motor or a motor larger than the maximum size allowed.	<ul style="list-style-type: none"> <li>• Check the motor capacity.</li> <li>• Ensure that the rated capacity of the drive is greater than or equal to the capacity rating found on the motor nameplate.</li> </ul>
Magnetic contactor (MC) on the output side of the drive has turned on or off.	Set up the operation sequence so that the MC is not tripped while the drive is outputting current.
V/f setting is not operating as expected.	<ul style="list-style-type: none"> <li>• Check the ratios between the voltage and frequency.</li> <li>• Set parameter E1-04 through E1-10 appropriately.</li> <li>• Lower the voltage if it is too high relative to the frequency.</li> </ul>
Excessive torque compensation.	<ul style="list-style-type: none"> <li>• Check the amount of torque compensation.</li> <li>• Reduce the torque compensation gain (C4-01) until there is no speed loss and less current.</li> </ul>
Drive fails to operate properly due to noise interference.	<ul style="list-style-type: none"> <li>• Review the possible solutions provided for handling noise interference.</li> <li>• Review the section on handling noise interference and check the control circuit lines, main circuit lines and ground wiring.</li> </ul>
Overexcitation gain is set too high.	<ul style="list-style-type: none"> <li>• Check if fault occurs simultaneously to overexcitation function operation.</li> <li>• Consider motor flux saturation and reduce the value of n3-13 (Overexcitation Deceleration Gain).</li> </ul>
Run command applied while motor was coasting.	<ul style="list-style-type: none"> <li>• Program the Speed Search command input through one of the multi-function contact input terminals (H1-□□ = "61" or "62").</li> </ul>
The motor cable is too long	Use a larger drive.
<b>LED Operator Display</b> <span style="float: right;"><b>Fault Name</b></span>	
oFA01	oFA01
Option Unit Fault	
Replace the option unit.	
<b>Cause</b> <span style="float: right;"><b>Possible Solution</b></span>	
The option unit is not properly connected to the drive.	Turn the power off and reconnect the option unit.
<b>LED Operator Display</b> <span style="float: right;"><b>Fault Name</b></span>	
oH1	oH1
Overheat I (Heatsink Overheat)	
The temperature of the heatsink has exceeded the overheat detection level.	
<b>Cause</b> <span style="float: right;"><b>Possible Solution</b></span>	
Surrounding temperature is too high.	<ul style="list-style-type: none"> <li>• Check the temperature surrounding the drive.</li> <li>• Improve the air circulation within the enclosure panel.</li> <li>• Install a fan or air conditioner to cool the surrounding area.</li> <li>• Remove anything near the drive that might be producing excessive heat.</li> </ul>
Load is too heavy.	<ul style="list-style-type: none"> <li>• Measure the output current.</li> <li>• Lower the carrier frequency (C6-02).</li> <li>• Reduce the load.</li> </ul>
Current flowing to control circuit terminal +V exceeded the tolerance level.	<ul style="list-style-type: none"> <li>• Check the current level of the terminal.</li> <li>• Set the current to the control circuit terminal to be 20 mA or less.</li> </ul>
<b>LED Operator Display</b> <span style="float: right;"><b>Fault Name</b></span>	
oL1	oL1
Motor Overload	
The electrothermal sensor tripped overload protection.	
<b>Cause</b> <span style="float: right;"><b>Possible Solution</b></span>	
Load is too heavy.	Reduce the load.
Cycle times are too short during acceleration and deceleration.	Increase the acceleration and deceleration times (C1-01 through C1-04).
<ul style="list-style-type: none"> <li>• Drive overloaded at low speeds.</li> <li>• Overload may occur at low speeds when using a general-purpose motor, even if operating within the rated current limitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the load.</li> <li>• Increase the speed.</li> <li>• If the drive is supposed to operate at low speeds, either increase the motor capacity or use a motor specifically designed to operate with the drive.</li> </ul>
Although a special type of motor is being used, the motor protection selection is set for a general-purpose motor (L1-01 = 1).	Set L1-01 = "2".
Voltage is too high for the V/f characteristics.	<ul style="list-style-type: none"> <li>• Adjust the user set V/f patterns (E1-04 through E1-10). Parameters E1-08 and E1-10 may need to be reduced.</li> <li>• If E1-08 and E1-10 are set too high, there may be very little load tolerance at low speed.</li> </ul>
The wrong motor-rated current is set to E2-01.	<ul style="list-style-type: none"> <li>• Check the motor-rated current.</li> <li>• Enter the value written on the motor nameplate to parameter E2-01.</li> </ul>
The maximum frequency for the drive input power is set too low.	<ul style="list-style-type: none"> <li>• Check the rated frequency indicated on the motor nameplate.</li> <li>• Enter the rated frequency to E1-06 (Base Frequency).</li> </ul>

## 6.4 Fault Detection

Multiple motors are running off the same drive.	Disable the Motor Protection function (L1-01 = "0") and install a thermal relay to each motor.	
The electrical thermal protection characteristics and motor overload characteristics do not match.	<ul style="list-style-type: none"> <li>Check the motor characteristics.</li> <li>Correct the value set to L1-01 (Motor Protection Function).</li> <li>Install an external thermal relay.</li> </ul>	
The electrical thermal relay is operating at the wrong level.	<ul style="list-style-type: none"> <li>Check the current rating listed on the motor nameplate.</li> <li>Check the value set for the motor-rated current (E2-01).</li> </ul>	
Motor overheated by overexcitation operation.	<ul style="list-style-type: none"> <li>Overexcitation increases the motor losses and thereby the motor temperature. If applied too long, motor damage can occur. Prevent excessive overexcitation operation or apply proper cooling to the motor.</li> <li>Reduce the excitation deceleration gain (n3-13).</li> <li>Set L3-04 (Stall Prevention during Deceleration) to a value other than 4.</li> </ul>	
Output current fluctuation due to input phase loss	Check the power supply for phase loss.	
<b>LED Operator Display</b>		<b>Fault Name</b>
$\text{oL}^2$	$\text{oL}2$	Drive Overload
The thermal sensor of the drive triggered overload protection.		<b>Possible Solution</b>
<b>Cause</b>		
Load is too heavy.		Reduce the load.
Cycle times are too short during acceleration and deceleration.		Increase the settings for the acceleration and deceleration times (C1-01 through C1-04).
Voltage is too high for the V/f characteristics.		<ul style="list-style-type: none"> <li>Adjust the preset V/f pattern (E1-04 through E1-10). This will mainly involve reducing E1-08 and E1-10.</li> <li>Be careful not to lower E1-08 and E1-10 excessively because this reduces load tolerance at low speeds.</li> </ul>
Drive capacity is too small.		Replace the drive with a larger model.
Overload occurred when operating at low speeds.		<ul style="list-style-type: none"> <li>Reduce the load when operating at low speeds.</li> <li>Replace the drive with a model that is one frame size larger.</li> <li>Lower the carrier frequency (C6-02).</li> </ul>
Excessive torque compensation.		Reduce the torque compensation gain (C4-01) until there is no speed loss but less current.
Output current fluctuation due to input phase loss		Check the power supply for phase loss.
<b>LED Operator Display</b>		<b>Fault Name</b>
$\text{oL}^3$	$\text{oL}3$	Overtorque Detection 1
The current has exceeded the value set for torque detection (L6-02) for longer than the allowable time (L6-03).		<b>Possible Solution</b>
<b>Cause</b>		
Parameter settings are not appropriate for the type of load.		Check the settings of parameters L6-02 and L6-03.
There is a fault on the machine side (e.g., the machine is locked up).		Check the status of the load. Remove the cause of the fault.
<b>LED Operator Display</b>		<b>Fault Name</b>
$\text{oPr}$	$\text{oPr}$	External Digital Operator Connection Fault
The external operator has been disconnected from the drive. <b>Note:</b> An oPr fault will occur when both of the following conditions are true: <ul style="list-style-type: none"> <li>Output is interrupted when the operator is disconnected (o2-06 = 1)</li> <li>The run command is assigned to the operator (b1-02 = 0 and LOCAL has been selected)</li> </ul>		<b>Possible Solution</b>
<b>Cause</b>		
External operator is not properly connected to the drive.		<ul style="list-style-type: none"> <li>Check the connection between the operator and the drive</li> <li>Replace the cable if damaged</li> <li>Turn off the drive input power and disconnect the operator. Next reconnect the operator and turn the drive input power back on.</li> </ul>
<b>LED Operator Display</b>		<b>Fault Name</b>
$\text{oV}$	$\text{oV}$	Overvoltage
Voltage in the DC bus has exceeded the overvoltage detection level. <ul style="list-style-type: none"> <li>For 200 V class: approximately 410 V</li> <li>For 400 V class: approximately 820 V (740 V when E1-01 is less than 400)</li> </ul>		<b>Possible Solution</b>
<b>Cause</b>		
Deceleration time is too short and regenerative energy flows from the motor into the drive.		<ul style="list-style-type: none"> <li>Increase the deceleration time (C1-02, -04).</li> <li>Install a braking resistor or a dynamic braking resistor unit.</li> <li>Enable stall prevention during deceleration (L3-04 = "1"). Stall prevention is enabled as the default setting.</li> </ul>
Excessive braking load.		The braking torque was too high, causing regenerative energy to charge the DC bus. Reduce the braking torque, use a braking option, or lengthen decel time.
Surge voltage entering from the drive input power.		Install a DC reactor. <b>Note:</b> Voltage surge can result from thyristor convertor and phase advancing capacitor using same drive main input power supply.
Ground fault in the output circuit causing the DC bus capacitor to overcharge.		<ul style="list-style-type: none"> <li>Check the motor wiring for ground faults.</li> <li>Correct grounding shorts and turn the power back on.</li> </ul>
Excessive regeneration when overshoot occurs after acceleration.		<ul style="list-style-type: none"> <li>Lengthen the S-curve at acceleration end.</li> </ul>

Drive input power voltage is too high.	<ul style="list-style-type: none"> <li>• Check the voltage.</li> <li>• Lower drive input power voltage within the limits listed in the specifications.</li> </ul>
The dynamic braking transistor is damaged.	Replace the drive.
The braking transistor is wired incorrectly.	<ul style="list-style-type: none"> <li>• Check braking transistor wiring for errors.</li> <li>• Properly rewire the braking resistor device.</li> </ul>
Drive fails to operate properly due to noise interference.	<ul style="list-style-type: none"> <li>• Review the list of possible solutions provided for controlling noise.</li> <li>• Review the section on handling noise interference and check the control circuit lines, main circuit lines and ground wiring.</li> </ul>
Motor hunting occurs.	<ul style="list-style-type: none"> <li>• Adjust the parameters that control hunting.</li> <li>• Set the hunting prevention gain (n1-02).</li> </ul>
<b>LED Operator Display</b>	
PF	PF
<b>Input Phase Loss</b>	
Drive input power has an open phase or has a large imbalance of voltage between phases. Detected when L8-05 = 1 (enabled).	
<b>Cause</b>	
<b>Possible Solution</b>	
There is phase loss in the drive input power.	<ul style="list-style-type: none"> <li>• Check for wiring errors in the main circuit drive input power.</li> <li>• Correct the wiring.</li> </ul>
There is loose wiring in the drive input power terminals.	<ul style="list-style-type: none"> <li>• Ensure the terminals are tightened properly.</li> <li>• Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Gauges and Tightening Torque on page 39</i></li> </ul>
There is excessive fluctuation in the drive input power voltage.	<ul style="list-style-type: none"> <li>• Check the voltage from the drive input power.</li> <li>• Review the possible solutions for stabilizing the drive input power.</li> <li>• Disable Input Phase Loss Detection (L8-05 = "0"). PF is detected if DC bus ripple is too high. If it is disabled, there is no fault but the ripple is still too high, thereby the capacitors are stressed more and lose lifetime.</li> </ul>
There is poor balance between voltage phases.	<ul style="list-style-type: none"> <li>• Stabilize drive input power or disable phase loss detection.</li> </ul>
The main circuit capacitors are worn.	<ul style="list-style-type: none"> <li>• Check the maintenance time for the capacitors (U4-05).</li> <li>• Replace the drive if U4-05 is greater than 90%.</li> </ul>
	<ul style="list-style-type: none"> <li>• Check for anything wrong with the drive input power.</li> <li>• If nothing is wrong with the drive input power, try the following solutions if the alarm continues:</li> <li>• Disable Input Phase Loss Protection selection (L8-05 = "0"). PF is detected if DC bus ripple is too high. If it is disabled, there is no fault but the ripple is still too high, thereby the capacitors are stressed more and lose lifetime.</li> <li>• Replace the drive.</li> </ul>
<b>LED Operator Display</b>	
rH	rH
<b>Braking Resistor Overheat</b>	
Braking resistor protection was triggered. Fault detection is enabled when L8-01 = 1 (disabled as a default). <b>Note:</b> The magnitude of the braking load trips the braking resistor overheat alarm, NOT the surface temperature. Using the braking resistor more frequently than its rating trips the alarm even when the braking resistor surface is not very hot.	
<b>Cause</b>	
<b>Possible Solution</b>	
Deceleration time is too short and excessive regenerative energy is flowing back into the drive.	<ul style="list-style-type: none"> <li>• Check the load, deceleration time and speed.</li> <li>• Reduce the load.</li> <li>• Increase the acceleration and deceleration times (C1-01 through C1-04).</li> <li>• Replace the braking option with a larger device that can handle the power that is discharged.</li> </ul>
Excessive braking inertia.	Recalculate braking load and braking power. Then try reducing the braking load and checking the braking resistor settings and improve braking capacity.
The proper braking resistor has not been installed.	<ul style="list-style-type: none"> <li>• Check the specifications and conditions for the braking resistor device.</li> <li>• Select the optimal braking resistor.</li> </ul>
<b>LED Operator Display</b>	
Uv1	Uv1
<b>DC Bus Undervoltage</b>	
One of the following conditions occurred while the drive was stopped: <ul style="list-style-type: none"> <li>• Voltage in the DC bus fell below the undervoltage detection level.</li> <li>• For 200 V class: approximately 190 V (160 V for single phase drives)</li> <li>• For 400 V class: approximately 380 V (350 V when E1-01 is less than 400) The fault is output only if L2-01 = 0 or the DC bus voltage is below the Uv detection level for a certain time while L2-01 = 1.</li> </ul>	
<b>Cause</b>	
<b>Possible Solution</b>	
Input power phase loss.	<ul style="list-style-type: none"> <li>• The main circuit drive input power is wired incorrectly.</li> <li>• Correct the wiring.</li> </ul>
One of the drive input power wiring terminals is loose.	<ul style="list-style-type: none"> <li>• Ensure there are no loose terminals.</li> <li>• Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Gauges and Tightening Torque on page 39</i></li> </ul>
There is a problem with the voltage from the drive input power.	<ul style="list-style-type: none"> <li>• Check the voltage.</li> <li>• Correct the voltage to within range listed in drive input power specifications.</li> </ul>
The power has been interrupted.	Correct the drive input power.
Drive internal circuitry has become worn.	<ul style="list-style-type: none"> <li>• Check the maintenance time for the capacitors (U4-05).</li> <li>• Replace the drive if U4-05 exceeds 90%.</li> </ul>

## 6.4 Fault Detection

The drive input power transformer is not large enough and voltage drops after switching on power.	Check the capacity of the drive input power transformer.
Air inside the drive is too hot.	Check the drive internal temperature.
Problem with the CHARGE indicator.	Replace the drive.
<b>LED Operator Display</b>	<b>Fault Name</b>
Uu3	Uv3
	Undervoltage 3 (Inrush Prevention Circuit Fault)
	The inrush prevention circuit has failed.
<b>Cause</b>	<b>Possible Solution</b>
The contactor on the inrush prevention circuit is damaged.	<ul style="list-style-type: none"> <li>• Cycle power to the drive. Check if the fault reoccurs.</li> <li>• Replace the drive if the fault continues to occur.</li> <li>• Check monitor U4-06 for the performance life of the inrush prevention circuit.</li> <li>• Replace the drive if U4-06 exceeds 90%.</li> </ul>



## 6.5 Alarm Detection

Alarms are drive protection functions that do not operate the fault contact. The drive will return to original status when the cause of the alarm has been removed.

During an alarm condition, the Digital Operator display flashes and an alarm output is generated at the multi-function output (H2-01), if programmed.

Investigate the cause of the alarm and refer to *Table 6.8* for the appropriate action.

### ◆ Alarm Codes, Causes, and Possible Solutions

**Table 6.8 Alarm Codes, Causes, and Possible Solutions**

LED Operator Display		Minor Fault Name	
bb	bb	Baseblock	
Cause		Possible Solutions	
External baseblock signal entered via multi-function input terminal (S1 to S5).		Check external sequence and baseblock signal input timing.	Minor Fault (H2-01 = 10) No output
LED Operator Display		Minor Fault Name	
CALL	CALL	Serial Communication Transmission Error	
Cause		Possible Solutions	
Communications wiring is faulty, there is a short circuit, or something is not connected properly.		<ul style="list-style-type: none"> <li>Check for wiring errors.</li> <li>Correct the wiring.</li> <li>Remove and ground shorts and reconnect loose wires.</li> </ul>	Minor Fault (H2-01 = 10) YES
Programming error on the master side.		Check communications at start-up and correct programming errors.	YES
Communications circuitry is damaged.		<ul style="list-style-type: none"> <li>Perform a self-diagnostics check.</li> <li>Replace the drive if the fault continues to occur.</li> </ul>	YES
Terminal resistance setting is incorrect.		The terminal slave drive must have the internal terminal resistance switch set correctly. Place DIP switch S2 to the ON position.	YES
LED Operator Display		Minor Fault Name	
CE	CE	MEMOBUS/Modbus Communication Error	
Cause		Possible Solutions	
A data error occurred due to noise.		<ul style="list-style-type: none"> <li>Check options available to minimize the effects of noise.</li> <li>Counteract noise in the control circuit wiring, main circuit lines and ground wiring.</li> <li>Reduce noise on the controller side.</li> <li>Use surge absorbers on magnetic contactors or other equipment causing the disturbance.</li> <li>Use cables recommended by Yaskawa or another type of shielded line. The shield should be grounded on the controller side or on the drive input power side.</li> <li>Separate all wiring for communications devices from drive input power lines. Install a noise filter to the input side of the drive input power.</li> </ul>	Minor Fault (H2-01 = 10) YES
Communication protocol is incompatible.		<ul style="list-style-type: none"> <li>Check the H5 parameter settings as well as the protocol setting in the controller.</li> <li>Ensure settings are compatible.</li> </ul>	YES
The communication cycle is longer than 2 seconds.		<ul style="list-style-type: none"> <li>Check the PLC.</li> <li>Change the software settings in the PLC.</li> </ul>	YES
Incompatible PLC software settings or there is a hardware problem.		<ul style="list-style-type: none"> <li>Check the PLC.</li> <li>Remove the cause of the error on the controller side.</li> </ul>	YES
Communications cable is disconnected or damaged.		<ul style="list-style-type: none"> <li>Check the connector for a signal through the cable.</li> <li>Replace the communications cable.</li> </ul>	YES
LED Operator Display		Minor Fault Name	
CrST	CrST	Can Not Reset	
Cause		Possible Solutions	
Fault reset was being executed when a run command was entered.		<ul style="list-style-type: none"> <li>Ensure that a run command cannot be entered from the external terminals or option unit during fault reset.</li> <li>Turn off the run command.</li> </ul>	Minor Fault Output (H2-01 = 10) YES
LED Operator Display		Minor Fault Name	
EF	EF	Forward/Reverse Run Command Input Error	
		Both forward run and reverse run closed simultaneously for over 0.5 s.	

## 6.5 Alarm Detection

Cause		Possible Solutions	Minor Fault Output (H2-01 = 10)
Sequence error		Check the forward and reverse command sequence and correct the problem. <b>Note:</b> When minor fault EF detected, motor ramps to stop.	YES
LED Operator Display		Minor Fault Name	
EF1	EF1	External fault (input terminal S1) External fault at multi-function input terminal S1.	
EF2	EF2	External fault (input terminal S2) External fault at multi-function input terminal S2.	
EF3	EF3	External fault (input terminal S3) External fault at multi-function input terminal S3.	
EF4	EF4	External fault (input terminal S4) External fault at multi-function input terminal S4.	
EF5	EF5	External fault (input terminal S5) External fault at multi-function input terminal S5.	
Cause		Possible Solutions	Minor Fault Output (H2-01 = 10)
An external device has tripped an alarm function.		Remove the cause of the external fault and reset the multi-function input value.	YES
Wiring is incorrect.		<ul style="list-style-type: none"> <li>Ensure the signal lines have been connected properly to the terminals assigned for external fault detection (H1-□□ = 20 to 2F).</li> <li>Reconnect the signal line.</li> </ul>	YES
Multi-function contact inputs are set incorrectly.		<ul style="list-style-type: none"> <li>Check if the unused terminals have been set for H1-□□ = 20 to 2F (External Fault).</li> <li>Change the terminal settings.</li> </ul>	YES
LED Operator Display		Minor Fault Name	
oH	oH	Heatsink Overheat The temperature exceeded 90-100 °C	
Cause		Possible Solutions	Minor Fault Output (H2-01 = 10)
Surrounding temperature is too high		<ul style="list-style-type: none"> <li>Check the surrounding temperature.</li> <li>Improve the air circulation within the enclosure panel.</li> <li>Install a fan or air conditioner to cool surrounding area.</li> <li>Remove anything near drive that may cause extra heat.</li> </ul>	YES
Internal cooling fan has stopped.		<ul style="list-style-type: none"> <li>Replace the cooling fan. <i>Refer to Cooling Fan Replacement on page 151.</i></li> <li>After replacing the drive, reset the cooling fan maintenance parameter to (o4-03 = "0").</li> </ul>	YES
Airflow around the drive is restricted.		<ul style="list-style-type: none"> <li>Provide proper installation space around the drive as indicated in the manual. <i>Refer to Correct Installation Orientation on page 27.</i></li> <li>Allow for the specified space and ensure that there is sufficient circulation around the control panel.</li> <li>Check for dust or foreign materials clogging cooling fan.</li> <li>Clear debris caught in the fan that restricts air circulation.</li> </ul>	YES
LED Operator Display		Minor Fault Name	
oL3	oL3	Overtorque 1 Drive output current was greater than L6-02 for longer than the time set in L6-03.	
Cause		Possible Solutions	Minor Fault Output (H2-01 = 10)
Inappropriate parameter settings.		Check parameters L6-02 and L6-03.	YES
There is a fault on the machine side (e.g., the machine is locked up).		<ul style="list-style-type: none"> <li>Check the status of the machine.</li> <li>Remove the cause of the fault.</li> </ul>	YES
LED Operator Display		Minor Fault Name	
ov	ov	DC Bus Overvoltage The DC bus voltage exceeded the trip point. For 200 V class: approximately 410 V For 400 V class: approximately 820 V (740 V when E1-01 < 400)	
Cause		Possible Solutions	Minor Fault Output (H2-01 = 10)
Surge voltage present in the drive input power.		<ul style="list-style-type: none"> <li>Install a DC reactor or an AC reactor.</li> <li>Voltage surge can result from a thyristor convertor and a phase advancing capacitor operating on the same drive input power system.</li> </ul>	YES
<ul style="list-style-type: none"> <li>The motor is short-circuited.</li> <li>Ground current has over-charged the main circuit capacitors via the drive input power.</li> </ul>		<ul style="list-style-type: none"> <li>Check the motor power cable, relay terminals and motor terminal box for short circuits.</li> <li>Correct grounding shorts and turn the power back on.</li> </ul>	YES

Noise interference causes the drive to operate incorrectly.	<ul style="list-style-type: none"> <li>Review possible solutions for handling noise interference.</li> <li>Review section on handling noise interference and check control circuit lines, main circuit lines and ground wiring.</li> <li>If the magnetic contactor is identified as a source of noise, install a surge protector to the MC coil.</li> </ul>	YES
	Set number of fault restarts (L5-01) to a value other than 0.	YES
<b>LED Operator Display</b>	<b>Minor Fault Name</b>	
PR55	PASS	MEMOBUS/Modbus Communication Test Mode Complete
<b>Cause</b>	<b>Possible Solutions</b>	<b>Minor Fault Output (H2-01 = 10)</b>
MEMOBUS/Modbus test has finished normally.	This verifies that the test was successful.	No output
<b>LED Operator Display</b>	<b>Minor Fault Name</b>	
5E	SE	MEMOBUS/Modbus Communication Test Mode Error
<b>Cause</b>	<b>Possible Solutions</b>	<b>Minor Fault Output (H2-01 = 10)</b>
A digital input programmed to 67H (MEMOBUS/Modbus test) was closed while the drive was running.	Stop the drive and run the test again.	No output
<b>LED Operator Display</b>	<b>Minor Fault Name</b>	
Uv	Uv	Undervoltage One of the following conditions was true when the drive was stopped and a run command was entered: <ul style="list-style-type: none"> <li>DC bus voltage dropped below the under voltage detection level.</li> <li>Contact to suppress inrush current in the drive was open.</li> <li>Low voltage in the control drive input power. This alarm outputs only if L2-01 is not 0 and DC bus voltage is below the detection level.</li> </ul>
<b>Cause</b>	<b>Possible Solutions</b>	<b>Minor Fault Output (H2-01 = 10)</b>
Phase loss in the drive input power.	Check for wiring errors in the main circuit drive input power. Correct the wiring.	YES
Loose wiring in the drive input power terminals.	<ul style="list-style-type: none"> <li>Ensure the terminals have been properly tightened.</li> <li>Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Gauges and Tightening Torque on page 39</i></li> </ul>	YES
There is a problem with the drive input power voltage.	<ul style="list-style-type: none"> <li>Check the voltage.</li> <li>Lower the voltage of the drive input power so that it is within the limits listed in the specifications.</li> </ul>	YES
Drive internal circuitry is worn.	<ul style="list-style-type: none"> <li>Check the maintenance time for the capacitors (U4-05).</li> <li>Replace the drive if U4-05 exceeds 90%.</li> </ul>	YES
The drive input power transformer is not large enough and voltage drops when the power is switched on.	<ul style="list-style-type: none"> <li>Check for a tripped alarm when the magnetic contactor, line breaker and leakage breaker are turned on.</li> <li>Check the capacity of the drive input power transformer.</li> </ul>	YES
Air inside the drive is too hot.	Check the temperature inside the drive.	YES
The CHARGE indicator light is broken or disconnected.	Replace the drive.	YES

