

## 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 80.*

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 6.4** 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 6.4 Types of Alarms, Faults, and Errors**

Type	Drive Responses to Alarms, Faults, and Errors
<b>Faults</b>	<p>When the drive detects a fault:</p> <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-□□ = E), it will close if a fault occurs.</li> </ul> <p>When the drive detects a fault, it will remain inoperable until that fault has been reset. <i>Refer to Fault Reset Methods on page 298.</i></p>
<b>Minor Faults and Alarms</b>	<p>When the drive detects an alarm or a minor fault:</p> <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>• One of the multi-function contact outputs closes if set to be tripped by a minor fault (H2-□□ = 10), but not by an alarm.</li> <li>• The digital operator displays text indicating a specific alarm and ALM indicator LED flashes.</li> </ul> <p>Remove the cause of an alarm or minor fault to automatically reset.</p>
<b>Operation Errors</b>	<p>When parameter settings conflict with one another or do not match hardware settings (such as with an option card), it results in an operation error.</p> <p>When the drive detects an operation error:</p> <ul style="list-style-type: none"> <li>• The digital operator displays text that indicates the specific error.</li> <li>• Multi-function contact outputs do not operate.</li> </ul> <p>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.</p>
<b>Tuning Errors</b>	<p>Tuning errors occur while performing Auto-Tuning.</p> <p>When the drive detects a tuning error:</p> <ul style="list-style-type: none"> <li>• The digital operator displays text indicating the specific error.</li> <li>• Multi-function contact outputs do not operate.</li> <li>• Motor coasts to stop.</li> <li>• Remove the cause of the error and repeat the Auto-Tuning process.</li> </ul>

### ◆ 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 265](#) 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 6.5 Fault Displays**

Digital Operator Display		Name	Pg.	Digital Operator Display		Name	Pg.
<i>bUS</i>	bUS	Option Communication Error	<a href="#">267</a>	<i>GF</i>	GF	Ground Fault	<a href="#">271</a>
<i>CE</i>	CE	MEMOBUS/Modbus Communication Error	<a href="#">267</a>	<i>LF</i>	LF	Output Phase Loss	<a href="#">272</a>
<i>CF</i>	CF	Control Fault	<a href="#">267</a>	<i>LF2</i>	LF2	Current Imbalance	<a href="#">272</a>
<i>CoF</i>	CoF	Current Offset Fault	<a href="#">267</a>	<i>nSE</i>	nSE	Node Setup Error	<a href="#">272</a>
<i>CPF02</i>	CPF02	A/D Conversion Error	<a href="#">268</a>	<i>oC</i>	oC	Overcurrent	<a href="#">272</a>
<i>CPF03</i>	CPF03	PWM Data Fault	<a href="#">268</a>	<i>oFAD0 &lt;3&gt;</i>	oFA00	Option Card Connection Error	<a href="#">273</a>
<i>CPF06</i>	CPF06	Drive Specification Mismatch during Terminal Board or Control Board Replacement	<a href="#">268</a>	<i>oFAD1 &lt;3&gt;</i>	oFA01	Option Unit Fault	<a href="#">273</a>
<i>CPF07</i>	CPF07	Terminal Board Communication Fault	<a href="#">268</a>	<i>oFAD3</i>	oFA03	Option Card Fault	<a href="#">273</a>
<i>CPF08</i>	CPF08	EEPROM Serial Communications Fault	<a href="#">268</a>	<i>oFAD4</i>	oFA04	Option Card Fault	<a href="#">273</a>
<i>CPF11</i>	CPF11	RAM Fault	<a href="#">268</a>	<i>oFAD3 to oFAD4</i>	oFA30 to oFA43	Option Card Fault	<a href="#">273</a>
<i>CPF12</i>	CPF12	FLASH Memory Fault	<a href="#">268</a>	<i>oH</i>	oH	Heatsink Overheat	<a href="#">274</a>
<i>CPF13</i>	CPF13	Watchdog Circuit Exception	<a href="#">269</a>	<i>oH1</i>	oH1	Heatsink Overheat	<a href="#">274</a>
<i>CPF14</i>	CPF14	Control Circuit Fault	<a href="#">269</a>	<i>oH3</i>	oH3	Motor Overheat 1 (PTC input)	<a href="#">274</a>
<i>CPF16</i>	CPF16	Clock Fault	<a href="#">269</a>	<i>oH4</i>	oH4	Motor Overheat 2 (PTC input)	<a href="#">275</a>
<i>CPF17</i>	CPF17	Timing Fault	<a href="#">269</a>	<i>oL1</i>	oL1	Motor Overload	<a href="#">275</a>
<i>CPF18</i>	CPF18	Control Circuit Fault	<a href="#">269</a>	<i>oL2</i>	oL2	Drive Overload	<a href="#">275</a>
<i>CPF19</i>	CPF19	Control Circuit Fault	<a href="#">269</a>	<i>oL3</i>	oL3	Overtorque Detection 1	<a href="#">276</a>
<i>CPF20 or CPF21 &lt;1&gt;</i>	CPF20 or CPF21	RAM Fault	<a href="#">269</a>	<i>oL4</i>	oL4	Overtorque Detection 2	<a href="#">276</a>
		FLASH Memory Fault	<a href="#">269</a>	<i>oL5</i>	oL5	Mechanical Weakening Detection 1	<a href="#">276</a>
		Watchdog Circuit Exception	<a href="#">269</a>	<i>oL7</i>	oL7	High Slip Braking oL	<a href="#">276</a>
		Clock Fault	<a href="#">269</a>	<i>oPr</i>	oPr	Operator Connection Fault	<a href="#">277</a>
<i>CPF22</i>	CPF22	A/D Conversion Error	<a href="#">269</a>	<i>oS</i>	oS	Overspeed (for Simple V/f with PG)	<a href="#">277</a>
<i>CPF23</i>	CPF23	PWM Feedback Data Fault	<a href="#">269</a>	<i>ov</i>	ov	Overvoltage	<a href="#">277</a>
<i>CPF24</i>	CPF24	Drive Capacity Signal Fault	<a href="#">270</a>	<i>PF</i>	PF	Input Phase Loss	<a href="#">278</a>
<i>CPF25</i>	CPF25	Terminal Board Not Connected	<a href="#">270</a>	<i>PGo</i>	PGo	PG Disconnect (for Simple V/f with PG)	<a href="#">278</a>
<i>dEv</i>	dEv	Excessive Speed Deviation (for Simple V/f with PG)	<a href="#">270</a>	<i>rH</i>	rH	Dynamic Braking Resistor	<a href="#">278</a>
<i>dWAL</i>	dWAL	DriveWorksEZ Program Error Output	<a href="#">270</a>	<i>rr</i>	rr	Dynamic Braking Transistor	<a href="#">279</a>
<i>dWFL</i>	dWFL	DriveWorksEZ Fault	<a href="#">270</a>	<i>SC &lt;2&gt;</i>	SC	IGBT Short Circuit	<a href="#">279</a>
<i>E5</i>	E5	MECHATROLINK Watchdog Timer Error	<a href="#">270</a>	<i>SEr</i>	SEr	Too Many Speed Search Restarts	<a href="#">279</a>
<i>EF0</i>	EF0	Option External Fault	<a href="#">270</a>	<i>STo</i>	STo	Pull-Out Detection	<a href="#">279</a>
<i>EF1 to EF7</i>	EF1 to EF7	External Fault (input terminal S1 to S7)	<a href="#">270</a>	<i>UL3</i>	UL3	Undertorque Detection 1	<a href="#">279</a>
<i>Err</i>	Err	EEPROM Write Error	<a href="#">271</a>	<i>UL4</i>	UL4	Undertorque Detection 2	<a href="#">280</a>
<i>FbH</i>	FbH	Excessive PID Feedback	<a href="#">271</a>	<i>UL5</i>	UL5	Mechanical Weakening Detection 2	<a href="#">280</a>
<i>FbL</i>	FbL	PID Feedback Loss	<a href="#">271</a>	<i>Uv1 &lt;3&gt;</i>	Uv1	Undervoltage	<a href="#">280</a>
				<i>Uv2 &lt;3&gt;</i>	Uv2	Control Power Supply Undervoltage	<a href="#">280</a>
				<i>Uv3</i>	Uv3	Soft Charge Circuit Fault	<a href="#">280</a>

- <1> Displayed as  $\overline{CPF20}$  when occurring at drive power up. When one of the faults occurs after successfully starting the drive, the display will show  $\overline{CPF21}$ .
- <2> Available in drive software versions PRG: 1020 and later.
- <3> Uv1 and Uv2 faults are not saved to the fault history

**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 282.* 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 6.6 Minor Fault and Alarm Displays**

Digital Operator Display		Name	Minor Fault Output (H2-□□ = 10)	Pg.
$\overline{AEr}$	AEr	Station Address Setting Error (CC-Link, CANopen, MECHATROLINK)	YES	282
$\overline{bb}$	bb	Drive Baseblock	No output	282
$\overline{bUS}$	bUS	Option Card Communications Error	YES	282
$\overline{CALL}$	CALL	Serial Communication Transmission Error	YES	282
$\overline{CE}$	CE	MEMOBUS/Modbus Communication Error	YES	283
$\overline{CrST}$	CrST	Can Not Reset	YES	283
$\overline{CyC}$	CyC	MECHATROLINK Comm. Cycle Setting Error	YES	283
$\overline{dEv}$	dEv	Excessive Speed Deviation (for Simple V/f with PG)	YES	283
$\overline{dnE}$	dnE	Drive Disabled	YES	284
$\overline{dWAL}$	dWAL	DriveWorksEZ Alarm	YES	270
$\overline{E5}$	E5	MECHATROLINK Watchdog Timer Error	YES	284
$\overline{EF}$	EF	Run Command Input Error	YES	284
$\overline{EF0}$	EF0	Option Card External Fault	YES	284
$\overline{EF1}$ to $\overline{EF7}$	EF1 to EF7	External Fault (input terminal S1 to S7)	YES	284
$\overline{FbH}$	FbH	Excessive PID Feedback	YES	285
$\overline{FbL}$	FbL	PID Feedback Loss	YES	285
$\overline{Hbb}$	Hbb	Safe Disable Signal Input	YES	285
$\overline{HbbF}$	HbbF	Safe Disable Signal Input	YES	285
$\overline{HCA}$	HCA	Current Alarm	YES	285
$\overline{LT-1}$	LT-1	Cooling Fan Maintenance Alarm	No output </>	286
$\overline{LT-2}$	LT-2	Capacitor Maintenance Alarm	No output </>	286
$\overline{LT-3}$	LT-3	Soft Charge Bypass Relay Maintenance Time	No output </>	286
$\overline{LT-4}$	LT-4	IGBT Maintenance Time (50%)	No output </>	286
$\overline{oH}$	oH	Heatsink Overheat	YES	286
$\overline{oH2}$	oH2	Drive Overheat	YES	287
$\overline{oH3}$	oH3	Motor Overheat	YES	287
$\overline{oL3}$	oL3	Overtorque 1	YES	287
$\overline{oL4}$	oL4	Overtorque 2	YES	287
$\overline{oL5}$	oL5	Mechanical Weakening Detection 1	YES	288
$\overline{oS}$	oS	Overspeed (for Simple V/f with PG)	YES	288
$\overline{ov}$	ov	Overvoltage	YES	288
$\overline{PASS}$	PASS	MEMOBUS/Modbus Test Mode Complete	No output	288
$\overline{PGo}$	PGo	PG Disconnect (for Simple V/f with PG)	YES	288
$\overline{rUn}$	rUn	During Run 2, Motor Switch Command Input	YES	289

## 6.3 Drive Alarms, Faults, and Errors

Digital Operator Display		Name	Minor Fault Output (H2-□□ = 10)	Pg.
SE	SE	MEMOBUS/Modbus Test Mode Fault	YES	289
TrPC	TrPC	IGBT Maintenance Time (90%)	YES	289
UL3	UL3	Undertorque 1	YES	289
UL4	UL4	Undertorque 2	YES	289
UL5	UL5	Mechanical Weakening Detection 2	YES	280
Uv	Uv	Undervoltage	YES	290

<1> Output when H2-□□ = F

### ■ Operation Errors

Table 6.7 Operation Error Displays

Digital Operator Display	Name	Pg.	Digital Operator Display	Name	Pg.
oPE01	oPE01	Drive Unit Setting Error	oPE08	oPE08	Parameter Selection Error
oPE02	oPE02	Parameter Setting Range Error	oPE09	oPE09	PID Control Selection Error
oPE03	oPE03	Multi-Function Input Setting Error	oPE10	oPE10	V/f Data Setting Error
oPE04	oPE04	Terminal Board Mismatch Error	oPE11	oPE11	Carrier Frequency Setting Error
oPE05	oPE05	Run Command Selection Error	oPE13	oPE13	Pulse Train Monitor Selection Error
oPE07	oPE07	Multi-Function Analog Input Selection Error			

### ■ Auto-Tuning Errors

Table 6.8 Auto-Tuning Error Displays

Digital Operator Display	Name	Pg.	Digital Operator Display	Name	Pg.
End1	End1	Excessive V/f Setting	Er-04	Er-04	Line-to-Line Resistance Error
End2	End2	Motor Iron Core Saturation Coefficient Error	Er-05	Er-05	No-Load Current Error
End3	End3	Rated Current Setting Alarm	Er-08	Er-08	Rated Slip Error
Er-01	Er-01	Motor Data Error	Er-09	Er-09	Acceleration Error
Er-02	Er-02	Alarm	Er-11	Er-11	Motor Speed Error
Er-03	Er-03	STOP button Input	Er-12	Er-12	Current Detection Error

## 6.4 Fault Detection

### ◆ Fault Displays, Causes, and Possible Solutions

Table 6.9 Detailed Fault Displays, Causes, and Possible Solutions

Digital Operator Display		Fault Name
<i>bUS</i>	bUS	Option Communication Error
		<ul style="list-style-type: none"> <li>• After establishing initial communication, the connection was lost.</li> <li>• Only detected when the run command frequency reference is assigned to an option card.</li> </ul>
<b>Cause</b>		<b>Possible Solution</b>
No signal received from the PLC.		<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>
The communication cable is faulty or a short circuit exists.		
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>• Ensure that other equipment such as switches or relays do not cause noise and use surge suppressors if required.</li> <li>• Use cables recommended by Yaskawa or another type of shielded line. Ground the shield 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 an EMC noise filter to the input side of the drive input power.</li> </ul>
The option card is damaged.		<ul style="list-style-type: none"> <li>• Replace the option card if there are no problems with the wiring and the error continues to occur.</li> </ul>
The option card is not properly connected to the drive.		<ul style="list-style-type: none"> <li>• The connector pins on the option card are not properly lined up with the connector pins on the drive.</li> <li>• Reinstall the option card.</li> </ul>

Digital Operator Display		Fault Name
<i>CE</i>	CE	MEMOBUS/Modbus Communication Error
		Control data was not received for the CE detection time set to H5-09.
<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 an EMC noise filter to the input side of the drive input power.</li> </ul>

Digital Operator Display		Fault Name
<i>CF</i>	CF	Control Fault
		A torque limit was reached continuously for three seconds or longer during a ramp to stop while in Open Loop Vector Control.
<b>Cause</b>		<b>Possible Solution</b>
Motor parameters are not set properly.		Check the motor parameter settings and repeat Auto-Tuning.
Torque limit is too low.		Set the torque limit to the most appropriate setting (L7-01 through L7-04).
Load inertia is too big.		<ul style="list-style-type: none"> <li>• Adjust the deceleration time (C1-02, -04, -06, -08).</li> <li>• Set the frequency to the minimum value and interrupt the run command when the drive finishes decelerating.</li> </ul>

Digital Operator Display		Fault Name
<i>CoF</i>	CoF	Current Offset Fault
		The current sensor is damaged or there was residual induction current in the motor (e.g., during sudden deceleration or when coasting) when the drive attempted to start the motor.
<b>Cause</b>		<b>Possible Solution</b>

## 6.4 Fault Detection

Digital Operator Display	Fault Name
Due to residual induction current in the motor when the drive attempted to start the motor, the drive attempted to adjust the current offset value beyond the allowable range.	<ul style="list-style-type: none"> <li>• Create a motor restart sequence that allows enough time for the residual induction voltage to dissipate.</li> <li>• Enable Speed Search at start (b3-01 = 1). Use the multi-function terminals to execute External Speed Search 1 and 2 (H1-□□ = 61 or 62).</li> </ul> <p><b>Note:</b> When using a PM motor, both External Speed Search 1 and 2 perform the same operation.</p>

Digital Operator Display	Fault Name
<i>CPF02</i>   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>

Digital Operator Display	Fault Name
<i>CPF03</i>   CPF03	PWM Data Error There is a problem with the PWM data.
<b>Cause</b>	<b>Possible Solution</b>
Drive hardware is damaged.	Replace the drive.

Digital Operator Display	Fault Name
<i>CPF06</i>   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 a communications option card).	<ul style="list-style-type: none"> <li>• Cycle power to the drive and check operation again.</li> <li>• Initialize the drive using A1-03.</li> <li>• If the problem persists after initializing the drive, replace the drive.</li> </ul>

Digital Operator Display	Fault Name
<i>CPF07</i>   CPF07	Terminal Board Communications Error A communication error occurred at the terminal board.
<b>Cause</b>	<b>Possible Solution</b>
There is a fault connection between the terminal board and control board.	Turn the power off and reconnect the control circuit terminals.

Digital Operator Display	Fault Name
<i>CPF08</i>   CPF08	EEPROM Serial Communication Fault EEPROM communications are not functioning properly.
<b>Cause</b>	<b>Possible Solution</b>
Terminal board or control board is not connected properly.	Turn the power off and check the control terminal connections.

Digital Operator Display	Fault Name
<i>CPF11</i>   CPF11	RAM Fault
<b>Cause</b>	<b>Possible Solution</b>
Hardware is damaged.	Replace the drive.

Digital Operator Display	Fault Name
<i>CPF12</i>   CPF12	FLASH Memory Fault Problem with the ROM (FLASH memory).
<b>Cause</b>	<b>Possible Solution</b>
Hardware is damaged.	Replace the drive.

Digital Operator Display		Fault Name
[PF13]	CPF13	Watchdog Circuit Exception Self-diagnostics problem.
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF14]	CPF14	Control Circuit Fault CPU error (CPU operates incorrectly due to noise, etc.)
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF16]	CPF16	Clock Fault Standard clock error.
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF17]	CPF17	Timing Fault A timing error occurred during an internal process.
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF18]	CPF18	Control Circuit Fault CPU error. Non-Maskable Interrupt (An unusual interrupt was triggered by noise, etc.)
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF19]	CPF19	Control Circuit Fault CPU error (Manual reset due to noise, etc.)
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
[PF20] or [PF21]	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>
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital 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 298.</i></li> <li>• If the problem continues, replace the drive.</li> </ul>

Digital Operator Display		Fault Name
[PF23]	CPF23	PWM Feedback Fault PWM feedback error.

## 6.4 Fault Detection

Digital Operator Display		Fault Name
Cause		Possible Solution
Hardware is damaged.		Replace the drive.

Digital Operator Display		Fault Name
<i>CPF24</i>	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.

Digital Operator Display		Fault Name
<i>CPF25</i>	CPF25	Terminal Board Not Connected
Cause		Possible Solution
Terminal board is not connected correctly.		Reconnect the terminal board to the connector on the drive, then cycle the power to the drive.

Digital Operator Display		Fault Name
<i>dEv</i>	dEv	Speed Deviation (for Simple V/f with PG)
		According to the pulse input (RP), the speed deviation is greater than the setting in F1-10 for longer than the time set to F1-11.
Cause		Possible Solution
Load is too heavy.		Reduce the load.
Acceleration and deceleration times are set too short.		Increase the acceleration and deceleration times (C1-01 through C1-08).
The load is locked up.		Check the machine.
Parameters are not set appropriately.		Check the settings of parameters F1-10 and F1-11.
Motor brake engaged.		Ensure the motor brake releases properly.

Digital Operator Display		Fault Name
<i>dWFL</i>	dWFL	DriveWorksEZ Fault
<i>dWAL</i>	dWAL	DriveWorksEZ Program Error Output
Cause		Possible Solution
Fault output by DriveWorksEZ		Correct the cause of the fault.

Digital Operator Display		Fault Name
<i>E5</i>	E5	MECHATROLINK Watchdog Timer Error
		The watchdog timed out.
Cause		Possible Solution
Data has not been received from the PLC, triggering the watchdog timer.		Execute DISCONNECT or ALM_CLR, then issue a CONNECT command or SYNC_SET command and proceed to phase 3.

Digital Operator Display		Fault Name
<i>EF0</i>	EF0	Option Card External Fault
		An external fault condition is present.
Cause		Possible Solution
An external fault was received from the PLC with other than F6-03 = 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.

Digital Operator Display		Fault Name
<i>EF1</i>	EF1	External Fault (input terminal S1)
		External fault at multi-function input terminal S1.
<i>EF2</i>	EF2	External Fault (input terminal S2)
		External fault at multi-function input terminal S2.
<i>EF3</i>	EF3	External Fault (input terminal S3)
		External fault at multi-function input terminal S3.

Digital Operator Display		Fault Name
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.
EF6	EF6	External Fault (input terminal S6)
		External fault at multi-function input terminal S6.
EF7	EF7	External Fault (input terminal S7)
		External fault at multi-function input terminal S7
<b>Cause</b>		<b>Possible Solution</b>
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>

Digital Operator Display		Fault Name
Err	Err	EEPROM Write Error
		Data does not match the EEPROM being written to.
<b>Cause</b>		<b>Possible Solution</b>
-		<ul style="list-style-type: none"> <li>Press the ENTER button.</li> <li>Correct the parameter settings.</li> <li>Cycle power to the drive. <i>Refer to Diagnosing and Resetting Faults on page 298.</i></li> </ul>

Digital Operator Display		Fault Name
FbH	FbH	Excessive PID Feedback
		PID feedback input is greater than the level set b5-36 for longer than the time set to b5-37. Set b5-12 to 2 or 5 to enable fault detection.
<b>Cause</b>		<b>Possible Solution</b>
Parameters are not set appropriately.		Check the settings of parameters b5-36 and b5-37.
Wiring for PID feedback is incorrect.		Correct the wiring.
There is a problem with the feedback sensor.		<ul style="list-style-type: none"> <li>Check the sensor on the control side.</li> <li>Replace the sensor if damaged.</li> </ul>

Digital Operator Display		Fault Name
FbL	FbL	PID Feedback Loss
		This fault occurs when PID Feedback Loss Detection is programmed to fault (b5-12 = 2) and the PID Feedback < PID Feedback Loss Detection Level (b5-13) for the PID Feedback Loss Detection Time (b5-14).
<b>Cause</b>		<b>Possible Solution</b>
Parameters are not set appropriately.		Check the settings of parameters b5-13 and b5-14.
Wiring for PID feedback is incorrect.		Correct the wiring.
There is a problem with the feedback sensor.		Check the sensor on the controller side. If damaged, replace the sensor.

Digital Operator Display		Fault Name
GF	GF	Ground Fault
		<ul style="list-style-type: none"> <li>Current shorted to ground exceeded 50% of rated current on output side of the drive.</li> <li>Setting L8-09 to 1 enables ground fault detection in models 2A0020 to 2A0069 and 4A0011 to 4A0038.</li> </ul>
<b>Cause</b>		<b>Possible Solution</b>
Motor insulation is damaged.		<ul style="list-style-type: none"> <li>Check the insulation resistance of the motor.</li> <li>Replace the motor.</li> </ul>

## 6.4 Fault Detection

Digital Operator Display	Fault Name
A damaged motor cable is creating a short circuit.	<ul style="list-style-type: none"> <li>Check the motor cable.</li> <li>Remove the short circuit and turn the power back on.</li> </ul>
The leakage current at the drive output is too high.	<ul style="list-style-type: none"> <li>Check the resistance between the cable and the ground terminal ⊕.</li> <li>Replace the cable.</li> </ul>
The drive started to run during Current Offset Fault or while coasting to a stop.	<ul style="list-style-type: none"> <li>Reduce the carrier frequency.</li> <li>Reduce the amount of stray capacitance.</li> <li>The value set exceeds the allowable setting range while the drive automatically adjusts the current offset (this happens only attempting to restart a PM motor that is coasting to stop).</li> <li>Enable Speed Search at start (b3-01 = 1).</li> <li>Perform Speed Search 1 or 2 (H1-□□ = 61 or 62) via one of the external terminals. <b>Note:</b> Speed Search 1 and 2 are the same when using OLV/PM control mode.</li> </ul>
Hardware problem.	<ul style="list-style-type: none"> <li>Replace the drive.</li> </ul>

Digital Operator Display	Fault Name
LF	Output Phase Loss
LF	<ul style="list-style-type: none"> <li>Phase loss on the output side of the drive.</li> <li>Phase Loss Detection is enabled when L8-07 is set to 1 or 2.</li> </ul>
<b>Cause</b>	<b>Possible Solution</b>
The output cable is disconnected.	<ul style="list-style-type: none"> <li>Check for wiring errors and ensure the output cable is connected properly.</li> <li>Correct the wiring.</li> </ul>
The motor winding is damaged.	<ul style="list-style-type: none"> <li>Check the resistance between motor lines.</li> <li>Replace the motor if the winding is damaged.</li> </ul>
The output terminal is loose.	<ul style="list-style-type: none"> <li>Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Size and Torque Specifications on page 66.</i></li> </ul>
The motor being used is less than 5% of the drive rated current.	Check the drive and motor capacities.
An output transistor is damaged.	Replace the drive.
A single-phase motor is being used.	The drive being used cannot operate a single phase motor.

Digital Operator Display	Fault Name
LF2	Output current imbalance
LF2	One or more of the phases in the output current is lost.
<b>Cause</b>	<b>Possible Solution</b>
Phase loss has occurred on the output side of the drive.	<ul style="list-style-type: none"> <li>Check for faulty wiring or poor connections on the output side of the drive.</li> <li>Correct the wiring.</li> </ul>
Terminal wires on the output side of the drive are loose.	Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Size and Torque Specifications on page 66.</i>
No signal displays from the gate driver board.	Replace the drive. Contact Yaskawa for assistance.
Motor impedance or motor phases are uneven.	<ul style="list-style-type: none"> <li>Measure the line-to-line resistance for each motor phase. Ensure all values are the same.</li> <li>Replace the motor. Contact Yaskawa for assistance.</li> </ul>

Digital Operator Display	Fault Name
nSE	Node Setup Error
nSE	A terminal assigned to the node setup function closed during Run.
<b>Cause</b>	<b>Possible Solution</b>
The node setup terminal closed during Run.	<ul style="list-style-type: none"> <li>Check whether a Run command was accidentally entered via the terminals or from a comm. option unit.</li> <li>Turn off the Run command when using the node setup function.</li> </ul>
A Run command was issued while the node setup function was active.	

Digital Operator Display	Fault Name
oC	Overcurrent
oC	Drive sensors have detected an output current greater than the specified overcurrent level.
<b>Cause</b>	<b>Possible Solution</b>
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>

Digital Operator Display	Fault Name
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> </ul>
	<ul style="list-style-type: none"> <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, C1-03, C1-05, C1-07)</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. Set E3-04 through E3-10 when using a second motor.</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>Set b3-01 to 1 to enable Speed Search at Start.</li> <li>Program the Speed Search command input through one of the multi-function contact input terminals (H1-□□ = "61" or "62").</li> </ul>
The wrong motor code has been entered for in OLV/PM (Yaskawa motors only).	Enter the correct motor code to E5-01 to indicate that a PM motor is connected.
The motor control method and motor do not match.	<p>Check which motor control method the drive is set to in A1-02.</p> <ul style="list-style-type: none"> <li>For IM motors, set A1-02 to 0 or 2.</li> <li>For PM motors, set A1-02 to 5.</li> </ul>
The motor cable is too long	Use a larger drive.

Digital Operator Display	Fault Name
<i>oFR00</i>	oFA00
	Option Card Connection Error at Option Port CN5
	The option card is incompatible with the drive.
<b>Cause</b>	<b>Possible Solution</b>
The option card is incompatible with the drive.	Use a compatible option card.

Digital Operator Display	Fault Name
<i>oFR01</i>	oFA01
	Option Card Fault
	Replace the option card.
<b>Cause</b>	<b>Possible Solution</b>
The option card is not connected properly to the drive.	Turn the power off and reconnect the option card.

Digital Operator Display	Fault Name
<i>oFR03</i>	oFA03
	Option Card Fault
	Option card self-diagnostic error

## 6.4 Fault Detection

Digital Operator Display		Fault Name
oFR04	oFA04	Option Card Fault
		An error occurred attempting to write to the option card memory.
oFR30 to oFR43	oFA30 to oFA43	Option Card Fault
		Communication ID error
<b>Cause</b>		<b>Possible Solution</b>
Option card or hardware is damaged.		Replace the option card. Contact Yaskawa for consultation.

Digital Operator Display		Fault Name
oH	oH	Heatsink Overheat
		The temperature of the heatsink exceeded the value set to L8-02. Default value for L8-02 is determined by drive capacity (o2-04).
<b>Cause</b>		<b>Possible Solution</b>
Surrounding temperature is too high.		<ul style="list-style-type: none"> <li>• Check the temperature surrounding the drive. Verify temperature is within drive specifications.</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>• Decrease the load.</li> <li>• Lower the carrier frequency in C6-02.</li> </ul>
Internal cooling fan is stopped.		<ul style="list-style-type: none"> <li>• After replacing the fan, set o4-03 to 0 to reset cooling fan maintenance.</li> </ul>

Digital Operator Display		Fault Name
oH1	oH1	Overheat 1 (Heatsink Overheat)
		The temperature of the heatsink has exceeded 10 °C plus the default value of L8-02.
<b>Cause</b>		<b>Possible Solution</b>
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>
The internal cooling fan has reached its performance life or has malfunctioned.		<ul style="list-style-type: none"> <li>• Check the maintenance time for the cooling fan (U4-04).</li> <li>• After replacing the fan, set o4-03 to 0 to reset cooling fan maintenance.</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>

Digital Operator Display		Fault Name
oH3	oH3	Motor Overheat Alarm (PTC Input)
		<ul style="list-style-type: none"> <li>• The motor overheat signal to analog input terminal A1 or A2 exceeded the alarm detection level.</li> <li>• Detection requires multi-function analog input H3-02 or H3-10 be set to E.</li> </ul>
		<b>Possible Solution</b>
<b>Cause</b>		<b>Possible Solution</b>
Motor has overheated		<ul style="list-style-type: none"> <li>• Check the size of the load, the accel/decel times and the cycle times.</li> <li>• Decrease the load.</li> <li>• Increase the acceleration and deceleration times (C1-01 through C1-08).</li> <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, as this reduces load tolerance at low speeds.</li> <li>• Check the motor-rated current.</li> <li>• Enter the motor-rated current as indicated on the motor nameplate (E2-01).</li> <li>• Ensure the motor cooling system is operating normally.</li> <li>• Repair or replace the motor cooling system.</li> </ul>

Digital Operator Display		Fault Name
oH4	oH4	Motor Overheat Fault (PTC Input)
		<ul style="list-style-type: none"> <li>The motor overheat signal to analog input terminal A1 or A2 exceeded the fault detection level.</li> <li>Detection requires multi-function analog input H3-02 or H3-10 be set to E.</li> </ul>
<b>Cause</b>		<b>Possible Solution</b>
Motor has overheated.		<ul style="list-style-type: none"> <li>Check the size of the load, the accel/decel times and the cycle times.</li> <li>Decrease the load.</li> <li>Increase the acceleration and deceleration times (C1-01 through C1-08).</li> </ul>
		<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. Be careful not to lower E1-08 and E1-10 excessively because this reduces load tolerance at low speeds</li> <li>Check the motor-rated current.</li> <li>Enter the motor-rated current as indicated on the motor nameplate (E2-01).</li> <li>Ensure the motor cooling system is operating normally.</li> <li>Repair or replace the motor cooling system.</li> </ul>

Digital Operator Display		Fault Name
oL1	oL1	Motor Overload
		The electrothermal sensor tripped overload protection.
		<b>Note:</b> The U4-16 value must be less than 100 before oL1 can be reset.
<b>Cause</b>		<b>Possible Solution</b>
Cycle times are too short during acceleration and deceleration.		Increase the acceleration and deceleration times (C1-01 through C1-08).
<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 to 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 motor base 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>
Multiple motors are running off the same drive.		Set L1-01 to 0 to disable the Motor Protection function 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 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>
Speed Search related parameters are not set to the proper values.		<ul style="list-style-type: none"> <li>Check values set to Speed Search related parameters.</li> <li>Adjust the Speed Search current and Speed Search deceleration times (b3-02 and b3-03 respectively).</li> <li>After Auto-Tuning, enable Speed Estimation Type Search (b3-24 = "1").</li> </ul>
Output current fluctuation due to input phase loss		Check the power supply for phase loss.

Digital Operator Display		Fault Name
oL2	oL2	Drive Overload
		The thermal sensor of the drive triggered overload protection.

## 6.4 Fault Detection

Digital Operator Display	Fault Name
Cause	Possible Solution
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 C1-08).
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.
Speed Search related parameters are not set correctly.	<ul style="list-style-type: none"> <li>Check the settings for all Speed Search related parameters.</li> <li>Adjust the current used during Speed Search and the Speed Search deceleration time (b3-03 and b3-02 respectively).</li> <li>After Auto-Tuning the drive, enable the Speed Search Estimation Type (b3-24 = "1").</li> </ul>
Output current fluctuation due to input phase loss	Check the power supply for phase loss.

Digital Operator Display	Fault Name
oL3	Overtorque Detection 1
	The current has exceeded the value set for torque detection (L6-02) for longer than the allowable time (L6-03).
Cause	Possible Solution
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.

Digital Operator Display	Fault Name
oL4	Overtorque Detection 2
	The current has exceeded the value set for Overtorque Detection 2 (L6-05) for longer than the allowable time (L6-06).
Cause	Possible Solution
Parameter settings are not appropriate for the type of load.	Check the settings of parameters L6-05 and L6-06.

Digital Operator Display	Fault Name
oL5	Mechanical Weakening Detection 1
	Overtorque occurred, matching the conditions specified in L6-08.
Cause	Possible Solution
Overtorque occurred, triggering the mechanical weakening level set to L6-08.	Check for the cause of mechanical weakening.

Digital Operator Display	Fault Name
oL7	High-Slip Braking oL
	The output frequency stayed constant for longer than the time set in n3-04 during High-slip Braking.
Cause	Possible Solution
Excessive load inertia.	<ul style="list-style-type: none"> <li>Reduce deceleration times using parameters C1-02, C1-04, C1-06 and C1-08 in applications that do not use High-slip Braking.</li> <li>Use a braking resistor to shorten deceleration time.</li> </ul>
Motor is driven by the load.	
Something on the load side is restricting deceleration.	<ul style="list-style-type: none"> <li>Increase parameter n3-04 (High-slip Braking Overload Time).</li> <li>Install a thermal relay and increase the parameter setting of n3-04 to the maximum value.</li> </ul>
The overload time during High-slip Braking is too short.	

Digital Operator Display		Fault Name
oPr	oPr	External Digital Operator Connection Fault <ul style="list-style-type: none"> <li>The external operator has been disconnected from the drive.</li> </ul> <b>Note:</b> An oPr fault will occur when all 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>Cause</b>		<b>Possible Solution</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>

Digital Operator Display		Fault Name
oS	oS	Overspeed (Simple V/f with PG) Pulse input (RP) indicates that motor speed feedback exceeded F1-08 setting.
<b>Cause</b>		<b>Possible Solution</b>
Overshoot or undershoot is occurring.		<ul style="list-style-type: none"> <li>Adjust the gain by using the pulse train input parameters (H6-02 through H6-05).</li> <li>Increase the settings for C5-01 (Speed Control Proportional Gain 1) and reduce C5-02 (Speed Control Integral Time 1).</li> </ul>
Incorrect PG pulse settings.		Set the H6-02 (Pulse Train Input Scaling) = 100%, the frequency of the PG pulses at maximum motor speed.
Inappropriate parameter settings.		Check the setting for the overspeed detection level and the overspeed detection time (F1-08 and F1-09).

Digital Operator Display		Fault Name
ov	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>Cause</b>		<b>Possible Solution</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, C1-04, C1-06, C1-08).</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>
Fast acceleration time causes the motor to overshoot the speed reference.		<ul style="list-style-type: none"> <li>Check if sudden drive acceleration triggers an overvoltage alarm.</li> <li>Increase the acceleration time.</li> <li>Use longer S-curve acceleration and deceleration times.</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 link choke. <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>
Improper Setting of Speed Search related parameters. (Includes Speed Search after a momentary power loss and after a fault restart.)		<ul style="list-style-type: none"> <li>Check the settings for Speed Search related parameters.</li> <li>Enable Speed Search Retry function (b3-19 greater than or equal to 1 to 10).</li> <li>Adjust the current level during Speed Search and the deceleration time (b3-02 and b3-03 respectively).</li> <li>Perform Line-to-Line Resistance Auto-Tuning and then enable Speed Estimation Type Speed Search (b3-24 = 1).</li> </ul>
Excessive regeneration when overshoot occurs after acceleration.		<ul style="list-style-type: none"> <li>Enable the Overvoltage Suppression function (L3-11 = 1).</li> <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>

## 6.4 Fault Detection

Digital Operator Display	Fault Name
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>
Load inertia has been set incorrectly.	<ul style="list-style-type: none"> <li>Check the load inertia settings when using KEB, overvoltage suppression or Stall Prevention during deceleration.</li> <li>Adjust L3-25 (Load Inertia Ratio) in accordance with the load.</li> </ul>
Braking function is being used in PM Open Loop Vector Control.	Connect a braking resistor.
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> <li>Adjust the AFR time constant 1 (n2-02) and the AFR time constant 2 (n2-03) when in OLV Control.</li> <li>Use parameters n8-45 (PM Speed Feedback Detection Suppression Gain) and n8-47 (Pull-In Current Compensation Time Constant).</li> </ul>

Digital Operator Display	Fault Name
$PF$	PF
	Input Phase Loss
	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 Torques on page 58</i> for details.</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>

Digital Operator Display	Fault Name
$PGo$	PGo
	PG Disconnect (for Simple V/f with PG)
	No PG pulses are received for longer than the time set to F1-14.
<b>Cause</b>	<b>Possible Solution</b>
Pulse input (RP) is disconnected.	Reconnect the pulse input (RP).
Pulse input (RP) wiring is wrong.	Correct the wiring.
Motor brake engaged.	Ensure the motor brake releases properly.

Digital Operator Display	Fault Name
$rH$	rH
	Braking Resistor Overheat
	Braking resistor protection was triggered. Fault detection is enabled when L8-01 = 1 (disabled as a default).
<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 C1-08).</li> <li>Replace the braking option with a larger device that can handle the power that is discharged.</li> </ul>

Digital Operator Display	Fault Name
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>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.	

Digital Operator Display	Fault Name
rr	Dynamic Braking Transistor
	The built-in dynamic braking transistor failed.
Cause	Possible Solution
The braking transistor is damaged.	<ul style="list-style-type: none"> <li>• Cycle power to the drive and check if the fault reoccurs. <i>Refer to Diagnosing and Resetting Faults on page 298.</i></li> <li>• Replace the drive if the fault continues.</li> </ul>
The control circuit is damaged.	

Digital Operator Display	Fault Name
SC	IGBT Short Circuit
Cause	Possible Solution
IGBT fault	<ul style="list-style-type: none"> <li>• Check motor wiring</li> <li>• Cycle power to the drive.</li> <li>• If the problem continues, contact your Yaskawa representative or the nearest Yaskawa sales office.</li> </ul>
IGBT short circuit detection and circuit fault	

Digital Operator Display	Fault Name
SEr	Too Many Speed Search Restarts
	The number of speed search restarts exceeded the number set to b3-19.
Cause	Possible Solution
Speed Search parameters are set to the wrong values.	<ul style="list-style-type: none"> <li>• Reduce the detection compensation gain during Speed Search (b3-10).</li> <li>• Increase the current level when attempting Speed Search (b3-17).</li> <li>• Increase the detection time during Speed Search (b3-18).</li> <li>• Repeat Auto-Tuning.</li> </ul>
The motor is coasting in the opposite direction of the Run command.	

Digital Operator Display	Fault Name
STo	Motor Pull Out or Step Out Detection
	Motor pull out or step out has occurred. Motor has exceeded its pull out torque.
Cause	Possible Solution
The wrong motor code has been set (Yaskawa motors only).	<ul style="list-style-type: none"> <li>• Enter the correct motor code for the PM being used into E5-01.</li> <li>• For special-purpose motors, enter the correct data to all E5 parameters according to the Test Report provided for the motor.</li> </ul>
Load is too heavy.	
Load inertia is too heavy.	Increase n8-55 (Load Inertia for PM).
Acceleration and deceleration times are too short.	<ul style="list-style-type: none"> <li>• Increase the acceleration and deceleration times (C1-01 through C1-08).</li> <li>• Increase the S-curve acceleration and deceleration times (C2-01).</li> </ul>

Digital Operator Display	Fault Name
UL3	Undertorque Detection 1
	The current has fallen below the minimum value set for torque detection (L6-02) for longer than the allowable time (L6-03).
Cause	Possible Solution
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.	Check the load for any problems.

## 6.4 Fault Detection

Digital Operator Display		Fault Name
UL4	UL4	Undertorque Detection 2
		The current has fallen below the minimum value set for torque detection (L6-05) for longer than the allowable time (L6-06).
<b>Cause</b>		<b>Possible Solution</b>
Parameter settings are not appropriate for the type of load.		Check the settings of parameters L6-05 and L6-06.
There is a fault on the machine side.		Check the load for any problems.

Digital Operator Display		Fault Name
UL5	UL5	Mechanical Weakening Detection 2
		The operation conditions matched the conditions set to L6-08.
<b>Cause</b>		<b>Possible Solution</b>
Undertorque was detected and matched the condition of mechanical loss detection operation selection (L6-08).		Check the load side for any problems.

Digital Operator Display		Fault Name
Uv1	Uv1	DC Bus Undervoltage
		One of the following conditions occurred while the drive was in operation: <ul style="list-style-type: none"> <li>Voltage in the DC bus fell below the undervoltage detection level (L2-05).</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 L2-01 = 1 and the DC bus voltage is under L2-05 for longer than L2-02.</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 Torques on page 58</i> for details.</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>
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.

Digital Operator Display		Fault Name
Uv2	Uv2	Control Power Supply Voltage Fault
		Voltage is too low for the control drive input power.
<b>Cause</b>		<b>Possible Solution</b>
L2-02 changed from its default value in drive that is 7.5 kW or smaller without installing a Momentary Power Loss Ride-Thru.		Correct parameter L2-02 setting or install optional Momentary Power Loss Ride-Thru unit.
The wiring for the control power supply 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> </ul>
Internal circuitry 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> </ul>

Digital Operator Display		Fault Name
Uv3	Uv3	Undervoltage 3 (Inrush Prevention Circuit Fault)
		The inrush prevention circuit has failed.
<b>Cause</b>		<b>Possible Solution</b>

Digital Operator Display	Fault Name
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 outputs (H2-01 to H2-03), if programmed.

Investigate the cause of the alarm and [Refer to Detailed Alarm Codes, Causes, and Possible Solutions on page 282](#) for the appropriate action.

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

Table 6.10 Detailed Alarm Codes, Causes, and Possible Solutions

Digital Operator Display		Minor Fault Name	
<i>REr</i>	AEr	Station Address Setting Error (CC-Link, CANopen, MECHATROLINK)	
		Option card node address is outside the acceptable setting range.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Station number is set outside the possible setting range.		<ul style="list-style-type: none"> <li>Set parameter F6-10 to the proper value if a CC-Link option card is used</li> <li>Set parameter F6-20 to the proper value if a MECHATROLINK option card is used.</li> <li>Set parameter F6-35 to the proper value if a CANopen option card is used.</li> </ul>	YES

Digital Operator Display		Minor Fault Name	
<i>bb</i>	bb	Baseblock	
		Drive output interrupted as indicated by an external baseblock signal.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
External baseblock signal entered via multi-function input terminal (S1 to S7).		Check external sequence and baseblock signal input timing.	No output

Digital Operator Display		Minor Fault Name	
<i>bUS</i>	bUS	Option Communication Error	
		<ul style="list-style-type: none"> <li>After initial communication was established, the connection was lost.</li> <li>Assign a run command frequency reference to the option card.</li> </ul>	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Connection is broken or master controller stopped communicating.		<ul style="list-style-type: none"> <li>Check for faulty wiring.</li> <li>Correct the wiring.</li> <li>Repair ground wiring or disconnected cables.</li> </ul>	YES
Option card is damaged.		If there are no problems with the wiring and the fault continues to occur, replace the option card.	
The option card is not properly connected to the drive.		<ul style="list-style-type: none"> <li>The connector pins on the option card are not properly lined up with the connector pins on the drive.</li> <li>Reinstall the option card.</li> </ul>	
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>Take steps to counteract noise in the control circuit wiring, main circuit lines and ground wiring.</li> <li>Try to 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>All wiring for communications devices should be separated from drive input power lines. Install an EMC noise filter to the input side of the drive input power.</li> </ul>	

Digital Operator Display		Minor Fault Name	
<i>CALL</i>	CALL	Serial Communication Transmission Error	
		Communication has not yet been established.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)

Digital Operator Display		Minor Fault Name	
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>	YES
Programming error on the master side.		Check communications at start-up and correct programming errors.	
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>	
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.	

Digital Operator Display		Minor Fault Name	
$\overline{CE}$	CE	MEMOBUS/Modbus Communication Error	
		Control data was not received correctly for two seconds.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
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 an EMC noise filter to the input side of the drive input power.</li> </ul>	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>	
The CE detection time (H5-09) is set shorter than the time required for a communication cycle to take place.		<ul style="list-style-type: none"> <li>Check the PLC.</li> <li>Change the software settings in the PLC.</li> <li>Set a longer CE detection time (H5-09).</li> </ul>	
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>	
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>	

Digital Operator Display		Minor Fault Name	
$\overline{CrST}$	CrST	Can Not Reset	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
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 card during fault reset.</li> <li>Turn off the run command.</li> </ul>	YES

Digital Operator Display		Minor Fault Name	
$\overline{CyC}$	CyC	MECHATROLINK Comm. Cycle Setting Error	
		Comm. Cycle Setting Error was detected.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
The controller is using a comm. cycle beyond the allowable setting range for the MECHATROLINK option unit.		Set the comm. cycle for the upper controller within the allowable setting range for the MECHATROLINK option unit.	YES

Digital Operator Display		Minor Fault Name	
$\overline{dEv}$	dEv	Speed Deviation (for Simple V/f with PG)	
		According to the pulse input (RP), the speed deviation is greater than the setting in F1-10 for a time longer than the setting in F1-11.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)

## 6.5 Alarm Detection

Digital Operator Display	Minor Fault Name	
Load is too heavy	Reduce the load.	
Acceleration and deceleration times are set too short.	Increase the acceleration and deceleration times (C1-01 through C1-08).	
The load is locked up.	Check the machine.	
Parameter settings are inappropriate.	Check the settings of parameters F1-10 and F1-11.	
The motor brake engaged.	Ensure the brake releases properly.	
		YES

Digital Operator Display	Minor Fault Name	
$d\bar{n}\bar{E}$	dnE	Drive Disabled
<b>Cause</b>	<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
“Drive Enable” is set to a multi-function contact input (H1-□□ = 6A) and that signal was switched off.	Check the operation sequence.	YES

Digital Operator Display	Minor Fault Name	
$\bar{E}5$	E5	MECHATROLINK Watchdog Timer Error
<b>Cause</b>	<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
The watchdog timer expired while waiting for data from the controller.	Issue a DISCONNECT or ALM_CLR command, followed by a CONNECT or SYNC_SET command and move to phase 3.	YES

Digital Operator Display	Minor Fault Name	
$\bar{E}F$	EF	Forward/Reverse Run Command Input Error
		Both forward run and reverse run closed simultaneously for over 0.5 s.
<b>Cause</b>	<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
Sequence error	Check the forward and reverse command sequence and correct the problem. <b>Note:</b> Motor ramps to stop when minor fault EF is detected.	YES

Digital Operator Display	Minor Fault Name	
$\bar{E}F0$	EF0	Option Card External Fault
		An external fault condition is present.
<b>Cause</b>	<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
An external fault was received from the PLC with F6-03 = 3 (causing the drive to continue running when an external fault occurs).	<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>	YES
There is a problem with the PLC program.	Check the PLC program and correct problems.	

Digital Operator Display	Minor Fault Name	
$\bar{E}F1$	EF1	External fault (input terminal S1)
		External fault at multi-function input terminal S1.
$\bar{E}F2$	EF2	External fault (input terminal S2)
		External fault at multi-function input terminal S2.
$\bar{E}F3$	EF3	External fault (input terminal S3)
		External fault at multi-function input terminal S3.
$\bar{E}F4$	EF4	External fault (input terminal S4)
		External fault at multi-function input terminal S4.
$\bar{E}F5$	EF5	External fault (input terminal S5)
		External fault at multi-function input terminal S5.
$\bar{E}F6$	EF6	External fault (input terminal S6)
		External fault at multi-function input terminal S6.
$\bar{E}F7$	EF7	External fault (input terminal S7)
		External fault at multi-function input terminal S7.

Digital Operator Display		Minor Fault Name	
Cause	Possible Solution	Minor Fault (H2-□□ = 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>		
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>		

Digital Operator Display		Minor Fault Name	
<i>FbH</i>	FbH	Excessive PID Feedback	
		The PID feedback input is higher than the level set in b5-36 for longer than the time set in b5-37, and b5-12 is set to 1 or 4.	
Cause	Possible Solution	Minor Fault (H2-□□ = 10)	
Parameters settings for b5-36 and b5-37 are incorrect.	Check parameters b5-36 and b5-37.	YES	
PID feedback wiring is faulty.	Correct the wiring.		
Feedback sensor has malfunctioned.	Check the sensor and replace it if damaged.		
Feedback input circuit is damaged.	Replace the drive.		

Digital Operator Display		Minor Fault Name	
<i>FbL</i>	FbL	PID Feedback Loss	
		The PID feedback input is lower than the level set in b5-13 for longer than the time set in b5-14, and b5-12 is set to 1 or 4.	
Cause	Possible Solution	Minor Fault (H2-□□ = 10)	
Parameters settings for b5-13 and b5-14 are incorrect.	Check parameters b5-13 and b5-14.	YES	
PID feedback wiring is faulty.	Correct the wiring.		
Feedback sensor has malfunctioned.	Check the sensor and replace it if damaged.		
Feedback input circuit is damaged.	Replace the drive.		

Digital Operator Display		Minor Fault Name	
<i>Hbb</i>	Hbb	Safe Disable Signal Input	
		The Safe Disable Input channel is open.	
Cause	Possible Solution	Minor Fault (H2-□□ = 10)	
There is no signal at terminal H1.	Check if external safety circuit tripped and disabled the drive. If the Safe Disable function is not utilized, check if the terminals HC, H1, and H2 are linked.	YES	
Internally, the Safe Disable channel is broken.	Replace the drive.		

Digital Operator Display		Minor Fault Name	
<i>HbbF</i>	HbbF	Safe Disable Signal Input	
		The safe disable input hardware is defective.	
Cause	Possible Solution	Minor Fault (H2-□□ = 10)	
One of the Safe Disable channels is faulty.	Replace the drive.	YES	

Digital Operator Display		Minor Fault Name	
<i>HcA</i>	HcA	Current Alarm	
		Drive current exceeded overcurrent warning level (150% of the rated current).	
Cause	Possible Solution	Minor Fault (H2-□□ = 10)	

## 6.5 Alarm Detection

Digital Operator Display		Minor Fault Name	
Load is too heavy.		<ul style="list-style-type: none"> <li>• Measure the current flowing through the motor.</li> <li>• Reduce the load or increase the capacity of the drive.</li> </ul>	YES
Acceleration and deceleration times are too short.			
A special-purpose motor is being used, or the drive is attempting to run a motor greater than the maximum allowable capacity.			

Digital Operator Display		Minor Fault Name	
LF-1	LT-1	Cooling Fan Maintenance Time	
		The cooling fan has reached its expected maintenance period and may need to be replaced. <b>Note:</b> An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.	
<b>Cause</b>		<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
The cooling fan has reached 90% of its expected performance life.		Replace the cooling fan and reset the Maintenance Monitor by setting o4-03 to 0.	–

Digital Operator Display		Minor Fault Name	
LF-2	LT-2	Capacitor Maintenance Time	
		The main circuit and control circuit capacitors are nearing the end of their expected performance life. <b>Note:</b> An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.	
<b>Cause</b>		<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
The main circuit and control circuit capacitors have reached 90% of their expected performance life.		Replace either the control board or the entire drive. For instructions on replacing the control board, contact Yaskawa or your nearest sales representative.	–

Digital Operator Display		Minor Fault Name	
LF-3	LT-3	Soft Charge Bypass Relay Maintenance Time	
		The DC bus soft charge relay is nearing the end of its expected performance life. <b>Note:</b> An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.	
<b>Cause</b>		<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
The DC bus soft charge relay has reached 90% of their expected performance life.		Replace either the control board or the entire drive. For instructions on replacing the control board, contact Yaskawa or your nearest sales representative.	–

Digital Operator Display		Minor Fault Name	
LF-4	LT-4	IGBT Maintenance Time (50%)	
		IGBTs have reached 50% of their expected performance life. <b>Note:</b> An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.	
<b>Cause</b>		<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>
IGBTs have reached 50% of their expected performance life.		Check the load, carrier frequency, and output frequency.	–

Digital Operator Display		Minor Fault Name	
oH	oH	Heatsink Overheat	
		The temperature exceeded the value set to L8-02.	
<b>Cause</b>		<b>Possible Solution</b>	<b>Minor Fault (H2-□□ = 10)</b>

Digital Operator Display		Minor Fault Name	
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>	
Internal cooling fan has stopped.		<ul style="list-style-type: none"> <li>Replace the cooling fan. <i>Refer to Cooling Fan Replacement on page 317.</i></li> <li>After replacing the fan, reset the cooling fan maintenance parameter to (o4-03 = "0").</li> </ul>	
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 38.</i></li> <li>Allow for the specified space and ensure that there is sufficient circulation around the control panel.</li> </ul>	
		<ul style="list-style-type: none"> <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

Digital Operator Display		Minor Fault Name	
oH2	oH2	Drive Overheat Warning	
		"Drive Overheat Warning" was input to a multi-function input terminal, S1 through S7 (H1-□□ = B)	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
An external device triggered and overheat warning in the drive.		<ul style="list-style-type: none"> <li>Search for the device that tripped the overheat warning.</li> <li>Solving the problem will clear the warning.</li> </ul>	YES

Digital Operator Display		Minor Fault Name	
oH3	oH3	Motor Overheat	
		The motor overheat signal entered to a multi-function analog input terminal exceeded the alarm level (H3-02 or H3-10 = E).	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
Motor thermostat wiring is fault (PTC input).		Repair the PTC input wiring.	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>	
Motor has overheated.		<ul style="list-style-type: none"> <li>Check the load size, accel/decel times, and cycle times.</li> <li>Decrease the load.</li> <li>Increase accel and decel times (C1-01 to C1-08).</li> <li>Adjust the preset V/f pattern (E1-04 through E1-10). This will mainly involve reducing E1-08 and E1-10. <b>Note:</b> Do not lower E1-08 and E1-10 excessively, because this reduces load tolerance at low speeds.</li> <li>Check the motor-rated current.</li> <li>Enter motor-rated current on motor nameplate (E2-01).</li> <li>Ensure the motor cooling system is operating normally.</li> <li>Repair or replace the motor cooling system.</li> </ul>	

Digital Operator Display		Minor Fault Name	
oL3	oL3	Overtorque 1	
		Drive output current (or torque in OLV) was greater than L6-02 for longer than the time set in L6-03.	
Cause		Possible Solution	Minor Fault (H2-□□ = 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>	

Digital Operator Display		Minor Fault Name	
oL4	oL4	Overtorque 2	
		Drive output current (or torque in OLV) was greater than L6-05 for longer than the time set in L6-06.	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)

## 6.5 Alarm Detection

Digital Operator Display		Minor Fault Name	
Parameter settings are not appropriate.		Check parameters L6-05 and L6-06.	
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 being used.</li> <li>Remove the cause of the fault.</li> </ul>	YES

Digital Operator Display		Minor Fault Name	
<i>oL5</i>	oL5	Mechanical Weakening Detection 1	
		Overtorque occurred, matching the conditions specified in L6-08.	
<b>Cause</b>		<b>Possible Solution</b>	
Overtorque occurred, triggering the mechanical weakening level set to L6-08.		Check for the cause of mechanical weakening.	Minor Fault (H2-□□ = 10) YES

Digital Operator Display		Minor Fault Name	
<i>oS</i>	oS	Overspeed (for Simple V/f with PG)	
		Pulse input (RP) indicates that motor speed feedback exceeded F1-08 setting.	
<b>Cause</b>		<b>Possible Solution</b>	
Overshoot or undershoot is occurring.		<ul style="list-style-type: none"> <li>Adjust the gain by using the pulse train input parameters (H6-02 through H6-05).</li> <li>Adjust the speed feedback accuracy.</li> <li>Increase the settings for C5-01 (Speed Control Proportional Gain 1) and reduce C5-02 (Speed Control Integral Time 1).</li> </ul>	Minor Fault (H2-□□ = 10) YES
PG pulse settings are incorrect.		Set the H6-02 (Pulse Train Input Scaling) to the frequency of PG pulses at maximum motor speed.	
Parameter settings are inappropriate.		Check the setting for the overspeed detection level and the overspeed detection time (F1-08 and F1-09).	

Digital Operator Display		Minor Fault Name	
<i>ov</i>	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)	
<b>Cause</b>		<b>Possible Solution</b>	
Surge voltage present in the drive input power.		<ul style="list-style-type: none"> <li>Install an AC reactor or DC link choke.</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>	Minor Fault (H2-□□ = 10) 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>	
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>	
		Set number of fault restarts (L5-01) to a value other than 0.	

Digital Operator Display		Minor Fault Name	
<i>PASS</i>	PASS	MEMOBUS/Modbus Comm. Test Mode Complete	
<b>Cause</b>		<b>Possible Solution</b>	
MEMOBUS/Modbus test has finished normally.		This verifies that the test was successful.	Minor Fault (H2-□□ = 10) No output

Digital Operator Display		Minor Fault Name	
<i>PGO</i>	PGO	PG Disconnect (for Simple V/f with PG)	
		Detected when no PG pulses received for a time longer than setting in F1-14.	
<b>Cause</b>		<b>Possible Solution</b>	
			Minor Fault (H2-□□ = 10)

Digital Operator Display		Minor Fault Name	
Pulse input (RP) is disconnected.		Reconnect the pulse input (RP).	
Pulse input (RP) wiring is wrong.		Correct the wiring.	
Motor brake is engaged.		Ensure the brake releases properly	
YES			

Digital Operator Display		Minor Fault Name	
<i>rUn</i>	rUn	Motor Switch during Run	
		A command to switch motors was entered during run.	
<b>Cause</b>		<b>Possible Solution</b>	
A motor switch command was entered during run.		Change the operation pattern so that the motor switch command is entered while the drive is stopped.	
<b>Minor Fault (H2-□□ = 10)</b> YES			

Digital Operator Display		Minor Fault Name	
<i>SE</i>	SE	MEMOBUS/Modbus Communication Test Mode Error	
<b>Cause</b>		<b>Possible Solution</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.	
<b>Minor Fault (H2-□□ = 10)</b> No output			

Digital Operator Display		Minor Fault Name	
<i>TrPC</i>	TrPC	IGBT Maintenance Time (90%)	
		IGBTs have reached 90% of their expected performance life.	
<b>Cause</b>		<b>Possible Solution</b>	
IGBTs have reached 90% of their expected performance life.		Replace the drive.	
<b>Minor Fault (H2-□□ = 10)</b> YES			

Digital Operator Display		Minor Fault Name	
<i>UL3</i>	UL3	Undertorque Detection 1	
		Drive output current (or torque in OLV) less than L6-02 for longer than L6-03 time.	
<b>Cause</b>		<b>Possible Solution</b>	
Inappropriate parameter settings.		Check parameters L6-02 and L6-03.	
Load has dropped or decreased significantly.		Check for broken parts in the transmission system.	
<b>Minor Fault (H2-□□ = 10)</b> YES			

Digital Operator Display		Minor Fault Name	
<i>UL4</i>	UL4	Undertorque Detection 2	
		Drive output current (or torque in OLV) less than L6-05 for longer than L6-06 time.	
<b>Cause</b>		<b>Possible Solution</b>	
Inappropriate parameter settings.		Check parameters L6-05 and L6-06.	
The load has dropped or decreased significantly.		Check for broken parts in the transmission system.	
<b>Minor Fault (H2-□□ = 10)</b> YES			

Digital Operator Display		Minor Fault Name	
<i>UL5</i>	UL5	Mechanical Weakening Detection 2	
		The operation conditions matched the conditions set to L6-08.	
<b>Cause</b>		<b>Possible Solution</b>	
Undertorque was detected and matched the condition of mechanical loss detection operation selection (L6-08).		Check the load side for any problems.	
<b>Minor Fault (H2-□□ = 10)</b> YES			

## 6.5 Alarm Detection

Digital Operator Display		Minor Fault Name	
Uu	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 level specified in L2-05.</li> <li>• Contactor 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 under L2-05.</li> </ul>	
Cause		Possible Solution	Minor Fault (H2-□□ = 10)
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 <a href="#">Wire Gauges and Tightening Torques on page 58</a>.</i></li> </ul>	
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>	
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>	
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>	
Air inside the drive is too hot.		<ul style="list-style-type: none"> <li>• Check the temperature inside the drive.</li> </ul>	
The CHARGE indicator light is broken or disconnected.		<ul style="list-style-type: none"> <li>• Replace the drive.</li> </ul>	