

YASKAWA AC Drive E1000

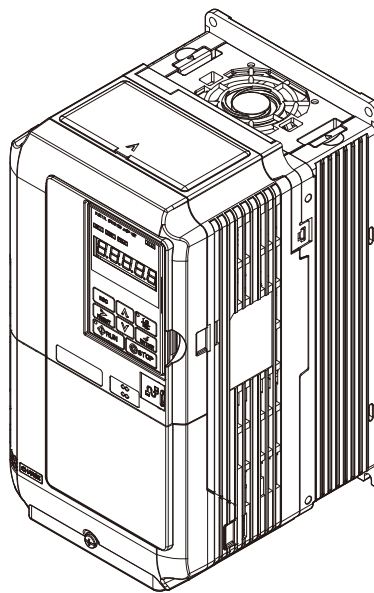
AC Drive for Fan and Pump

Technical Manual

Type: CIMR-EB□A □□□□

Models: 200 V Class: 0.75 to 110 kW
400 V Class: 0.75 to 355 kW

To properly use the product, read this manual thoroughly and retain for easy reference, inspection, and maintenance. Ensure the end user receives this manual.



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◆ Alarm and Error Displays

■ Faults

Table 6.5 gives an overview of possible fault codes. As conditions such as overvoltage can trip both a fault and an alarm, it is important to distinguish between faults and alarms in order to find the right corrective action.

When the drive detects a fault, the ALM indicator LEDs lights and the fault code appears on the display. The drive fault contact MA-MB-MC will be triggered. If the ALM LED blinks and the code appearing on the operator screen is flashes, then an alarm has been detected. See *Minor Faults and Alarms on page 250* for a list of alarm codes.

Table 6.5 Fault Displays

Digital Operator Display		Name	Page	Digital Operator Display		Name	Page
bUS	bUS	Option Communication Error	252	oFA01	oFA01	Option Card Fault (CN5-A)	256
CE	CE	MEMOBUS/Modbus Communication Error	252	oFA03 to oFA06	oFA03 to oFA06	Option Card Error (CN5-A)	256
CPF00, CPF01 <1>	CPF00, CPF01	Control Circuit Error	252	oFA10, oFA11	oFA10, oFA11	Option Card Error (CN5-A)	256
CPF02	CPF02	A/D Conversion Error	252	oFA12 to oFA17	oFA12 to oFA17	Option Card Connection Error (CN5-A)	256
CPF03	CPF03	Control Board Connection Error	252	oFA30 to oFA43	oFA30 to oFA43	Option Card Connection Error (CN5-A)	256
CPF06	CPF06	EEPROM Memory Data Error	252	oFb00	oFb00	Option Card Connection Error (CN5-B)	257
CPF07, CPF08	CPF07, CPF08	Terminal Board Connection Error	253	oFC00	oFC00	Option Card Connection Error (CN5-C)	257
CPF20, CPF21 <1>	CPF20, CPF21	Control Circuit Error	253	oH	oH	Heatsink Overheat	257
CPF22	CPF22	Hybrid IC Error	253	oH1	oH1	Heatsink Overheat	257
CPF23	CPF23	Control Board Connection Error	253	oH3	oH3	Motor Overheat 1 (PTC input)	257
CPF24	CPF24	Drive Unit Signal Fault	253	oH4	oH4	Motor Overheat 2 (PTC input)	257
CPF26 to CPF34	CPF26 to CPF34	Control Circuit Error	253	oL1	oL1	Motor Overload	258
dWFL	dWFL	DriveWorksEZ Fault	253	oL2	oL2	Drive Overload	258
E5	E5	SI-T3 Watchdog Timer Error	253	oL3	oL3	Overtorque Detection 1	258
EF0	EF0	Option Card External Fault	253	oL7	oL7	High Slip Braking oL	258
EF1 to EF8	EF1 to EF8	External Fault (input terminal S1 to S8)	254	oPr	oPr	Operator Connection Fault	258
Err	Err	EEPROM Write Error	254	ov	ov	Overvoltage	259
FAn	FAn	Internal Fan Fault	254	PF	PF	Input Phase Loss	259
FbH	FbH	Excessive PI Feedback	254	SEr	SEr	Too Many Speed Search Restarts	259
FbL	FbL	PI Feedback Loss	254	STo	STo	Pull-Out Detection	259
GF	GF	Ground Fault	255	UL3	UL3	Undertorque Detection 1	260
LF	LF	Output Phase Loss	255	UL6	UL6	Motor Underload	260
LF2	LF2	Current Imbalance	255	Uv1	Uv1	Undervoltage	260
nSE	nSE	Node Setup Error	255	Uv2	Uv2	Control Power Supply Undervoltage	260
oC	oC	Overcurrent	256	Uv3	Uv3	Soft Charge Circuit Fault	260
oFA00	oFA00	Option Card Connection Error (CN5-A)	256	voF	voF	Output Voltage Detection Fault	260

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

6.3 Drive Alarms, Faults, and Errors

■ Minor Faults and Alarms

Table 6.6 give an overview of possible alarm codes. As conditions such as overvoltage can trip both a fault and alarm, it is important to distinguish between faults and alarms in order to find the right corrective action.

If an alarm is detected, the ALM LED will blink and the alarm code display flashes. The majority of alarms will trigger a digital output programmed for alarm output (H2-□□ = 10). If the ALM LED lights without blinking, this means that a fault has been detected (not an alarm). Information on fault codes can be found in [Faults on page 249](#).

Table 6.6 Minor Fault and Alarm Displays

Digital Operator Display	Name	Minor Fault Output (H2-□□ = 10)	Page
<i>AEr</i>	AEr	Station Number Setting Error (CC-Link, CANopen, MECHATROLINK-II)	261
<i>bb</i>	bb	Drive Baseblock	261
<i>bUS</i>	bUS	Option Card Communications Error	261
<i>CALL</i>	CALL	Serial Communication Transmission Error	261
<i>CE</i>	CE	MEMOBUS/Modbus Communication Error	261
<i>CrST</i>	CrST	Cannot Reset	262
<i>dnE</i>	dnE	Drive Disabled	262
<i>dWAL</i>	dWAL	DriveWorksEZ Alarm	253
<i>E5</i>	E5	SI-T3 Watchdog Timer Error	253
<i>EF</i>	EF	Run Command Input Error	262
<i>EF0</i>	EF0	Option Card External Fault	262
<i>EF1 to EF8</i>	EF1 to EF8	External Fault (input terminal S1 to S8)	262
<i>FbH</i>	FbH	Excessive PI Feedback	262
<i>FbL</i>	FbL	PI Feedback Loss	262
<i>Hbb</i>	Hbb	Hardwire Baseblock Signal Input	263
<i>HbbF</i>	HbbF	Hardwire Baseblock Signal Input	263
<i>HCA</i>	HCA	Current Alarm	263
<i>LT-1</i>	LT-1	Cooling Fan Maintenance Time	263
<i>LT-2</i>	LT-2	Capacitor Maintenance Time	263
<i>LT-3</i>	LT-3	Soft Charge Bypass Relay Maintenance Time	263
<i>LT-4</i>	LT-4	IGBT Maintenance Time (50%)	263
<i>oH</i>	oH	Heatsink Overheat	263
<i>oH2</i>	oH2	Drive Overheat	264
<i>oH3</i>	oH3	Motor Overheat	264
<i>oL3</i>	oL3	Overtorque 1	264
<i>ov</i>	ov	Overvoltage	264
<i>PASS</i>	PASS	MEMOBUS/Modbus Test Mode Complete	264
<i>SE</i>	SE	MEMOBUS/Modbus Test Mode Fault	264
<i>TrPC</i>	TrPC	IGBT Maintenance Time (90%)	264
<i>UL3</i>	UL3	Undertorque 1	265
<i>UL6</i>	UL6	Motor Underload	260
<i>Uv</i>	Uv	Undervoltage	265
<i>voF</i>	voF	Output Voltage Detection Fault	265
<i>WrUn</i>	WrUn	Waiting to Run	265

<1> Output when H2-□□ = 2F.

■ Operation Errors

Table 6.7 Operation Error Displays

Digital Operator Display	Name	Page	Digital Operator Display	Name	Page
<i>oPE01</i>	oPE01	Drive Unit Setting Error	<i>oPE08</i>	oPE08	Parameter Selection Error
<i>oPE02</i>	oPE02	Parameter Setting Range Error	<i>oPE09</i>	oPE09	PI Control Selection Error
<i>oPE03</i>	oPE03	Multi-Function Input Setting Error	<i>oPE10</i>	oPE10	V/f Data Setting Error
<i>oPE04</i>	oPE04	Terminal Board Mismatch Error	<i>oPE11</i>	oPE11	Carrier Frequency Setting Error
<i>oPE05</i>	oPE05	Run Command Selection Error	<i>oPE13</i>	oPE13	Pulse Train Monitor Selection Error
<i>oPE07</i>	oPE07	Multi-Function Analog Input Selection Error	<i>oPE16</i>	oPE16	Energy Saving Constants Error

■ Auto-Tuning Errors

Table 6.8 Auto-Tuning Error Displays

Digital Operator Display	Name	Page	Digital Operator Display	Name	Page
<i>End1</i>	End1	Excessive V/f Setting	<i>Er-03</i>	Er-03	STOP button Input
<i>End3</i>	End3	Rated Current Setting Alarm	<i>Er-04</i>	Er-04	Line-to-Line Resistance Error
<i>End4</i>	End4	Adjusted Slip Value Fell Below Lower Limit	<i>Er-05</i>	Er-05	No-Load Current Error
<i>End5</i>	End5	Resistance Between Lines Error	<i>Er-08</i>	Er-08	Rated Slip Error
<i>End7</i>	End7	No-Load Current Alarm	<i>Er-09</i>	Er-09	Acceleration Error
<i>Er-01</i>	Er-01	Motor Data Error	<i>Er-11</i>	Er-11	Motor Speed Error
<i>Er-02</i>	Er-02	Alarm	<i>Er-12</i>	Er-12	Current Detection Error

■ Errors and Displays When Using the Copy Function

Table 6.9 Copy Errors

Digital Operator Display	Name	Page
<i>CoPy</i>	CoPy	Writing parameter settings (flashing)
<i>CPeR</i>	CPEr	Control mode of the drive does not match
<i>CPyE</i>	CPyE	Error writing data
<i>CSEr</i>	CSEr	Error occurred in the copy function
<i>dFPS</i>	dFPS	Drive models do not match.
<i>End</i>	End	Task completed
<i>iFEr</i>	iFEr	Communication error
<i>ndAT</i>	ndAT	Model, voltage class, capacity, and/or control mode differ
<i>rdEr</i>	rdEr	Error reading data
<i>rEAd</i>	rEAd	Reading parameter settings (flashing)
<i>vAEr</i>	vAEr	Voltage class and/or drive capacity does not match
<i>vFyE</i>	vFyE	Parameter settings in the drive and those saved to the copy function are not the same
<i>vrFy</i>	vrFy	Comparing parameter settings (flashing)

6.4 Fault Detection

◆ Fault Displays, Causes, and Possible Solutions


Faults are detected for drive protection, and cause the drive to stop. When a fault occurs, the fault output terminal MA-MB-MC is triggered. Faults have to be cleared manually after removing the cause to start running the drive again.

Table 6.10 Detailed Fault Displays, Causes, and Possible Solutions

Digital Operator Display		Fault Name
<i>bUS</i>	bUS	Option Communication Error • After establishing initial communication, the connection was lost. • Only detected when the run command frequency reference is assigned to an option card.
Cause		Possible Solution
No signal received from the PLC.		• Check for faulty wiring. • Correct the wiring.
Faulty communications wiring or a short circuit exists.		• Check for disconnected cables and short circuits. Repair as needed.
A communications data error occurred due to noise.		• Check the various options available to minimize the effects of noise. • Take steps to counteract noise in the control circuit, main circuit, and ground wiring. • Ensure that other equipment such as switches or relays do not cause noise. Use surge suppressors if necessary. • Use only recommended cables or other shielded line. Ground the shield on the controller side or on the drive input power side. • Separate all communication wiring from drive power lines. Install an EMC noise filter to the drive power supply input.
The option card is damaged.		• Replace the option card if there are no problems with the wiring and the error continues to occur.
The option card is not properly connected to the drive.		• The connector pins on the option card are not properly lined up with the connector pins on the drive. • Reinstall the option card.
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.
Cause		Possible Solution
Faulty communications wiring or a short circuit exists.		• Check for faulty wiring. • Correct the wiring. • Check for disconnected cables and short circuits. Repair as needed.
Communication data error occurred due to noise.		• Check the various options available to minimize the effects of noise. • Take steps to counteract noise in the control circuit, main circuit, and ground wiring. • Use only recommended cables or other shielded line. Ground the shield on the controller side or on the drive input power side. • Ensure that other equipment such as switches or relays do not cause noise and use surge suppressors if required. • Separate all communication wiring from drive power lines. Install an EMC noise filter to the drive power supply input.
Digital Operator Display		Fault Name
<i>CPF00 or CPF01</i> </>	CPF00 or CPF01 </>	Control Circuit Error
Cause		Possible Solution
There is a self diagnostic error in control circuit.		• Cycle power to the drive. • If the problem continues, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Connector on the operator is damaged.		• Replace the operator.
Digital Operator Display		Fault Name
<i>CPF02</i>	CPF02	A/D Conversion Error An A/D conversion error or control circuit error occurred.
Cause		Possible Solution
Control circuit is damaged.		• Cycle power to the drive. • If the problem continues, 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		Fault Name
<i>CPF03</i>	CPF03	Control Board Connection Error Connection error between the control board and the drive
Cause		Possible Solution
There is a connection error.		• Turn the power off and check the connection between the control board and the drive. • If the problem continues, replace either the control board or the entire drive.
Drive fails to operate properly due to noise interference.		• Check the various options available to minimize the effects of noise. • Take steps to counteract noise in the control circuit, main circuit, and ground wiring. • Use only recommended cables or other shielded line. Ground the shield on the controller side or on the drive input power side. • Ensure that other equipment such as switches or relays do not cause noise and use surge suppressors if required. • Separate all communication wiring from drive power lines. Install an EMC noise filter to the drive power supply input.
Digital Operator Display		Fault Name
<i>CPF06</i>	CPF06	EEPROM Memory Data Error There is an error in the data saved to EEPROM.
Cause		Possible Solution
There is an error in EEPROM control circuit.		• Turn the power off and check the connection between the control board and the drive. • If the problem continues, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
The power supply was switched off when parameters were being saved to the drive.		Reinitialize the drive (A1-03).

Digital Operator Display		Fault Name
[PF07]	CPF07	Terminal Board Connection Error
[PF08]	CPF08	
Cause		Possible Solution
There is a fault connection between the terminal board and control board.		<ul style="list-style-type: none"> Turn the power off and reconnect the control circuit terminal board. If the problem continues, 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		Fault Name
[PF20] or [PF21 </>]	CPF20 or CPF21 </>	Control Circuit Error
Cause		Possible Solution
Hardware is damaged.		<ul style="list-style-type: none"> Cycle power to the drive. If the problem continues, 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		Fault Name
[PF22]	CPF22	Hybrid IC Error
Cause		Possible Solution
Hybrid IC on the main circuit is damaged.		<ul style="list-style-type: none"> Cycle power to the drive. <i>Refer to Diagnosing and Resetting Faults on page 273.</i> If the problem continues, 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		Fault Name
[PF23]	CPF23	Control Board Connection Error
Cause		Possible Solution
Hardware is damaged.		<ul style="list-style-type: none"> Turn the power off and check the connection between the control board and the drive. If the problem continues, 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		Fault Name
[PF24]	CPF24	Drive Unit Signal Fault
Cause		Possible Solution
Hardware is damaged.		<ul style="list-style-type: none"> The drive capacity cannot be detected correctly (drive capacity is checked when the drive is powered up). 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		Fault Name
[PF26] to [PF34]	CPF26 to CPF34	Control Circuit Error
Cause		Possible Solution
Hardware is damaged.		<ul style="list-style-type: none"> CPU error 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		Fault Name
dWAL	dWAL	DriveWorksEZ Fault
dWFL	dWFL	
Cause		Possible Solution
Fault output by DriveWorksEZ		<ul style="list-style-type: none"> Correct whatever caused the fault.
Digital Operator Display		Fault Name
E5	E5	SI-T3 Watchdog Timer Error
Cause		Possible Solution
Data has not been received from the PLC, triggering the watchdog timer.		<ul style="list-style-type: none"> ⇒ Execute DISCONNECT or ALM_CLR, then issue a CONNECT command or SYNC_SET command and proceed to phase 3.
Digital Operator Display		Fault Name
EF0	EF0	Option Card External Fault
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"> Remove the cause of the external fault. Remove the external fault input from the PLC.
Problem with the PLC program.		Check the PLC program and correct problems.

6.4 Fault Detection

Digital 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.
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.
EF8	EF8	External Fault (input terminal S8)
		External fault at multi-function input terminal S8.
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"> Ensure the signal lines have been connected properly to the terminals assigned for external fault detection (H1-□□ = 20 to 2F). Reconnect the signal line.
Incorrect setting of multi-function contact inputs.		<ul style="list-style-type: none"> Check if the any unused terminals are set for H1-□□ = 20 to 2F (External Fault). Change the terminal settings.
Digital Operator Display		Fault Name
Err	Err	EEPROM Write Error
		Data cannot be written to the EEPROM.
Cause		Possible Solution
Noise has corrupted data while writing to the EEPROM.		<ul style="list-style-type: none"> Press the  button. Correct the parameter setting. Cycle power to the drive. <i>Refer to Diagnosing and Resetting Faults on page 273.</i> Replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Hardware problem.		<ul style="list-style-type: none"> 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		Fault Name
FAn	FAn	Internal Fan Fault
		Fan or magnetic contactor failed.
Cause		Possible Solution
Internal cooling fan has malfunctioned (models 2A0360, 2A0415, 4A0362 to 4A0675).		Cycle power to the drive and see if the fault is still present. Check if the fan is operating or not. Verify the cumulative operation time of the fan using monitor U4-03, and the fan maintenance timer in U4-04. If the cooling fan has passed its expected performance life or is damaged in some way, follow the instructions in this manual to replace it.
Fault detected in the internal cooling fan or magnetic contactor to the power supply (models 2A0250 to 2A0415, 4A0165 to 4A0675).		Cycle power to the drive and see if the fault is still present. If the fault still occurs, either replace the control circuit board or the entire unit. For instructions on replacing the power board, contact the YASKAWA sales office directly or your nearest YASKAWA representative.
Digital Operator Display		Fault Name
FbH	FbH	Excessive PI Feedback
		PI feedback input is greater than the level set b5-36 for longer than the time set to b5-37. To enable fault detection, set b5-12 = 2 or 5.
Cause		Possible Solution
Parameters are not set appropriately.		Check the settings of parameters b5-36 and b5-37.
Wiring for PI feedback is incorrect.		Correct the wiring.
There is a problem with the feedback sensor.		<ul style="list-style-type: none"> Check the sensor on the control side. Replace the sensor if damaged.
Digital Operator Display		Fault Name
FbL	FbL	PI Feedback Loss
		This fault occurs when PI feedback loss detection is programmed to trigger a fault (b5-12 = 2) and the PI feedback level is below the detection level set to b5-13 for longer than the time set to b5-14.
Cause		Possible Solution
Parameters are not set appropriately.		Check the settings of parameters b5-13 and b5-14.
Wiring for PI 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"> A current short to ground exceeded 50% of rated current on the output side of the drive. Setting L8-09 to 1 enables ground fault detection in models 2A0030 through 2A0415 and 4A0018 through 4A0675.
Cause		Possible Solution
Motor insulation is damaged.		<ul style="list-style-type: none"> Check the insulation resistance of the motor. Replace the motor.
A damaged motor cable is creating a short circuit.		<ul style="list-style-type: none"> Check the motor cable. Remove the short circuit and turn the power back on.
The leakage current at the drive output is too high.		<ul style="list-style-type: none"> Check the resistance between the cable and the ground terminal ⊕. Replace the cable.
The drive started to run during a current offset fault or while coasting to a stop.		<ul style="list-style-type: none"> Reduce the carrier frequency. Reduce the amount of stray capacitance.
Hardware problem.		<ul style="list-style-type: none"> The value set exceeds the allowable setting range while the drive automatically adjusts the current offset (this happens only when attempting to restart a PM motor that is coasting to stop). Enable Speed Search at start (b3-01 = 1). Perform Speed Search 1 or 2 (H1-□□ = 61 or 62) via one of the external terminals. <p>Note: Speed Search 1 and 2 are the same when using PM OLV.</p>
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		Fault Name
LF	LF	Output Phase Loss
		<ul style="list-style-type: none"> Phase loss on the output side of the drive. Phase Loss Detection is enabled when L8-07 is set to 1 or 2.
Cause		Possible Solution
The output cable is disconnected.		<ul style="list-style-type: none"> Check for wiring errors and ensure the output cable is connected properly. Correct the wiring.
The motor winding is damaged.		<ul style="list-style-type: none"> Check the resistance between motor lines. Replace the motor if the winding is damaged.
The output terminal is loose.		<ul style="list-style-type: none"> Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Size and Torque Specifications on page 75.</i>
The rated current of 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 either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
A single-phase motor is being used.		The drive cannot operate a single phase motor.
Digital Operator Display		Fault Name
LF2	LF2	Output current imbalance (detected when L8-29 = 1)
		One or more of the phases in the output current is lost.
Cause		Possible Solution
Phase loss has occurred on the output side of the drive.		<ul style="list-style-type: none"> Check for faulty wiring or poor connections on the output side of the drive. Correct the wiring.
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 75.</i>
The output circuit is damaged.		Replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Motor impedance or motor phases are uneven.		<ul style="list-style-type: none"> Measure the line-to-line resistance for each motor phase. Ensure all values are the same. Replace the motor.
Digital Operator Display		Fault Name
nSE	nSE	Node Setup Error
		A terminal assigned to the node setup function closed during run.
Cause		Possible Solution
The node setup terminal closed during run.		Stop the drive when using the node setup function.
A run command was issued while the node setup function was active.		

6.4 Fault Detection

Digital Operator Display		Fault Name
	oC	Overcurrent
Cause		Drive sensors have detected an output current greater than the specified overcurrent level.
Possible Solution		<ul style="list-style-type: none"> Check the insulation resistance. Replace the motor.
The motor has been damaged due to overheating or the motor insulation is damaged.		<ul style="list-style-type: none"> Check the motor cables. Remove the short circuit and power the drive back up.
One of the motor cables has shorted out or there is a grounding problem.		<ul style="list-style-type: none"> Check the resistance between the motor cables and the ground terminal ⊕. Replace damaged cables.
The load is too heavy.		<ul style="list-style-type: none"> Measure the current flowing into the motor. Replace the drive with a larger capacity unit if the current value exceeds the rated current of the drive. Determine if there is sudden fluctuation in the current level. Reduce the load to avoid sudden changes in the current level or switch to a larger drive.
The acceleration or deceleration times are too short.		Calculate the torque needed during acceleration relative to the load inertia and the specified acceleration time. If the right amount of torque cannot be set, make the following changes: <ul style="list-style-type: none"> Increase the acceleration time (C1-01, -03, -05, -07) Increase the S-curve characteristics (C2-01 and C2-02) Increase the capacity of the drive.
The drive is attempting to operate a specialized motor or a motor larger than the maximum size allowed.		<ul style="list-style-type: none"> Check the motor capacity. Ensure that the rated capacity of the drive is greater than or equal to the capacity rating found on the motor nameplate.
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"> Check the ratios between the voltage and frequency. Set parameter E1-04 through E1-10 appropriately. Lower the voltage if it is too high relative to the frequency.
Excessive torque compensation.		<ul style="list-style-type: none"> Check the amount of torque compensation. Reduce the torque compensation gain (C4-01) until there is no speed loss and less current.
Drive fails to operate properly due to noise interference.		<ul style="list-style-type: none"> Review the possible solutions provided for handling noise interference. Review the section on handling noise interference and check the control circuit lines, main circuit lines, and ground wiring.
Overexcitation gain is set too high.		<ul style="list-style-type: none"> Check if fault occurs simultaneously to overexcitation function operation. Consider motor flux saturation and reduce the value of n3-13 (Overexcitation Deceleration Gain).
Run command applied while motor was coasting.		<ul style="list-style-type: none"> Enable Speed Search at start (b3-01 = 1). Program the Speed Search command input through one of the multi-function contact input terminals (H1-□□ = 61 or 62).
The wrong motor code has been entered for PM Open Loop Vector (YASKAWA motors only) or the motor data are wrong.		<ul style="list-style-type: none"> Enter the correct motor code to E5-01. If a non-YASKAWA PM motor is used, enter "FFFF" to E5-01. Set the correct motor data to the E5-□□ parameters or perform Auto-Tuning.
The motor control method and motor do not match.		<ul style="list-style-type: none"> Check which motor control method the drive is set to (A1-02). For IM motors, set A1-02 = "0". For PM motors, set A1-02 = "5".
The drives rated output current is too small.		Use a larger drive.
Digital Operator Display		Fault Name
	oFA00	Option Card Connection Error at Option Port CN5-A
Cause		Option compatibility error
Possible Solution		Check if the drive supports the option card that you are attempting to install. The port CN5-A supports communication option cards only. More than one comm. option cannot be installed. The following option cards are not available for this drive: PG-X3, PG-B3, DI-A3, AI-A3, DO-A3, AO-A3
Digital Operator Display		Fault Name
	oFA01	Option Card Fault at Option Port CN5-A
Cause		Option not properly connected
Possible Solution		<ul style="list-style-type: none"> Turn the power off and reconnect the option card. Check if the option card is properly plugged into the option port. Make sure the card is fixed properly. If the option is not a communication option card, try to use the card in another option port. If it works there, replace the drive. If the error persists (oFb01 or oFC01 occur), replace the option board.
Digital Operator Display		Fault Name
	oFA03 to oFA06	Option card error occurred at option port CN5-A
	oFA10, oFA11	
	oFA12 to oFA17	
	oFA30 to oFA43	
Cause		Possible Solution
Option card or hardware is damaged.		<ul style="list-style-type: none"> Cycle power to the drive. If the problem continues, 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		Fault Name
oFb00	oFb00	Option Card Fault at Option Port CN5-B
		Option compatibility error
Cause		Possible Solution
The option card installed into port CN5-B is incompatible with the drive.		Check if the drive supports the option card that you are attempting to install. The following option cards are not available for this drive: PG-X3, PG-B3, DI-A3, AI-A3, DO-A3, AO-A3
A communication option card has been installed in option port CN5-B.		Communication option cards are supported by option port CN5-A only. More than one comm. option cannot be installed.
Digital Operator Display		Fault Name
oFC00	oFC00	Option Card Connection Error at Option Port CN5-C
		Option compatibility error
Cause		Possible Solution
The option card installed into port CN5-C is incompatible with the drive.		Check if the drive supports the option card that you are attempting to instal. The following option cards are not available for this drive: PG-X3, PG-B3, DI-A3, AI-A3, DO-A3, AO-A3
A communication option card has been installed in option port CN5-C.		Communication option cards are supported by option port CN5-A only. More than one comm. option cannot be installed.
Digital Operator Display		Fault Name
oH	oH	Heatsink Overheat
		The temperature of the heatsink exceeded the overheat pre-alarm level set to L8-02. Default value for L8-02 is determined by drive capacity (o2-04).
Cause		Possible Solution
Surrounding temperature is too high.		<ul style="list-style-type: none"> • Check the temperature surrounding the drive. Verify temperature is within drive specifications. • Improve the air circulation within the enclosure panel. • Install a fan or air conditioner to cool the surrounding area. • Remove anything near the drive that might be producing excessive heat.
Load is too heavy.		<ul style="list-style-type: none"> • Measure the output current. • Decrease the load. • Lower the carrier frequency (C6-02).
Internal cooling fan is stopped.		<ul style="list-style-type: none"> • Replace the cooling fan. <i>Refer to Cooling Fan Component Names on page 290.</i> • After replacing the drive, reset the cooling fan maintenance parameter (o4-03 = 0).
Digital Operator Display		Fault Name
oH1	oH1	Overheat 1 (Heatsink Overheat)
		The temperature of the heatsink exceeded the drive overheat level. The overheat level is determined by drive capacity (o2-04).
Cause		Possible Solution
Surrounding temperature is too high.		<ul style="list-style-type: none"> • Check the temperature surrounding the drive. • Improve the air circulation within the enclosure panel. • Install a fan or air conditioner to cool the surrounding area. • Remove anything near the drive that might be producing excessive heat.
Load is too heavy.		<ul style="list-style-type: none"> • Measure the output current. • Lower the carrier frequency (C6-02). • Reduce the load.
Digital Operator Display		Fault Name
oH3	oH3	Motor Overheat Alarm (PTC Input)
		<ul style="list-style-type: none"> • The motor overheat signal to analog input terminal A1, A2, or A3 exceeded the alarm detection level. • Detection requires multi-function analog input H3-02, H3-06, or H3-10 be set to "E".
Cause		Possible Solution
Motor has overheated		<ul style="list-style-type: none"> • Check the size of the load, the accel/decel times, and the cycle times. • Decrease the load. • Increase the acceleration and deceleration times (C1-01 through C1-04). • 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 too much, as this reduces load tolerance at low speeds. • Check the motor rated current. • Enter the motor rated current as indicated on the motor nameplate (E2-01). • Ensure the motor cooling system is operating normally. • Repair or replace the motor cooling system.
Digital Operator Display		Fault Name
oH4	oH4	Motor Overheat Fault (PTC Input)
		<ul style="list-style-type: none"> • The motor overheat signal to analog input terminal A1, A2, or A3 exceeded the fault detection level. • Detection requires that multi-function analog input H3-02, H3-06, or H3-10 = "E".
Cause		Possible Solution
Motor has overheated.		<ul style="list-style-type: none"> • Check the size of the load, the accel/decel times, and the cycle times. • Decrease the load. • Increase the acceleration and deceleration times (C1-01 through C1-04). • 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 too much because this reduces load tolerance at low speeds. • Check the motor rated current. • Enter the motor rated current as indicated on the motor nameplate (E2-01). • Ensure the motor cooling system is operating normally. • Repair or replace the motor cooling system.

6.4 Fault Detection

Digital Operator Display		Fault Name
oL1	oL1	Motor Overload
		The electronic motor overload protection tripped.
Cause		Possible Solution
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).
A general purpose motor is driven below the rated speed with too high load.		<ul style="list-style-type: none"> Reduce the load. Increase the speed. If the motor is supposed to operate at low speeds, either increase the motor capacity or use a motor specifically designed to operate in the desired speed range.
The output voltage is too high.		Adjust the user-set V/f patterns (E1-04 through E1-10). Parameters E1-08 and E1-10 may need to be reduced. Be careful not to lower E1-08 and E1-10 too much because this reduces load tolerance at low speeds.
The wrong motor rated current is set to E2-01.		<ul style="list-style-type: none"> Check the motor-rated current. Enter the value written on the motor nameplate to parameter E2-01.
The maximum output frequency is set incorrectly.		<ul style="list-style-type: none"> Check the rated frequency indicated on the motor nameplate. Enter the rated frequency to E1-06 (Base Frequency).
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"> Check the motor characteristics. Correct the type of motor protection that has been selected (L1-01). Install an external thermal relay.
The electrical thermal relay is operating at the wrong level.		<ul style="list-style-type: none"> Check the current rating listed on the motor nameplate. Check the value set for the motor rated current (E2-01).
Motor overheated by overexcitation operation.		<ul style="list-style-type: none"> 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. Reduce the excitation deceleration gain (n3-13). Set L3-04 (Stall Prevention during Deceleration) to a value other than 4.
Speed Search related parameters are set incorrectly.		<ul style="list-style-type: none"> Check values set to Speed Search related parameters. Adjust the Speed Search current and Speed Search deceleration times (b3-02 and b3-03 respectively). After Auto-Tuning, enable Speed Estimation Speed Search (b3-24 = 1).
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.
Cause		Possible Solution
Load is too heavy.		Reduce the load.
Acceleration or deceleration times are too short.		Increase the settings for the acceleration and deceleration times (C1-01 through C1-04).
The output voltage is too high.		<ul style="list-style-type: none"> 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.
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"> Reduce the load when operating at low speeds. Replace the drive with a model that is one frame size larger. Lower the carrier frequency (C6-02).
Excessive torque compensation.		Reduce the torque compensation gain (C4-01) until there is no speed loss but less current.
Speed Search related parameters are set incorrectly.		<ul style="list-style-type: none"> Check the settings for all Speed Search related parameters. Adjust the current used during Speed Search and the Speed Search deceleration time (b3-03 and b3-02 respectively). After Auto-Tuning the drive, enable the Speed Estimation Speed Search (b3-24 = 1).
Output current fluctuation due to input phase loss		Check the power supply for phase loss.
Digital Operator Display		Fault Name
oL3	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 load.		Check the settings of parameters L6-02 and L6-03.
Fault on the machine side (e.g., machine is locked up).		Check the status of the load. Remove the cause of the fault.
Digital Operator Display		Fault Name
oL7	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"> Reduce deceleration times in parameters C1-02, C1-04, for applications that do not use High Slip Braking. Use dynamic braking options to shorten deceleration time.
Motor is driven by the load.		
Something on the load side is restricting deceleration.		
The overload time during High Slip Braking is too short.		<ul style="list-style-type: none"> Increase parameter n3-04 (High-slip Braking Overload Time). Install a thermal relay and increase the setting of n3-04 to the maximum value.
Digital Operator Display		Fault Name
oPr	oPr	External Digital Operator Connection Fault
		<ul style="list-style-type: none"> The external operator has been disconnected from the drive. Note: An oPr fault will occur when all of the following conditions are true: Output is interrupted when the operator is disconnected (o2-06 = 1). The Run command is assigned to the operator (b1-02 = 0 and LOCAL has been selected).
Cause		Possible Solution
External operator is not properly connected to the drive.		<ul style="list-style-type: none"> Check the connection between the operator and the drive. Replace the cable if damaged. Turn off the drive input power and disconnect the operator. Next reconnect the operator and turn the drive input power back on.

Digital Operator Display		Fault Name
OU	ov	Overvoltage
		Voltage in the DC bus has exceeded the overvoltage detection level. <ul style="list-style-type: none"> For 200 V class: approximately 410 V For 400 V class: approximately 820 V
Cause		Possible Solution
Deceleration time is too short and regenerative energy is flowing from the motor into the drive.		<ul style="list-style-type: none"> Increase the deceleration time (C1-02, C1-04). Install dynamic braking options. Enable stall prevention during deceleration (L3-04 = 1). Stall Prevention is enabled as the default setting.
Fast acceleration time causes the motor to overshoot the speed reference.		<ul style="list-style-type: none"> Check if sudden drive acceleration triggers an overvoltage alarm. Increase the acceleration time. Use longer S-curve acceleration and deceleration times. Enable the Overvoltage Suppression function (L3-11 = 1). Lengthen the S-curve at acceleration end.
Excessive braking load.		The braking torque was too high, causing regenerative energy to charge the DC bus. Reduce the braking torque, use a dynamic braking option, or lengthen decel time.
Surge voltage entering from the drive input power.		Install a DC reactor. Note: Voltage surge can result from a thyristor converter and phase advancing capacitor using the same input power supply.
Ground fault in the output circuit causing the DC bus capacitor to overcharge.		<ul style="list-style-type: none"> Check the motor wiring for ground faults. Correct grounding shorts and turn the power back on.
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"> Check the settings for Speed Search-related parameters. Enable Speed Search restart function (b3-19 greater than or equal to 1 to 10). Adjust the current level during Speed Search and the deceleration time (b3-02 and b3-03 respectively). Perform Stationary Auto-Tuning for line-to-line resistance and then enable Speed Estimation Speed Search (b3-24 = 1).
Drive input power voltage is too high.		<ul style="list-style-type: none"> Check the voltage. Lower drive input power voltage within the limits listed in the specifications.
Drive fails to operate properly due to noise interference.		<ul style="list-style-type: none"> Review the list of possible solutions provided for controlling noise. Review the section on handling noise interference and check the control circuit lines, main circuit lines, and ground wiring.
Load inertia has been set incorrectly.		<ul style="list-style-type: none"> Check the load inertia settings when using KEB, overvoltage suppression, or Stall Prevention during deceleration. Adjust the load inertia ratio in L3-25 to better match the load.
Motor hunting occurs.		<ul style="list-style-type: none"> Adjust the parameters that control hunting. Set the gain for Hunting Prevention (n1-02). Adjust the speed feedback detection suppression gain for PM motors (n8-45) and the time constant for pull-in current (n8-47).
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).
Cause		Possible Solution
There is phase loss in the drive input power.		<ul style="list-style-type: none"> Check for wiring errors in the main circuit drive input power. Correct the wiring.
There is loose wiring in the drive input power terminals.		<ul style="list-style-type: none"> Ensure the terminals are tightened properly. Apply the tightening torque as specified in this manual. <i>Refer to Wire Gauges and Tightening Torque on page 67</i>
There is excessive fluctuation in the drive input power voltage.		<ul style="list-style-type: none"> Check the voltage from the drive input power. Review the possible solutions for stabilizing the drive input power.
There is poor balance between voltage phases.		<ul style="list-style-type: none"> Stabilize drive input power or disable phase loss detection.
The main circuit capacitors are worn.		<ul style="list-style-type: none"> Check the maintenance time for the capacitors (U4-05). Replace the capacitor if U4-05 is greater than 90%. For instructions on replacing the capacitor, contact YASKAWA or your nearest sales representative. <p>Check for anything problems with the drive input power. If drive input power appears normal but the alarm continues to occur, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.</p>
Digital Operator Display		Fault Name
SEr	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"> Reduce the detection compensation gain during Speed Search (b3-10). Increase the current level when attempting Speed Search (b3-17). Increase the detection time during Speed Search (b3-18). Repeat Auto-Tuning.
The motor is coasting in the opposite direction of the Run command.		Enable Bi-Directional Speed Search (b3-14 = 1).
Digital Operator Display		Fault Name
STo	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 is set (YASKAWA motors only).		<ul style="list-style-type: none"> Enter the correct motor code for the PM being used into E5-01. For special-purpose motors, enter the correct data to all E5 parameters according to the test report provided for the motor.
Load is too heavy.		<ul style="list-style-type: none"> Increase the load inertia for PM motor (n8-55). Increase the pull-in current during accel/decel (n8-51). Reduce the load. Increase the motor or drive capacity.
Load inertia is too heavy.		Increase the load inertia for PM motor (n8-55).
Acceleration and deceleration times are too short.		<ul style="list-style-type: none"> Increase the acceleration and deceleration times (C1-01 through C1-04). Increase the S-curve acceleration and deceleration times (C2-01).
Speed response is too slow.		Increase the load inertia for PM motor (n8-55).

6.4 Fault Detection

Digital Operator Display		Fault Name
UL3	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 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.
Digital Operator Display		Fault Name
UL6	UL6	Motor Underload
		The weight of the load has fallen below the underload curve defined in L6-14.
Cause		Possible Solution
The output current has fallen below the motor underload curve defined in L6-14 for longer than the time set to L6-03.		Adjust the value set to L6-14 so that output current remains above the motor underload curve during normal operation.
Digital Operator Display		Fault Name
Uv1	Uv1	DC Bus Undervoltage
		One of the following conditions occurred while the drive was stopped: <ul style="list-style-type: none"> Voltage in the DC bus fell below the undervoltage detection level (L2-05) <ul style="list-style-type: none"> For 200 V class: approximately 190 V 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 has fallen below the level set to L2-05 for longer than the time set to L2-02.
Cause		Possible Solution
Input power phase loss.		<ul style="list-style-type: none"> The main circuit drive input power is wired incorrectly. Correct the wiring.
One of the drive input power wiring terminals is loose.		<ul style="list-style-type: none"> Ensure there are no loose terminals. Apply the tightening torque specified in this manual to fasten the terminals. <i>Refer to Wire Gauges and Tightening Torque on page 67</i>
There is a problem with the voltage from the drive input power.		<ul style="list-style-type: none"> Check the voltage. Correct the voltage to be within the range listed in drive input power specifications. If there is no problem with the power supply to the main circuit, check for problems with the main circuit magnetic contactor.
The power has been interrupted.		Correct the drive input power.
The main circuit capacitors are worn.		<ul style="list-style-type: none"> Check the maintenance time for the capacitors (U4-05). Replace either the control board or the entire drive if U4-05 exceeds 90%. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
The relay or contactor on the soft-charge bypass circuit is damaged.		<ul style="list-style-type: none"> Cycle power to the drive and see if the fault reoccurs. If the problem continues, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative. Check monitor U4-06 for the performance life of the soft-charge bypass. Replace either the control board or the entire drive if U4-06 exceeds 90%. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Digital Operator Display		Fault Name
Uv2	Uv2	Control Power Supply Voltage Fault
		Voltage is too low for the control drive input power.
Cause		Possible Solution
For models CIMR-E□2A0004 through 2A0056 and CIMR-E□4A0002 through 4A0031: L2-02 was changed from its default value without installing a Momentary Power Loss Ride-Thru unit.		Correct the setting to L2-02 or install an optional Momentary Power Loss Ride-Thru unit.
Control power supply wiring is damaged.		<ul style="list-style-type: none"> Cycle power to the drive. Check if the fault reoccurs. If the problem continues, replace the control board, the entire drive, or the control power supply.
Internal circuitry is damaged.		<ul style="list-style-type: none"> Cycle power to the drive. Check if the fault reoccurs. If the problem continues, 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		Fault Name
Uv3	Uv3	Undervoltage 3 (Soft-Charge Bypass Circuit Fault)
		The soft-charge bypass circuit has failed.
Cause		Possible Solution
The relay or contactor on the soft-charge bypass circuit is damaged.		<ul style="list-style-type: none"> Cycle power to the drive and see if the fault reoccurs. If the problem continues, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative. Check monitor U4-06 for the performance life of the soft-charge bypass. Replace either the control board or the entire drive if U4-06 exceeds 90%. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Digital Operator Display		Fault Name
voF	voF	Output Voltage Detection Fault
		Problem detected with the voltage on the output side of the drive.
Cause		Possible Solution
Hardware is damaged.		Replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.

<1> Displayed as $[PF00]$ or $[PF20]$ when occurring at drive power up. When one of the faults occurs after successfully starting the drive, the display will show $[PF01]$ or $[PF21]$.

6.5 Alarm Detection

◆ Alarm Codes, Causes, and Possible Solutions

Alarms are drive protection functions that do not necessarily cause the drive to stop. Once the cause of an alarm is removed, the drive will return to the same status it was before the alarm occurred.

When an alarm has been triggered, the ALM light on the digital operator display blinks and the alarm code display flashes. If a multi-function output is set for an alarm (H2-□□ = 10), that output terminal will be triggered.

Note: If a multi-function output is set to close when an alarm occurs (H2-□□ = 10), it will also close when maintenance periods are reached, triggering alarms LT-1 through LT-4 (triggered only if H2-□□ = 2F).

Table 6.11 Alarm Codes, Causes, and Possible Solutions

Digital Operator Display		Minor Fault Name
<i>AEr</i>	AEr	Communication Option Station Number Setting Error (CC-Link, CANopen, MECHATROLINK-II)
		Option card node address is outside the acceptable setting range.
Cause		Possible Solutions
Station number is set outside the possible setting range.		<ul style="list-style-type: none"> Set parameter F6-10 to the proper value if a CC-Link option card is used. Set parameter F6-35 to the proper value if a CANopen option card is used.
Digital Operator Display		Minor Fault Name
<i>bb</i>	bb	Baseblock
		Drive output interrupted as indicated by an external baseblock signal.
Cause		Possible Solutions
External baseblock signal was entered via one of the multi-function input terminals (S1 to S8).		Check external sequence and baseblock signal input timing.
Digital Operator Display		Minor Fault Name
<i>bUS</i>	bUS	Option Communication Error
		<ul style="list-style-type: none"> After initial communication was established, the connection was lost. Assign a Run command frequency reference to the option card.
Cause		Possible Solutions
Connection is broken or master controller stopped communicating.		<ul style="list-style-type: none"> Check for faulty wiring. Correct the wiring. Check for disconnected cables and short circuits. Repair as needed.
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"> The connector pins on the option card are not properly lined up with the connector pins on the drive. Reinstall the option card.
A data error occurred due to noise.		<ul style="list-style-type: none"> Check options available to minimize the effects of noise. Take steps to counteract noise in the control circuit wiring, main circuit lines and ground wiring. Try to reduce noise on the controller side. Use surge absorbers on magnetic contactors or other equipment causing the disturbance. Use recommended cables or some other type of shielded line. Ground the shield to the controller side or on the input power side. All wiring for comm. devices should be separated from drive input power lines. Install an EMC noise filter to the drive input power.
Digital Operator Display		Minor Fault Name
<i>CALL</i>	CALL	Serial Communication Transmission Error
		Communication has not yet been established.
Cause		Possible Solutions
Communications wiring is faulty, there is a short circuit, or something is not connected properly.		<ul style="list-style-type: none"> Check for wiring errors. Correct the wiring. Check for disconnected cables and short circuits. Repair as needed.
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"> Perform a self-diagnostics check. If the problem continues, replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
Termination resistor setting is incorrect.		A termination resistor must be installed at both ends of a communication line. Slave drives must have the internal termination resistor switch set correctly. Place DIP switch S2 to the ON position.
Digital Operator Display		Minor Fault Name
<i>CE</i>	CE	MEMOBUS/Modbus Communication Error
		Control data was not received correctly for two seconds.
Cause		Possible Solutions
A data error occurred due to noise.		<ul style="list-style-type: none"> Check options available to minimize the effects of noise. Take steps to counteract noise in the control circuit wiring, main circuit lines, and ground wiring. Reduce noise on the controller side. Use surge absorbers for the magnetic contactors or other components that may be causing the disturbance. Use only recommended shielded line. Ground the shield on the controller side or on the drive input power side. Separate all wiring for comm. devices from drive input power lines. Install an EMC noise filter to the drive input power supply.
Communication protocol is incompatible.		<ul style="list-style-type: none"> Check the H5 parameter settings as well as the protocol setting in the controller. Ensure settings are compatible.
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"> Check the PLC. Change the software settings in the PLC. Set a longer CE detection time (H5-09).
Incompatible PLC software settings or there is a hardware problem.		<ul style="list-style-type: none"> Check the PLC. Remove the cause of the error on the controller side.

6.5 Alarm Detection

Communications cable is disconnected or damaged.		<ul style="list-style-type: none"> Check the connector to make sure the cable has a signal. Replace the communications cable.
Digital Operator Display		Minor Fault Name
<i>CrST</i>	CrST	Cannot Reset
Cause		Possible Solutions
A fault reset command was entered while the Run command was still present.		<ul style="list-style-type: none"> Ensure that a Run command cannot be entered from the external terminals or option card during fault reset. Turn off the Run command.
Digital Operator Display		Minor Fault Name
<i>dnE</i>	dnE	Drive Disabled
Cause		Possible Solutions
<p>“Drive Enable” is set to a multi-function contact input (H1-□□ = 6A) and that signal was switched off.</p> <p>An input set for "Bypass/Drive enable 2" (H1-□□ = 70) is open while another input terminal that enables the Run command is closed.</p>		Check the operation sequence.
Digital Operator Display		Minor Fault Name
<i>EF</i>	EF	Forward/Reverse Run Command Input Error
		Both forward run and reverse run closed simultaneously for over 0.5 s.
Cause		Possible Solutions
Sequence error		Check the forward and reverse command sequence and correct the problem. Note: When minor fault EF detected, motor ramps to stop.
Digital Operator Display		Minor Fault Name
<i>EF0</i>	EF0	Option Card External Fault
		An external fault condition is present.
Cause		Possible Solutions
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"> Remove the cause of the external fault. Remove the external fault input from the PLC.
There is a problem with the PLC program.		Check the PLC program and correct problems.
Digital Operator Display		Minor 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.
<i>EF4</i>	EF4	External fault (input terminal S4)
		External fault at multi-function input terminal S4.
<i>EF5</i>	EF5	External fault (input terminal S5)
		External fault at multi-function input terminal S5.
<i>EF6</i>	EF6	External fault (input terminal S6)
		External fault at multi-function input terminal S6.
<i>EF7</i>	EF7	External fault (input terminal S7)
		External fault at multi-function input terminal S7.
<i>EF8</i>	EF8	External fault (input terminal S8)
		External fault at multi-function input terminal S8.
Cause		Possible Solutions
An external device has tripped an alarm function.		Remove the cause of the external fault and reset the multi-function input value.
Wiring is incorrect.		<ul style="list-style-type: none"> Ensure the signal lines have been connected properly to the terminals assigned for external fault detection (H1-□□ = 20 to 2F). Reconnect the signal line.
Multi-function contact inputs are set incorrectly.		<ul style="list-style-type: none"> Check if the unused terminals have been set for H1-□□ = 20 to 2F (External Fault). Change the terminal settings.
Digital Operator Display		Minor Fault Name
<i>FbH</i>	FbH	Excessive PI Feedback
		The PI 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 Solutions
Parameters settings for b5-36 and b5-37 are incorrect.		Check parameters b5-36 and b5-37.
PI 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 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
<i>FbL</i>	FbL	PI Feedback Loss
		The PI 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 Solutions
Parameters settings for b5-13 and b5-14 are incorrect.		Check parameters b5-13 and b5-14.

PI 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 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
Hbb	Hbb
	Hardware Baseblock Signal Input
	Both Hardware Baseblock Input channels are open.
Cause	Possible Solutions
Both Hardware Baseblock Inputs H1 and H2 are open.	<ul style="list-style-type: none"> Check signal status at the input terminals H1 and H2. Check the Sink/Source Selection for the digital inputs. If the Hardwire Baseblock function is not utilized, check if the terminals H1-HC, and H2-HC are linked.
Internally, both Hardware Baseblock channels are broken.	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
$HbbF$	HbbF
	Hardware Baseblock Signal Input
	One Hardware Baseblock channel is open while the other one is closed.
Cause	Possible Solutions
The signals to the Hardware Baseblock inputs are wrong or the wiring is incorrect.	Check signal status at the input terminals H1 and H2. If the Hardware Baseblock function is not utilized, the terminals H1-HC, and H2-HC must be linked.
One of the Hardware Baseblock channels is faulty.	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
HcA	HCA
	Current Alarm
	Drive current exceeded overcurrent warning level (150% of the rated current).
Cause	Possible Solutions
Load is too heavy.	Either reduce the load for applications with repetitive operation (repetitive stops and starts, etc.), or replace the drive.
Acceleration and deceleration times are too short.	<ul style="list-style-type: none"> Calculate the torque required during acceleration and for the inertia moment. If the torque level is not right for the load, take the following steps: Increase the acceleration and deceleration times (C1-01 through C1-04). Increase the capacity of the drive.
A special-purpose motor is being used, or the drive is attempting to run a motor greater than the maximum allowable capacity.	<ul style="list-style-type: none"> Check the motor capacity. Use a motor appropriate for the drive. Ensure the motor is within the allowable capacity range.
The current level increased due to Speed Search after a momentary power loss or while attempting to perform a fault restart.	The alarm will appear only briefly. There is no need to take action to prevent the alarm from occurring in such instances.
Digital Operator Display	Minor Fault Name
$LT-1$	LT-1
	Cooling Fan Maintenance Time
	The cooling fan has reached its expected maintenance period and may need to be replaced. Note: An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.
Cause	Possible Solutions
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
$LT-2$	LT-2
	Capacitor Maintenance Time
	The main circuit and control circuit capacitors are nearing the end of their expected performance life. Note: An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.
Cause	Possible Solutions
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
$LT-3$	LT-3
	Soft Charge Bypass Relay Maintenance Time
	The DC bus soft charge relay is nearing the end of its expected performance life. Note: An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.
Cause	Possible Solutions
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
$LT-4$	LT-4
	IGBT Maintenance Time (50%)
	IGBTs have reached 50% of their expected performance life. Note: An alarm output (H2-□□ = 10) will only be triggered if H2-□□ = 2F.
Cause	Possible Solutions
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 of the heatsink exceeded the overheat pre-alarm level set to L8-02 (90-100°C). Default value for L8-02 is determined by drive capacity (o2-04).
Cause	Possible Solutions
Surrounding temperature is too high	<ul style="list-style-type: none"> Check the surrounding temperature. Improve the air circulation within the enclosure panel. Install a fan or air conditioner to cool surrounding area. Remove anything near drive that may cause extra heat.

6.5 Alarm Detection

Internal cooling fan has stopped.	<ul style="list-style-type: none"> Replace the cooling fan. <i>Refer to Cooling Fan Component Names on page 290.</i> After replacing the drive, reset the cooling fan maintenance parameter to (o4-03 = "0").
Airflow around the drive is restricted.	<ul style="list-style-type: none"> Provide proper installation space around the drive as indicated in the manual. <i>Refer to Installation Orientation and Spacing on page 40.</i> Allow for the specified space and ensure that there is sufficient circulation around the control panel. Check for dust or foreign materials clogging cooling fan. Clear debris caught in the fan that restricts air circulation.
Digital Operator Display	Minor Fault Name
 oH2	Drive Overheat Warning
Cause	Possible Solutions
An external device triggered an overheat warning in the drive.	<ul style="list-style-type: none"> Search for the device that tripped the overheat warning. Solving the problem will clear the warning.
Digital Operator Display	Minor Fault Name
 oH3	Motor Overheat
Cause	Possible Solutions
Motor thermostat wiring is fault (PTC input).	Repair the PTC input wiring.
There is a fault on the machine side (e.g., the machine is locked up).	<ul style="list-style-type: none"> Check the status of the machine. Remove the cause of the fault.
Motor has overheated.	<ul style="list-style-type: none"> Check the load size, accel/decel times, and cycle times. Decrease the load. Increase accel and decel times (C1-01 to C1-04). Adjust the preset V/f pattern (E1-04 through E1-10). This will mainly involve reducing E1-08 and E1-10. Note: Do not lower E1-08 and E1-10 excessively, because this reduces load tolerance at low speeds. Check the motor-rated current. Enter motor-rated current on motor nameplate (E2-01). Ensure the motor cooling system is operating normally. Repair or replace the motor cooling system.
Digital Operator Display	Minor Fault Name
 oL3	Overtorque 1
Cause	Possible Solutions
Inappropriate parameter settings.	Check parameters L6-02 and L6-03.
There is a fault on the machine side (e.g., the machine is locked up).	<ul style="list-style-type: none"> Check the status of the machine. Remove the cause of the fault.
Digital Operator Display	Minor Fault Name
 ov	DC Bus Overvoltage
Cause	Possible Solutions
Surge voltage present in the drive input power.	<ul style="list-style-type: none"> Install a DC reactor or an AC reactor. Voltage surge can result from a thyristor convertor and a phase advancing capacitor operating on the same drive input power system.
The motor is short-circuited.	<ul style="list-style-type: none"> Check the motor power cable, relay terminals and motor terminal box for short circuits. Correct grounding shorts and turn the power back on.
Ground current has over-charged the main circuit capacitors via the drive input power.	
Noise interference causes the drive to operate incorrectly.	<ul style="list-style-type: none"> Review possible solutions for handling noise interference. Review section on handling noise interference and check control circuit lines, main circuit lines and ground wiring. If the magnetic contactor is identified as a source of noise, install a surge protector to the MC coil.
Digital Operator Display	Minor Fault Name
 PASS	MEMOBUS/Modbus Comm. Test Mode Complete
Cause	Possible Solutions
MEMOBUS/Modbus test has finished normally.	This verifies that the test was successful.
Digital Operator Display	Minor Fault Name
 SE	MEMOBUS/Modbus Communication Test Mode Error
Cause	Possible Solutions
A digital input set to 67H (MEMOBUS/Modbus test) was closed while the drive was running.	Stop the drive and run the test again.
Digital Operator Display	Minor Fault Name
 TrPC	IGBT Maintenance Time (90%)
Cause	Possible Solutions
IGBTs have reached 90% of their expected performance life.	Replace the drive.

Digital Operator Display		Minor Fault Name
UL3	UL3	Undertorque Detection 1
		Drive output current less than L6-02 for longer than L6-03 time.
Cause		Possible Solutions
Inappropriate parameter settings.		Check parameters L6-02 and L6-03.
Load has dropped or decreased significantly.		Check for broken parts in the transmission system.
Digital Operator Display		Minor Fault Name
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"> DC bus voltage dropped below the level specified in L2-05. Contactor to suppress inrush current in the drive was opened. 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.
Cause		Possible Solutions
Phase loss in the drive input power.		Check for wiring errors in the main circuit drive input power. Correct the wiring.
Loose wiring in the drive input power terminals.		<ul style="list-style-type: none"> Ensure the terminals have been properly tightened. Apply the tightening torque to the terminals as specified. <i>Refer to Wire Gauges and Tightening Torque on page 67</i>
There is a problem with the drive input power voltage.		<ul style="list-style-type: none"> Check the voltage. Lower the voltage of the drive input power so that it is within the limits listed in the specifications.
Drive internal circuitry is worn.		<ul style="list-style-type: none"> Check the maintenance time for the capacitors (U4-05). Replace either the control board or the entire drive if U4-05 exceeds 90%. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
The drive input power transformer is too small and voltage drops when the power is switched on.		<ul style="list-style-type: none"> Check for an alarm when the magnetic contactor, line breaker, and leakage breaker are closed. Check the capacity of the drive input power transformer.
Air inside the drive is too hot.		<ul style="list-style-type: none"> Check the temperature inside the drive.
The CHARGE light is broken or disconnected.		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
voF	voF	Output Voltage Detection Fault
		There is a problem with the output voltage.
Cause		Possible Solutions
Hardware is damaged.		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
WrUn	WrUn	Waiting to run
		A Run command has been issued and the drive is waiting to begin running the motor.
Cause		Possible Solutions
Once a Run command has been entered, the drive must wait for the time set in b1-11 to pass before it can begin to operate the motor.		Not an error.

6.6 Operator Programming Errors

◆ oPE Codes, Causes, and Possible Solutions

An Operator Programming Error (oPE) occurs when a contradictory parameter is set or an individual parameter is set to an inappropriate value.

The drive will not operate until the parameter or parameters causing the problem are set correctly. An oPE, however, does not trigger an alarm or fault output. If an oPE occurs, investigate the cause and [Refer to oPE Codes, Causes, and Possible Solutions on page 266](#) for the appropriate action. When an oPE appears on the operator display, press the ENTER button to view U1-18 and see the parameter that is causing the oPE error (U1-18).

Table 6.12 oPE Codes, Causes, and Possible Solutions

Digital Operator Display		Error Name
	oPE01	Drive Capacity Setting Fault
Cause		Possible Solutions
The drive model selection (o2-04) and the actual capacity of the drive are not the same.		Correct the value set to o2-04.
Drive capacity and the value set to o2-04 do not match.		
Digital Operator Display		Error Name
	oPE02	Parameter Range Setting Error
Cause		Possible Solutions
Parameters were set outside the possible setting range.		Use U1-18 to find parameters set outside the range.
Set parameters to the proper values.		
Note: When multiple errors occur at the same time, other errors are given precedence over oPE02.		
Digital Operator Display		Error Name
	oPE03	Multi-Function Input Selection Error
Cause		Possible Solutions
A contradictory setting is assigned to multi-function contact inputs H1-01 to H1-08.		
The same function is assigned to two multi-function inputs. (excludes "Not used" and "External Fault.")		<ul style="list-style-type: none"> • Ensure all multi-function inputs are assigned to different functions. • Re-enter the multi-function settings to ensure this does not occur.
The Up command was set but the Down command was not, or vice versa (settings 10 vs. 11).		Correctly set functions that need to be enabled in combination with other functions.
<ul style="list-style-type: none"> • Run/Stop command for a Three-wire sequence was set (H1-□□ = 42), but Forward/Reverse command (H1-□□ = 43) was not. • "Drive Enable" is not selected but H2-□□ is selected during DriveEnable status. • "Drive Enable" is set to multi-function input S1 or S2 (H1-01 = 6A or H1-02 = 6A). • Although the drive has not been set for 3-wire operation, an input terminal is set for Jog 2 (H1-□□ = 69). 		Correctly set functions that need to be enabled in combination with other functions.
Two of the following functions are set at the same time:		<ul style="list-style-type: none"> • Check if contradictory settings have been assigned to the multi-function input terminals at the same time. • Correct setting errors.
<ul style="list-style-type: none"> • Up/Down Command (10 vs. 11) • Hold Accel/Decel Stop (A) • Analog Frequency Reference Sample/Hold (1E) • Offset Frequency 1, 2, 3 Calculations (44, 45, 46) • Alternative reference N.O. and Alternative reference N.C.(2 vs. 70) • External reference 1/2 and Alternative reference 2 (2 vs. 36) • Motor pre-heat 2 and Motor pre-heat 1 (50 vs. 60) 		
The Up/Down command (10, 11) is enabled at the same time as PI control (b5-01).		Disable control PI (b5-01 = 0) or disable the Up/Down command.
Settings for N.C. and N.O. input for the following functions were selected at the same time:		Check for contradictory settings assigned to the multi-function input terminals at the same time. Correct setting errors.
<ul style="list-style-type: none"> • External Search Command 1 and External Search Command 2 (61 vs. 62) • Fast Stop N.O. and Fast Stop N.C. (15 vs. 17) • KEB for Momentary Power Loss and High Slip Braking (65, 66, 7A, 7B vs. 68) • Motor Switch Command and Accel/Decel Time 2 (16 vs. 1A) • KEB Command 1 and KEB Command 2 (65, 66 vs. 7A, 7B) • FWD Run Command (or REV) and FWD/REV Run Command (2-wire) (40, 41 vs. 42, 43) • External DB Command and Drive Enable (60 vs. 6A) 		
One of the following settings was entered while H1-□□ = 2 (External Reference 1/2):		Correct the settings for the multi-function input terminal parameters.
<ul style="list-style-type: none"> • b1-15 = 4 (Pulse Train Input) but the pulse train input selection is not set for the frequency reference (H16-01 > 0) • b1-15 or b1-16 set to 3 but no option card is connected • Although b1-15 = 1 (Analog Input) and H3-02 or H3-10 are set to 0 (Frequency Bias) 		
H2-□□ = 38 (Drive Enabled) but H1-□□ is not set to 6A (Drive Enable).		
Digital Operator Display		Error Name
	oPE04	Initialization required.
Cause		Possible Solutions
The drive, control board, or terminal board has been replaced and the parameter settings between the control board and the terminal board no longer match.		To load the parameter settings to the drive that are stored in the terminal board, set A1-03 to 5550. Initialize parameters after drive replacement by setting A1-03 to 1110 or 2220.

Digital Operator Display		Error Name
oPE05	oPE05	Run Command/Frequency Reference Source Selection Error
Cause		Possible Solutions
Frequency reference is assigned to an option card (b1-01 = 3) but an input option card is not connected to the drive.		Reconnect the input option card to the drive.
The Run command is assigned to an option card (b1-02 = 3) but an input option card is not connected to the drive.		
Frequency reference is assigned to the pulse train input (b1-01 = 4), but terminal RP is not set for frequency reference input (H6-01 > 0)		Set H6-01 to "0".
Although a communication option card is not connected to the drive, b1-16 is set to 3 while H1-□□ is set to 4 or 36.		
Digital Operator Display		Error Name
oPE07	oPE07	Multi-Function Analog Input Selection Error
Cause		Possible Solutions
A contradictory setting is assigned to multi-function analog inputs H3-02, H3-06, or H3-10 and PI functions conflict.		Change the settings to H3-02, H3-06, and H3-10 so that functions no longer conflict. Note: Both 0 (frequency reference bias) and F (not used) can be set to H3-02, H3-06, and H3-10 at the same time.
At least two analog input terminals are set to the same function (i.e., at least two of these parameters has the same setting: H3-02, H3-06, or H3-10).		
The following simultaneous contradictory settings: • H3-02, H3-06, or H3-10 = B (PI Feedback) while H6-01 (Pulse Train Input) = 1 (PI Feedback) • H3-02, H3-06, or H3-10 = C (PI Target Value) while H6-01 = 2 (pulse train input sets the PI target value) • H3-02, H3-06, or H3-10 = C (PI Target Value) while b5-18 = 1 (enables b5-19 as the target PI value) • H6-01 = 2 (PI target) while b5-18 = 1 (enables b5-19 as the target PI value)		Disable one of the PI selections.
Digital Operator Display		Error Name
oPE08	oPE08	Parameter Selection Error
Cause		Possible Solutions
A function has been set that cannot be used in the motor control method selected.		Check the motor control method and the functions available.
Attempted to use a function that is not valid for the selected control mode.		
In OLV/PM, parameters E5-02 to E5-07 are set to 0.		<ul style="list-style-type: none"> Set the correct motor code in accordance with the motor being used (E5-01). When using a special-purpose motor, set E5-□□ in accordance with the test report provided.
The following settings have occurred in OLV/PM: • E5-03 does not equal 0 • E5-09 and E5-24 are both equal to 0, or neither equals 0		<ul style="list-style-type: none"> Set E5-09 or E5-24 to the correct value, and set the other to "0". Set the motor rated current for PM to "0" (E5-03).
Note: Use U1-18 to find which parameters are set outside the specified setting range. Other errors are given precedence over oPE08 when multiple errors occur at the same time.		
Digital Operator Display		Error Name
oPE09	oPE09	PI Control Selection Fault
Cause		Possible Solutions
PI control function selection is incorrect. Requires that PI control is enabled (b5-01 = 1 or 3).		Correct the parameter settings.
The following simultaneous contradictory settings have occurred: • b5-15 is not set to 0.0 (PI Sleep Function Operation Level) • The stopping method is set to either DC Injection Braking or coast to stop with a timer (b1-03 = 2 or 3).		
PI control is set to b5-01 = 1, but the lower limit for the frequency reference (d2-02) is not set to 0 while reverse output is enabled (b5-11 = 1).		Correct the parameter settings.
PI control is set to b5-01 = 3, but the lower limit for the frequency reference (d2-01) is not 0.		Correct the parameter settings.
Digital Operator Display		Error Name
oPE10	oPE10	V/f Data Setting Error
Cause		Possible Solutions
The following setting errors have occurred where: • E1-04 is greater than or equal to E1-06, E1-06 is greater than or equal to E1-07, E1-07 is greater than or equal to E1-09, or E1-09 is greater than or equal to E1-11.		Correct the settings for E1-04, E1-06, E1-07, E1-09, and E1-11.
—		
Digital Operator Display		Error Name
oPE11	oPE11	Carrier Frequency Setting Error
Cause		Possible Solutions
Carrier frequency setting error. Correct the setting for the carrier frequency.		Correct the parameter settings.
The following simultaneous contradictory settings: C6-05 is greater than 6 and C6-04 is greater than C6-03 (carrier frequency lower limit is greater than the upper limit). If C6-05 is less than or equal to 6, the drive operates at C6-03.		
Upper and lower limits between C6-02 and C6-05 contradict each other.		
Digital Operator Display		Error Name
oPE13	oPE13	Pulse Monitor Selection Error
Cause		Possible Solutions
Incorrect setting of monitor selection for pulse train (H6-06).		Change scaling for the pulse train monitor or set H6-06 to 101, 102, 105, or 116.
Scaling for the pulse train monitor is set to 0 (H6-07 = 0) while H6-06 is not set to 101, 102, 105, or 116.		

6.6 Operator Programming Errors

Digital Operator Display		Error Name
oPE 16	oPE16	Energy Savings Constants Error
Cause		Possible Solutions
In AOLV/PM the automatically calculated energy saving coefficients are out of the allowable range.		Check and correct the motor data in E5 parameters.

6.7 Auto-Tuning Fault Detection

Auto-Tuning faults are shown below. When the following faults are detected, the fault is displayed on the digital operator and the motor coasts to a stop. Auto-Tuning faults do not trigger an multi-function terminal set for fault or alarm output.

An End□ error indicates that although Auto-Tuning has completely successful, there is some discrepancy in the calculations the drive made. If an End□ error occurs, check for what might be causing the error using the table below, and perform Auto-Tuning again once the problem has been taken care of. If there appears to be no problem despite the End□ error being displayed, go ahead and start the application.

◆ Auto-Tuning Codes, Causes, and Possible Solutions

Table 6.13 Auto-Tuning Codes, Causes, and Possible Solutions

Digital Operator Display		Error Name
<i>End1</i>	End1	Excessive V/f Setting (detected only during Rotational Auto-Tuning for V/f control (T1-01 = 3), and displayed after Auto-Tuning is complete)
Cause		Possible Solutions
The torque reference exceeded 20% during Auto-Tuning.		<ul style="list-style-type: none"> • Before Auto-Tuning the drive, verify the information written on the motor nameplate and enter that data to T1-03 through T1-05. • Enter proper information to parameters T1-03 to T1-05 and repeat Auto-Tuning. • If possible, disconnect the motor from the load and perform Auto-Tuning. If the load cannot be uncoupled, simply use the Auto-Tuning results as they are.
The results from Auto-Tuning the no-load current exceeded 80%.		
Digital Operator Display		Error Name
<i>End3</i>	End3	Rated Current Setting Alarm (displayed after Auto-Tuning is complete)
Cause		Possible Solutions
The correct current rating printed on the nameplate was not entered into T1-04.		<ul style="list-style-type: none"> • Check the setting of parameter T1-04. • Check the motor data and repeat Auto-Tuning.
Digital Operator Display		Error Name
<i>End4</i>	End4	Adjusted Slip Calculation Error
Cause		Possible Solutions
The slip that was calculated is outside the allowable range.		<ul style="list-style-type: none"> • Make sure the data entered for Auto-Tuning is correct.
Digital Operator Display		Error Name
<i>End5</i>	End5	Resistance Tuning Error
Cause		Possible Solutions
The resistance value that was calculated is outside the allowable range.		<ul style="list-style-type: none"> • Double check the data that was entered for the Auto-Tuning process. • Check the motor and motor cable connection for faults.
Digital Operator Display		Error Name
<i>End7</i>	End7	No-Load Current Alarm
Cause		Possible Solutions
The entered no-load current value was outside the allowable range.		Check and correct faulty motor wiring.
Auto-Tuning results were less than 5% of the motor rated current.		Double check the data that was entered for the Auto-Tuning process.
Digital Operator Display		Error Name
<i>Er-01</i>	Er-01	Motor Data Error
Cause		Possible Solutions
Motor data or data entered during Auto-Tuning was incorrect.		<ul style="list-style-type: none"> • Check that the motor data entered to T1 parameters matches motor nameplate input before Auto-Tuning. • Start Auto-Tuning over again and enter the correct information.
Motor output power and motor-rated current settings (T1-02 and T1-04) do not match.		<ul style="list-style-type: none"> • Check the drive and motor capacities. • Correct the settings of parameters T1-02 and T1-04.
Base frequency and motor rated speed (T1-05 and T1-07) do not match.		<ul style="list-style-type: none"> • Set T1-05 and T1-07 to the correct value. • Check if the correct pole number was entered to T1-06.
Digital Operator Display		Error Name
<i>Er-02</i>	Er-02	Minor Fault
Cause		Possible Solutions
An alarm was triggered during Auto-Tuning.		Exit the Auto-Tuning menu, check the alarm code, remove the alarm cause, and repeat Auto-Tuning.
Digital Operator Display		Error Name
<i>Er-03</i>	Er-03	STOP Button Input
Cause		Possible Solutions
Auto-Tuning canceled by pressing STOP button.		Auto-Tuning did not complete properly and will have to be performed again.

6.7 Auto-Tuning Fault Detection

Digital Operator Display		Error Name
Er-04	Er-04	Line-to-Line Resistance Error
Cause		Possible Solutions
Motor data entered during Auto-Tuning was incorrect.		<ul style="list-style-type: none"> Make sure the data entered to the T1 parameters match the information written on the motor nameplate. Restart Auto-Tuning and enter the correct information.
Results from Auto-Tuning are outside the parameter setting range or the tuning process took too long.		Check and correct faulty motor wiring.
Motor cable or cable connection faulty.		
Digital Operator Display		Error Name
Er-05	Er-05	No-Load Current Error
Cause		Possible Solutions
Motor data entered during Auto-Tuning was incorrect.		<ul style="list-style-type: none"> Make sure the data entered to the T1 parameters match the information written on the motor nameplate. Restart Auto-Tuning and enter the correct information.
Results from Auto-Tuning are outside the parameter setting range or the tuning process took too long.		<ul style="list-style-type: none"> Check and correct faulty motor wiring. Perform Rotational Auto-Tuning.
The load during Rotational Auto-tuning was too high.		<ul style="list-style-type: none"> Disconnect the motor from machine and restart Auto-Tuning. If motor and load cannot be uncoupled make sure the load is lower than 30%. If a mechanical brake is installed, make sure it is fully lifted during tuning.
Digital Operator Display		Error Name
Er-08	Er-08	Rated Slip Error
Cause		Possible Solutions
Motor data entered during Auto-Tuning was incorrect.		<ul style="list-style-type: none"> Make sure the data entered to the T1 parameters match the information written on the motor nameplate. Restart Auto-Tuning and enter the correct information.
Drive-calculated values outside parameter setting range or the tuning process took too long.		<ul style="list-style-type: none"> Check and correct faulty motor wiring. Perform Rotational Auto-Tuning for V/f control (T1-01 = 3).
The load during rotational Auto-tuning was too high.		<ul style="list-style-type: none"> Disconnect the motor from machine and restart Auto-Tuning. If motor and load cannot be uncoupled make sure the load is lower than 30%. If a mechanical brake is installed, make sure it is fully lifted during tuning.
Digital Operator Display		Error Name
Er-09	Er-09	Acceleration Error
Cause		Possible Solutions
The motor did not accelerate for the specified acceleration time.		<ul style="list-style-type: none"> Increase the acceleration time (C1-01). Check if it is possible to disconnect the machine from the motor.
The load during Rotational Auto-Tuning for V/f control (T1-01 = 3) was too high.		<ul style="list-style-type: none"> Disconnect the motor from machine and restart Auto-Tuning. If motor and load cannot be uncoupled make sure the load is lower than 30%. If a mechanical brake is installed, make sure it is fully lifted during tuning.
Digital Operator Display		Error Name
Er-11	Er-11	Motor Speed Fault
Cause		Possible Solutions
Torque reference is too high.		<ul style="list-style-type: none"> Increase the acceleration time (C1-01). Disconnect the machine from the motor, if possible.
Digital Operator Display		Error Name
Er-12	Er-12	Current Detection Error
Cause		Possible Solutions
One of the motor phases is missing: (U/T1, V/T2, W/T3).		Check motor wiring and correct any problems.
Current exceeded the current rating of the drive.		<ul style="list-style-type: none"> Check the motor wiring for a short between motor lines. If a magnetic contactor is used between motors, make sure it is closed. Replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.
The current is too low.		
Attempted Auto-Tuning without motor connected to the drive.		Connect the motor and perform Auto-Tuning.
Current detection signal error.		Replace either the control board or the entire drive. For instructions on replacing the control board, contact YASKAWA or your nearest sales representative.