

# Chapter 6 Fault Code Information and Maintenance

## 6.1 Fault Code Information

The AC motor drive has a comprehensive fault diagnostic system that includes several different alarms and fault messages. Once a fault is detected, the corresponding protective functions will be activated. The following faults are displayed as shown on the AC motor drive digital keypad display. The six most recent faults can be read from the digital keypad or communication.



Wait 5 seconds after a fault has been cleared before performing reset via keypad of input terminal.

### 6.1.1 Common Problems and Solutions

Fault Name	Fault Descriptions	Corrective Actions
ocA	<b>Over-current during acceleration</b> (Output current exceeds triple rated current during acceleration.)	<ol style="list-style-type: none"><li>1. Short-circuit at motor output: Check for possible poor insulation at the output lines.</li><li>2. Acceleration Time too short: Increase the Acceleration Time.</li><li>3. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.</li></ol>
ocD	<b>Over-current during deceleration</b> (Output current exceeds triple rated current during deceleration.)	<ol style="list-style-type: none"><li>1. Short-circuit at motor output: Check for possible poor insulation at the output line.</li><li>2. Deceleration Time too short: Increase the Deceleration Time.</li><li>3. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.</li></ol>
ocN	<b>Over-current during steady state operation</b> (Output current exceeds triple rated current during constant speed.)	<ol style="list-style-type: none"><li>1. Short-circuit at motor output: Check for possible poor insulation at the output line.</li><li>2. Sudden increase in motor loading: Check for possible motor stall.</li><li>3. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.</li></ol>
ocS	Hardware failure in current detection	Return to the factory

Fault Name	Fault Descriptions	Corrective Actions
GFF	Ground fault	<p>When (one of) the output terminal(s) is grounded, short circuit current is more than 50% of AC motor drive rated current, the AC motor drive power module may be damaged.</p> <p><b>NOTE: The short circuit protection is provided for AC motor drive protection, not for protection of the user.</b></p> <ol style="list-style-type: none"> <li>1. Check the wiring connections between the AC motor drive and motor for possible short circuits, also to ground.</li> <li>2. Check whether the IGBT power module is damaged.</li> <li>3. Check for possible poor insulation at the output line.</li> </ol>
OCC	Short-circuit is detected between upper bridge and lower bridge of the IGBT module	Return to the factory
OvA	DC BUS over-voltage during acceleration (230V: DC 450V; 460V: DC 900V)	<ol style="list-style-type: none"> <li>1. Check if the input voltage falls within the rated AC motor drive input voltage range.</li> <li>2. Check for possible voltage transients.</li> <li>3. If DC BUS over-voltage due to regenerative voltage, please increase the Deceleration Time or add an optional brake resistor.</li> </ol>
OvD	DC BUS over-voltage during deceleration (230V: DC 450V; 460V: DC 900V)	
OvN	DC BUS over-voltage in constant speed (230V: DC 450V; 460V: DC 900V)	
OvS	Hardware failure in voltage detection	Check if input voltage is within specification range and monitor if there is surge voltage.
LVA	DC BUS voltage is less than Pr.06-00 during acceleration	<ol style="list-style-type: none"> <li>1. Check if the input voltage is normal</li> <li>2. Check for possible sudden load</li> </ol>
LVd	DC BUS voltage is less than Pr.06-00 during deceleration	
LVn	DC BUS voltage is less than Pr.06-00 in constant speed	
PHL	Phase Loss	Check Power Source Input if all 3 input phases are connected without loose contacts. For models 40hp and above, please check if the fuse for the AC input circuit is blown.


Fault Name	Fault Descriptions	Corrective Actions
OH1	<b>IGBT overheating</b> IGBT temperature exceeds protection level 1 to15HP: 90 °C 20 to 100HP: 100 °C	<ol style="list-style-type: none"> <li>1. Ensure that the ambient temperature falls within the specified temperature range.</li> <li>2. Make sure that the ventilation holes are not obstructed.</li> <li>3. Remove any foreign objects from the heatsinks and check for possible dirty heat sink fins.</li> <li>4. Check the fan and clean it.</li> <li>5. Provide enough spacing for adequate ventilation.</li> </ol>
OH2	<b>Heatsink overheating</b> Heat sink temperature exceeds 90°C	<ol style="list-style-type: none"> <li>1. Ensure that the ambient temperature falls within the specified temperature range.</li> <li>2. Make sure that the ventilation holes are not obstructed.</li> <li>3. Remove any foreign objects from the heatsinks and check for possible dirty heat sink fins.</li> <li>4. Check the fan and clean it.</li> <li>5. Provide enough spacing for adequate ventilation.</li> </ol>
OH3	<b>Motor overheating</b> The AC motor drive detects that the internal temperature exceeds Pr.06-30 (PTC level)	<ol style="list-style-type: none"> <li>1. Make sure that the motor is not obstructed.</li> <li>2. Ensure that the ambient temperature falls within the specified temperature range.</li> <li>3. Take the next higher power AC motor drive model.</li> </ol>
EH10	OH1 hardware failure	Return to the factory
EH20	OH2 hardware failure	Return to the factory
FRn	<b>Fan failure</b>	<ol style="list-style-type: none"> <li>1. Make sure that the fan is not obstructed.</li> <li>2. Return to the factory</li> </ol>
OL	<b>Overload</b> The AC motor drive detects excessive drive output current. <b>NOTE: The AC motor drive can withstand up to 150% of the rated current for a maximum of 60 seconds.</b>	<ol style="list-style-type: none"> <li>1. Check whether the motor is overloaded.</li> <li>2. Take the next higher power AC motor drive model.</li> </ol>
EO11	<b>Motor 1 overload</b>	<ol style="list-style-type: none"> <li>1. Check whether the motor 1 is overloaded.</li> <li>2. Check whether the rated current of motor 1 (Pr.05-01) is suitable</li> <li>3. Take the next higher power AC motor drive model.</li> </ol>
EO12	<b>Motor 2 overload</b>	<ol style="list-style-type: none"> <li>1. Check whether the motor 2 is overloaded.</li> <li>2. Check whether the rated current of motor 2 (Pr.05-13) is suitable</li> <li>3. Take the next higher power AC motor drive model.</li> </ol>

Fault Name	Fault Descriptions	Corrective Actions
$FUSE$	<b>Broken fuse</b> The fuse at DC side is broken for 30hp and below	<ol style="list-style-type: none"> <li>1. Check whether the fuse of the transistor module is functioning well</li> <li>2. Check whether the loading side is short-circuit</li> </ol>
$ot1$	<b>Electronic Thermal Relay 1 Protection</b>	<ol style="list-style-type: none"> <li>1. Check whether the motor is overloaded.</li> <li>2. Check whether motor rated current setting (Pr.05-01) is suitable</li> </ol>
$ot2$	<b>Electronic Thermal Relay 2 Protection</b>	<ol style="list-style-type: none"> <li>3. Check electronic thermal relay function</li> <li>4. Take the next higher power AC motor drive model.</li> </ol>
$cF1$	<b>Internal EEPROM can not be programmed.</b>	<ol style="list-style-type: none"> <li>1. Press "RESET" key to the factory setting</li> <li>2. Return to the factory.</li> </ol>
$cF2$	<b>Internal EEPROM can not be read.</b>	<ol style="list-style-type: none"> <li>1. Press "RESET" key to the factory setting</li> <li>2. Return to the factory.</li> </ol>
$cd0$	<b>Hardware failure in current detection</b>	Re-power on to try it. If fault code is still displayed on the keypad please return to the factory
$cd1$	<b>U-phase error</b>	
$cd2$	<b>V-phase error</b>	
$cd3$	<b>W-phase error</b>	
$Hd0$	<b>CC (current clamp)</b>	Re-power on to try it. If fault code is still displayed on the keypad please return to the factory
$Hd1$	<b>OC hardware error</b>	
$Hd2$	<b>OV hardware error</b>	
$Hd3$	<b>GFF hardware error</b>	
$RUE$	<b>Auto tuning error</b>	<ol style="list-style-type: none"> <li>1. Check cabling between drive and motor</li> <li>2. Retry again</li> </ol>
$RFE$	<b>PID loss (ACI)</b>	<ol style="list-style-type: none"> <li>1. Check the wiring of the PID feedback</li> <li>2. Check the PID parameters settings</li> </ol>
$PGF1$	<b>PG feedback error</b>	Check if Pr.10-01 is set to 0 when it is PG feedback control
$PGF2$	<b>PG feedback loss</b>	Check the wiring of the PG feedback
$PGF3$	<b>PG feedback stall</b>	<ol style="list-style-type: none"> <li>1. Check the wiring of the PG feedback</li> <li>2. Check if the setting of PI gain and deceleration is suitable</li> </ol>
$PGF4$	<b>PG slip error</b>	<ol style="list-style-type: none"> <li>3. Return to the factory</li> </ol>
$PGr1$	<b>Pulse input error</b>	<ol style="list-style-type: none"> <li>1. Check the pulse wiring</li> </ol>
$PGr2$	<b>Pulse input loss</b>	<ol style="list-style-type: none"> <li>2. Return to the factory</li> </ol>
$RCE$	<b>ACI loss</b>	<ol style="list-style-type: none"> <li>1. Check the ACI wiring</li> <li>2. Check if the ACI signal is less than 4mA</li> </ol>
$EF$	<b>External Fault</b>	<ol style="list-style-type: none"> <li>1. Input EF (N.O.) on external terminal is closed to GND. Output U, V, W will be turned off.</li> <li>2. Give RESET command after fault has been cleared.</li> </ol>
$EF1$	<b>Emergency stop</b>	<ol style="list-style-type: none"> <li>1. When the multi-function input terminals MI1 to MI6 are set to emergency stop, the AC motor drive stops output U, V, W and the motor coasts to stop.</li> <li>2. Press RESET after fault has been cleared.</li> </ol>

Fault Name	Fault Descriptions	Corrective Actions
bb	External Base Block	<ol style="list-style-type: none"> <li>When the external input terminal (B.B) is active, the AC motor drive output will be turned off.</li> <li>Deactivate the external input terminal (B.B) to operate the AC motor drive again.</li> </ol>
PcodE	Password is locked.	Keypad will be locked. Turn the power ON after power OFF to re-enter the correct password. See Pr.00-07 and 00-08.
cE1	Illegal function code	Check if the function code is correct (function code must be 03, 06, 10, 63)
cE2	Illegal data address	Check if the communication address is correct
cE3	Illegal data value	Check if the data value exceeds max./min. value
cE4	Slave device failure	Check the connection of the Slave device
cE10	Communication time-out	Check if the wiring for the communication is correct
cP10	Keypad (KPV-CE01) communication time-out	<ol style="list-style-type: none"> <li>Check if the wiring for the communication is correct</li> <li>Check if there is any wrong with the keypad</li> </ol>
bF	Braking resistor fault	If the fault code is still displayed on the keypad after pressing "RESET" key, please return to the factory.
Ydc	Y-connection/ $\Delta$ -connection switch error	<ol style="list-style-type: none"> <li>Check the wiring of the Y-connection/<math>\Delta</math>-connection</li> <li>Check the parameters settings</li> </ol>

### 6.1.2 Reset

There are three methods to reset the AC motor drive after solving the fault:

- Press  key on KPV-CE01.
- Set external terminal to "RESET" (set one of Pr.02-01~Pr.02-06/ Pr.02-23~Pr.02-30 to 5) and then set to be ON.
- Send "RESET" command by communication.

#### NOTE

Make sure that RUN command or signal is OFF before executing RESET to prevent damage or personal injury due to immediate operation.