



Fault tracing

What this chapter contains

- *Safety*
- *Indications*
- *Warning/fault history*
- *QR Code generation for mobile service application*
- *Warning messages*
- *Fault messages*

If the warnings and faults cannot be identified and corrected using the information in this chapter, contact an ABB service representative. If you use the Drive composer PC tool, send the Support package created by the Drive composer to the ABB service representative.

Warnings and faults are listed in separate tables. Each table is sorted by a warning/fault code.

Safety



WARNING! Only qualified electricians are allowed to service the drive. Read the instructions in chapter *Safety instructions* at the beginning of the hardware manual of the drive before working on the drive.

Indications

■ Warnings and faults

Warnings and faults indicate an abnormal drive status. The codes and names of active warnings and faults are displayed on the control panel of the drive as well as in the Drive composer PC tool. Only the codes of warnings and faults are available over fieldbus.

Warnings do not need to be reset; they stop showing when the cause of the warning ceases. Warnings do not latch and the drive will continue to operate the motor.

Faults latch inside the drive and cause the drive to trip, and the motor stops. After the cause of a fault has been removed, the fault can be reset from parameter *31.11 Fault reset selection* (such as the control panel, Drive composer PC tool, the digital inputs of the drive, or fieldbus). Resetting the fault creates an event *64FF Fault reset*. After the reset, the drive can be restarted.

Note that some faults require a reboot of the control unit either by switching the power off and on, or using parameter *96.08 Control board boot* – this is mentioned in the fault listing wherever appropriate.

■ Pure events

In addition to warnings and faults, there are pure events that are only recorded in the event log of the drive. The codes of these events are included in the *Warning messages* table on page 346.

Warning/fault history

■ Event log

All indications are stored in the event log. The event log stores information on

- the last 8 fault recordings, that is, faults that tripped the drive or fault resets
- the last 10 warnings or pure events that occurred.

See section *Viewing warning/fault information* on page 345. The logs can be cleared using parameter *96.51 Clear fault and event logger*.

Auxiliary codes

Some events generate an auxiliary code that often helps in pinpointing the problem. On the control panel, the auxiliary code is stored as part of the details of the event; in the Drive composer PC tool, the auxiliary code is shown in the event listing.

■ Viewing warning/fault information

The drive is able to store a list of the active faults actually causing the drive to trip at the present time. The drive also stores a list of faults and warnings that have previously occurred.

For each stored fault, the panel shows the fault code, time and values of nine parameters (actual signals and status words) stored at the time of the fault. The values of the parameters for the latest fault are in parameters *05.80...05.88*.

For active faults and warnings, see

- **Main menu - Diagnostics - Active faults**
- **Main menu - Diagnostics - Active warnings**
- **Options menu - Active faults**
- **Options menu - Active warnings**
- parameters in group *04 Warnings and faults* (page 115).

For previously occurred faults and warnings, see

- **Main menu - Diagnostics - Fault & event log**
- **Note:** Active faults are also stored in the fault and event log.
- parameters in group *04 Warnings and faults* (page 115).

The event log can also be accessed (and reset) using the Drive composer PC tool. See *Drive composer PC tool user's manual* (3AUA0000094606 [English]).

QR Code generation for mobile service application

A QR Code (or a series of QR Codes) can be generated by the drive for display on the assistant control panel. The QR Code contains drive identification data, information on the latest events, and values of status and counter parameters. The code can be read with a mobile device containing the ABB service application, which then sends the data to ABB for analysis. For more information on the application, contact your local ABB service representative.

Warning messages

Note: The list also contains events that only appear in the Event log.

Code (hex)	Warning / Aux. code	Cause	What to do
64FF	Fault reset	A fault has been reset from the panel, Drive composer PC tool, fieldbus or I/O.	Event. Informative only.
A2A1	Current calibration	Current offset and gain measurement calibration will occur at next start.	Informative warning. (See parameter <i>99.13 ID run requested.</i>)
A2B1	Overcurrent	Output current has exceeded internal fault limit. In addition to an actual overcurrent situation, this warning may also be caused by an earth fault or supply phase loss.	<p>Check motor load.</p> <p>Check acceleration times in parameter group <i>23 Speed reference ramp</i> (speed control), <i>26 Torque reference chain</i> (torque control) or <i>28 Frequency reference chain</i> (frequency control). Also check parameters <i>46.01 Speed scaling</i>, <i>46.02 Frequency scaling</i> and <i>46.03 Torque scaling</i>.</p> <p>Check motor and motor cable (including phasing and delta/star connection).</p> <p>Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter <i>Electrical installation</i>, section <i>Checking the insulation of the assembly</i> in the hardware manual of the drive.</p> <p>Check there are no contactors opening and closing in motor cable.</p> <p>Check that the start-up data in parameter group <i>99 Motor data</i> corresponds to the motor rating plate.</p> <p>Check that there are no power factor correction capacitors or surge absorbers in motor cable.</p>
A2B3	Earth leakage	Drive has detected load unbalance typically due to earth fault in motor or motor cable.	<p>Check there are no power factor correction capacitors or surge absorbers in motor cable.</p> <p>Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter <i>Electrical installation</i>, section <i>Checking the insulation of the assembly</i> in the hardware manual of the drive. If an earth fault is found, fix or change the motor cable and/or motor.</p> <p>If no earth fault can be detected, contact your local ABB representative.</p>

Code (hex)	Warning / Aux. code	Cause	What to do
A2B4	Short circuit	Short-circuit in motor cable(s) or motor.	<p>Check motor and motor cable for cabling errors.</p> <p>Check motor and motor cable (including phasing and delta/star connection).</p> <p>Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable.</p> <p>See chapter <i>Electrical installation</i>, section <i>Checking the insulation of the assembly</i> in the hardware manual of the drive.</p> <p>Check there are no power factor correction capacitors or surge absorbers in motor cable.</p>
A2BA	IGBT overload	Excessive IGBT junction to case temperature. This warning protects the IGBT(s) and can be activated by a short circuit in the motor cable.	<p>Check motor cable.</p> <p>Check ambient conditions.</p> <p>Check air flow and fan operation.</p> <p>Check heatsink fins for dust pick-up.</p> <p>Check motor power against drive power.</p>
A3A1	DC link overvoltage	Intermediate circuit DC voltage too high (when the drive is stopped).	<p>Check the supply voltage setting (parameter <i>95.01 Supply voltage</i>). Note that the wrong setting of the parameter may cause the motor to rush uncontrollably, or may overload the brake chopper or resistor.</p> <p>Check the supply voltage.</p> <p>If the problem persists, contact your local ABB representative.</p>
A3A2	DC link undervoltage	Intermediate circuit DC voltage too low (when the drive is stopped).	
A3AA	DC not charged	The voltage of the intermediate DC circuit has not yet risen to operating level.	
A490	Incorrect temperature sensor setup	Sensor type mismatch.	Check the settings of temperature source parameters <i>35.11</i> .
A491	External temperature 1 (Editable message text)	Measured temperature 1 has exceeded warning limit.	<p>Check the value of parameter <i>35.02 Measured temperature 1</i>.</p> <p>Check the cooling of the motor (or other equipment whose temperature is being measured).</p> <p>Check the value of <i>35.13 Temperature 1 warning limit</i>.</p>
A4A1	IGBT overtemperature	Estimated drive IGBT temperature is excessive.	<p>Check ambient conditions.</p> <p>Check air flow and fan operation.</p> <p>Check heatsink fins for dust pick-up.</p> <p>Check motor power against drive power.</p>
A4A9	Cooling	Drive module temperature is excessive.	<p>Check ambient temperature. If it exceeds 50 °C /122 °F, ensure that load current does not exceed derated load capacity of drive. See chapter <i>Technical data</i>, section <i>Derating</i> in the hardware manual of the drive.</p> <p>Check drive module cooling air flow and fan operation.</p> <p>Check inside of cabinet and heatsink of drive module for dust pick-up. Clean whenever necessary.</p>

Code (hex)	Warning / Aux. code	Cause	What to do
A4B0	Excess temperature	Power unit module temperature is excessive.	Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
A4B1	Excess temperature difference	High temperature difference between the IGBTs of different phases.	Check the motor cabling. Check cooling of drive module(s).
A4F6	IGBT temperature	Drive IGBT temperature is excessive.	Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
A580	PU communication	Communication errors detected between the drive control unit and the power unit.	Check the connections between the drive control unit and the power unit.
A591	Drive HW initialization	Initialization of the drive hardware.	Check the auxiliary code. See actions for each code below.
	0000	Drive hardware setup is initializing.	Wait for the setup to initialize.
	0001	Initializing HW settings for the first time.	Wait for the setup to initialize.
A5A0	Safe torque off Programmable warning: 31.22 STO indication run/stop	Safe torque off function is active, ie safety circuit signal(s) connected to connector STO is lost.	Check safety circuit connections. For more information, see chapter <i>The Safe torque off function</i> in the hardware manual of the drive and description of parameter 31.22 STO indication run/stop (page 214).
A5EA	Measurement circuit temperature	Problem with internal temperature measurement of the drive.	Contact your local ABB representative.
A5EB	PU board powerfail	Power unit power supply failure.	Contact your local ABB representative.
A5EC	PU communication internal	Communication errors detected between the drive control unit and the power unit.	Check the connections between the drive control unit and the power unit.
A5ED	Measurement circuit ADC	Measurement circuit fault.	Contact your local ABB representative.
A5EE	Measurement circuit DFF	Measurement circuit fault.	Contact your local ABB representative.
A5EF	PU state feedback	State feedback from output phases does not match control signals.	Contact your local ABB representative.
A5F0	Charging feedback	Charging feedback signal missing.	Check the feedback signal coming from the charging system.
A686	Checksum mismatch Programmable warning: 96.54 Checksum action	The calculated parameter checksum does not match any enabled reference checksum.	Check that all necessary approved (reference) checksums (96.71...96.72) are enabled in 96.55 Checksum control word. Check the parameter configuration. Using 96.55 Checksum control word, enable a checksum parameter and copy the actual checksum into that parameter.

Code (hex)	Warning / Aux. code	Cause	What to do
A687	Checksum configuration	An action has been defined for a parameter checksum mismatch but the feature has not been configured.	Contact your local ABB representative for configuring the feature, or disable the feature in <i>96.54 Checksum action</i> .
A6A4	Motor nominal value	The motor parameters are set incorrectly.	Check the settings of the motor configuration parameters in group 99.
		The drive is not dimensioned correctly.	Check that the drive is sized correctly for the motor.
A6A5	No motor data	Parameters in group 99 have not been set.	Check that all the required parameters in group 99 have been set. Note: It is normal for this warning to appear during the start-up and continue until the motor data is entered.
A6A6	Voltage category unselected	The voltage category has not been defined.	Set voltage category in parameter <i>95.01 Supply voltage</i> .
A6B0	User lock is open	The user lock is open, ie. user lock configuration parameters <i>96.100...96.102</i> are visible.	Close the user lock by entering an invalid pass code in parameter <i>96.02 Pass code</i> . See section <i>User lock</i> (page 105).
A6B1	User pass code not confirmed	A new user pass code has been entered in parameter <i>96.100</i> but not confirmed in <i>96.101</i> .	Confirm the new pass code by entering the same code in <i>96.101</i> . To cancel, close the user lock without confirming the new code. See section <i>User lock</i> (page 105).
A6E5	AI parametrization	The current/voltage hardware setting of an analog input does not correspond to parameter settings.	Check the event log for an auxiliary code. The code identifies the analog input whose settings are in conflict. Adjust parameter <i>12.15/12.25</i> . Note: Control board reboot (either by cycling the power or through parameter <i>96.08 Control board boot</i>) is required to validate any changes in the hardware settings.
A6E6	ULC configuration	User load curve configuration error.	Check the auxiliary code. See actions for each code below.
	0000	Speed points inconsistent.	Check that each speed point (parameters <i>37.11...37.15</i>) has a higher value than the previous point.
	0001	Frequency points inconsistent.	Check that each frequency point (<i>37.16...37.20</i>) has a higher value than the previous point.
	0002	Underload point above overload point.	Check that each overload point (<i>37.31...37.35</i>) has a higher value than the corresponding underload point (<i>37.21...37.25</i>).
	0003	Overload point below underload point.	
A783	Motor overload	Motor current is too high.	Check the motor, and the machinery coupled to motor, for overload. Adjust the parameters used for the motor overload function (<i>35.51...35.53</i>) and <i>35.55...35.56</i> .

Code (hex)	Warning / Aux. code	Cause	What to do
A784	Motor disconnect	All three output phases are disconnected from motor.	Check if parameter <i>95.26</i> enables the use of a motor disconnect switch. If not, check the following: <ul style="list-style-type: none"> All switches between drive and motor are closed. All cables between drive and motor are connected and secured. If no issue was detected and drive output was actually connected to motor, contact ABB.
A780	Motor stall Programmable warning: <i>31.24 Stall function</i>	Motor is operating in stall region because of e.g. excessive load or insufficient motor power.	Check motor load and drive ratings. Check fault function parameters.
A791	Brake resistor	Brake resistor broken or not connected.	Check that a brake resistor has been connected. Check the condition of the brake resistor.
A793	BR excess temperature	Brake resistor temperature has exceeded warning limit defined by parameter <i>43.12 Brake resistor warning limit</i> .	Stop drive. Let resistor cool down. Check resistor overload protection function settings (parameter group <i>43 Brake chopper</i>). Check warning limit setting, parameter <i>43.12 Brake resistor warning limit</i> . Check that the resistor has been dimensioned correctly. Check that braking cycle meets allowed limits.
A794	BR data	Brake resistor data has not been given.	Check the resistor data settings (parameters <i>43.08...43.10</i>).
A79C	BC IGBT excess temperature	Brake chopper IGBT temperature has exceeded internal warning limit.	Let chopper cool down. Check for excessive ambient temperature. Check for cooling fan failure. Check for obstructions in the air flow. Check the dimensioning and cooling of the cabinet. Check resistor overload protection function settings (parameters <i>43.06...43.10</i>). Check minimum allowed resistor value for the chopper being used. Check that braking cycle meets allowed limits. Check that drive supply AC voltage is not excessive.
A7CE	EFB comm loss Programmable warning: <i>58.14 Communication loss action</i>	Communication break in embedded fieldbus (EFB) communication.	Check the status of the fieldbus master (online/offline/error etc.). Check cable connections to the EIA-485 terminals 25, 26, 27 and 28 on the control unit.

Code (hex)	Warning / Aux. code	Cause	What to do
A7EE	Panel loss Programmable warning: <i>49.05 Communication loss action</i>	Control panel or PC tool selected as active control location for drive has ceased communicating.	Check PC tool or control panel connection. Check control panel connector. Check mounting platform if being used. Disconnect and reconnect the control panel.
A7AC	Main IOMCU internal error	Calibration data is not stored in the main IOMCU. Analog signals are not working with full accuracy.	Contact ABB
A8A0	AI supervision Programmable warning: <i>12.03 AI supervision function</i>	An analog signal is outside the limits specified for the analog input.	Check signal level at the analog input. Check the wiring connected to the input. Check the minimum and maximum limits of the input in parameter group 12 <i>Standard AI</i> .
A8A1	RO life warning	The relay has changed states more than the recommended number of times.	Change the control board or stop using the relay output.
	0001	Relay output 1	Change the control board or stop using relay output 1.
A8A2	RO toggle warning	The relay output is changing states faster than recommended, eg. if a fast changing frequency signal is connected to it. The relay lifetime will be exceeded shortly.	Replace the signal connected to the relay output source with a less frequently changing signal.
	0001	Relay output 1	Select a different signal with parameter <i>10.24 RO1 source</i> .
A8B0	Signal supervision (Editable message text) Programmable warning: <i>32.06 Supervision 1 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.07 Supervision 1 signal</i>).
A8B1	Signal supervision (Editable message text) Programmable warning: <i>32.16 Supervision 2 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.17 Supervision 2 signal</i>).
A8B2	Signal supervision (Editable message text) Programmable warning: <i>32.26 Supervision 3 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.27 Supervision 3 signal</i>).

Code (hex)	Warning / Aux. code	Cause	What to do
A8B3	Signal supervision (Editable message text) Programmable warning: <i>32.36 Supervision 4 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.37 Supervision 4 signal</i>).
A8B4	Signal supervision (Editable message text) Programmable warning: <i>32.46 Supervision 5 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.47 Supervision 5 signal</i>).
A8B5	Signal supervision (Editable message text) Programmable warning: <i>32.56 Supervision 6 action</i>	Warning generated by a signal supervision function.	Check the source of the warning (parameter <i>32.57 Supervision 6 signal</i>).
A8C0	ULC invalid speed table	User load curve: X-axis points (speed) are not valid.	Check that points fulfill conditions. See parameter <i>37.11 ULC speed table point 1</i> .
A8C1	ULC overload warning	User load curve: Signal has been too long over the overload curve.	See parameter <i>37.03 ULC overload actions</i> .
A8C4	ULC underload warning	User load curve: Signal has been too long under the underload curve.	See parameter <i>37.04 ULC underload actions</i> .
A8C5	ULC invalid underload table	User load curve: Underload curve points are not valid.	Check that points fulfill conditions. See parameter <i>37.21 ULC underload point 1</i> .
A8C6	ULC invalid overload table	User load curve: Overload curve points are not valid.	Check that points fulfill conditions. See parameter <i>37.31 ULC overload point 1</i> .
A8C8	ULC invalid frequency table	User load curve: X-axis points (frequency) are not valid.	Check that points fulfill conditions. - $500.0 \text{ Hz} \leq 37.16 < 37.17 < 37.18 < 37.19 < 37.20 \leq 500.0 \text{ Hz}$. See parameter <i>37.16 ULC frequency table point 1</i> .
A981	External warning 1 (Editable message text) Programmable warning: <i>31.01 External event 1 source</i> <i>31.02 External event 1 type</i>	Fault in external device 1.	Check the external device. Check setting of parameter <i>31.01 External event 1 source</i> .

Code (hex)	Warning / Aux. code	Cause	What to do
A982	External warning 2 (Editable message text) Programmable warning: <i>31.03 External event 2 source</i> <i>31.04 External event 2 type</i>	Fault in external device 2.	Check the external device. Check setting of parameter <i>31.03 External event 2 source</i> .
A983	External warning 3 (Editable message text) Programmable warning: <i>31.05 External event 3 source</i> <i>31.06 External event 3 type</i>	Fault in external device 3.	Check the external device. Check setting of parameter <i>31.05 External event 3 source</i> .
A984	External warning 4 (Editable message text) Programmable warning: <i>31.07 External event 4 source</i> <i>31.08 External event 4 type</i>	Fault in external device 5.	Check the external device. Check setting of parameter <i>31.07 External event 4 source</i> .
A985	External warning 5 (Editable message text) Programmable warning: <i>31.09 External event 5 source</i> <i>31.10 External event 5 type</i>	Fault in external device 5.	Check the external device. Check setting of parameter <i>31.09 External event 5 source</i> .
AF8C	Process PID sleep mode	The drive is entering sleep mode.	Informative warning. See section <i>Sleep and boost functions for process PID control</i> , and parameters <i>40.43...40.48</i> .
AF90	Autotune	The autotune routine has been interrupted.	The code contains an auxiliary value that specifies the reason for the abortion. For details, see section <i>Speed controller autotune</i> .
AFAA	Autoreset	A fault is about to be autoreset.	Informative warning. See the settings in parameter group <i>31 Fault functions</i> .
AFE1	Emergency stop (off2)	Drive has received an emergency stop (mode selection off2) command.	Check that it is safe to continue operation. Then return emergency stop push button to normal position. Restart drive.
AFE2	Emergency stop (off1 or off3)	Drive has received an emergency stop (mode selection off1 or off3) command.	If the emergency stop was unintentional, check the source selected by parameter <i>21.05 Emergency stop source</i> .

Code (hex)	Warning / Aux. code	Cause	What to do
AFEA	Enable start signal missing (Editable message text)	No enable start signal received.	Check the setting of (and the source selected by) parameter 20.19 <i>Enable start command</i> .
AFE9	Start delay	The start delay is active and the drive will start the motor after a predefined delay.	Informative warning. See parameter 21.22 <i>Start delay</i> .
AFEB	Run enable missing	No run enable signal is received.	Check setting of parameter 20.12 <i>Run enable 1 source</i> . Switch signal on (e.g. in the fieldbus Control Word) or check wiring of selected source.
AFED	Enable to rotate	Signal enable to rotate has not been received within a fixed time delay of 240s.	Switch enable to rotate signal on (eg. in digital inputs). Check the setting of (and source selected by) parameter 20.22 <i>Enable to rotate</i> .
AFF6	Identification run	Motor ID run will occur at next start.	Informative warning.
AFF7	Autophasing	Autophasing will occur at next start.	Informative warning.
B5A0	STO event Programmable event: 31.22 <i>STO indication run/stop</i>	Safe torque off function is active, ie. safety circuit signal(s) connected to connector STO is lost.	Check safety circuit connections. For more information, see chapter <i>The Safe torque off function</i> in the hardware manual of the drive and description of parameter 31.22 <i>STO indication run/stop</i> (page 214).
B686	Checksum mismatch Programmable event: 96.54 <i>Checksum action</i>	The calculated parameter checksum does not match any enabled reference checksum.	See A686 <i>Checksum mismatch</i> (page 348).

Fault messages

Code (hex)	Fault / Aux. code	Cause	What to do
1080	Backup/Restore timeout	Panel or PC tool has failed to communicate with the drive when backup was being made or restored.	Request backup or restore again.
1081	Rating ID fault	Drive software has not been able to read the rating ID of the drive.	Reset the fault to make the drive try to reread the rating ID. If the fault reappears, cycle the power to the drive. You may have to repeat this. If the fault persists, contact your local ABB representative.
2281	Calibration	Measured offset of output phase current measurement or difference between output phase U2 and W2 current measurement is too great (the values are updated during current calibration).	Try performing the current calibration again. If the fault persists, contact your local ABB representative.
2310	Overcurrent	Output current has exceeded internal fault limit. In addition to an actual overcurrent situation, this fault may also be caused by an earth fault or supply phase loss.	Check motor load. Check acceleration times in parameter group <i>23 Speed reference ramp</i> (speed control), <i>26 Torque reference chain</i> (torque control) or <i>28 Frequency reference chain</i> (frequency control). Also check parameters <i>46.01 Speed scaling</i> , <i>46.02 Frequency scaling</i> and <i>46.03 Torque scaling</i> . Check motor and motor cable (including phasing and delta/star connection). Check there are no contactors opening and closing in motor cable. Check that the start-up data in parameter group <i>99 Motor data</i> corresponds to the motor rating plate. Check that there are no power factor correction capacitors or surge absorbers in motor cable. Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. See chapter <i>Electrical installation</i> , section <i>Checking the insulation of the assembly</i> in the hardware manual of the drive.
2330	Earth leakage Programmable fault: <i>30.20 Earth fault</i>	Drive has detected load unbalance typically due to earth fault in motor or motor cable.	Check there are no power factor correction capacitors or surge absorbers in motor cable. Check for an earth fault in motor or motor cables by measuring the insulation resistances of motor and motor cable. Try running the motor in scalar control mode if allowed. (See parameter <i>99.04 Motor control mode</i> .) If no earth fault can be detected, contact your local ABB representative.

Code (hex)	Fault / Aux. code	Cause	What to do
2340	Short circuit	Short-circuit in motor cable(s) or motor. Aux code 0x0080 indicates that the state feedback from output phases does not match the control signals.	Check motor and motor cable for cabling errors. Check there are no power factor correction capacitors or surge absorbers in motor cable. Cycle the power to the drive.
2381	IGBT overload	Excessive IGBT junction to case temperature. This fault protects the IGBT(s) and can be activated by a short circuit in the motor cable.	Check motor cable. Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
3130	Input phase loss	Intermediate circuit DC voltage is oscillating due to missing input power line phase or blown fuse.	Check input power line fuses. Check for loose power cable connections. Check for input power supply imbalance.
3181	Cross connection Programmable fault: <i>31.23 Wiring or earth fault</i>	Incorrect input power and motor cable connection (ie. input power cable is connected to drive motor connection).	Check input power connections.
3210	DC link overvoltage	Excessive intermediate circuit DC voltage.	Check that overvoltage control is on (parameter <i>30.30 Overvoltage control</i>). Check that the supply voltage matches the nominal input voltage of the drive. Check the supply line for static or transient overvoltage. Check deceleration time. Use coast-to-stop function (if applicable). Retrofit drive with brake chopper and brake resistor. Check that the brake resistor is dimensioned properly and the resistance is between acceptable range for the drive.
3220	DC link undervoltage	Intermediate circuit DC voltage is not sufficient because of a missing supply phase, blown fuse or fault in the rectifier bridge.	Check supply cabling, fuses and switchgear.
3385	Autophasing	Autophasing routine (see section <i>Autophasing</i> on page 65) has failed.	Check that the motor ID run has been successfully completed. Check that the motor is not already turning when the autophasing routine starts. Check the setting of parameter <i>99.03 Motor type</i> .
3381	Output phase loss Programmable fault: <i>31.19 Motor phase loss</i>	Motor circuit fault due to missing motor connection (any of the three phases not connected). In scalar control mode, the drive detects fault only when the output frequency is above 10% of the motor nominal frequency.	Connect motor cable. If the drive is in scalar mode and nominal current of the motor is less than 1/6 of the nominal output current of the drive, set parameter <i>31.19 Motor phase loss</i> to <i>No action</i> .

Code (hex)	Fault / Aux. code	Cause	What to do
4110	Control board temperature	Control board temperature is too high.	Check proper cooling of the drive. Check the auxiliary cooling fan.
4210	IGBT overtemperature	Estimated drive IGBT temperature is excessive.	Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
4290	Cooling	Drive module temperature is excessive.	Check ambient temperature. If it exceeds 50 °C /122 °F, ensure that load current does not exceed derated load capacity of drive. See chapter <i>Technical data</i> , section <i>Derating</i> in the hardware manual of the drive. Check drive module cooling air flow and fan operation. Check inside of cabinet and heatsink of drive module for dust pick-up. Clean whenever necessary.
42F1	IGBT temperature	Drive IGBT temperature is excessive.	Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
4310	Excess temperature	Power unit module temperature is excessive.	Check ambient conditions. Check air flow and fan operation. Check heatsink fins for dust pick-up. Check motor power against drive power.
4180	Excess temperature difference	High temperature difference between the IGBTs of different phases.	Check the motor cabling. Check cooling of drive module(s).
4981	External temperature 1 (Editable message text)	Measured temperature 1 has exceeded fault limit.	Check the value of parameter <i>35.02 Measured temperature 1</i> . Check the cooling of the motor (or other equipment whose temperature is being measured). Check the value of parameter <i>35.12 Temperature 1 fault limit</i> .
5090	STO hardware failure	STO hardware diagnostics has detected hardware failure.	Contact your local ABB representative for hardware replacement.
5091	Safe torque off Programmable fault: <i>31.22 STO indication run/stop</i>	Safe torque off function is active, ie. safety circuit signal(s) connected to connector STO is broken during start or run.	Check safety circuit connections. For more information, see chapter <i>The Safe torque off function</i> in the hardware manual of the drive and description of parameter <i>31.22 STO indication run/stop</i> (page 214).
5092	PU logic error	Power unit memory has cleared.	Contact your local ABB representative.
5093	Rating ID mismatch	The hardware of the drive does not match the information stored in the memory. This may occur eg. after a firmware update.	Cycle the power to the drive. You may have to repeat this.
5094	Measurement circuit temperature	Problem with internal temperature measurement of the drive.	Contact your local ABB representative.

Code (hex)	Fault / Aux. code	Cause	What to do
5098	I/O communication loss	Communication failure to standard I/O.	Try resetting the fault or cycle the power to the drive.
50A0	Fan	Cooling fan stuck or disconnected.	Check fan operation and connection. Replace fan if faulty.
5681	PU communication	Communication errors detected between the drive control unit and the power unit.	Check the connection between the drive control unit and the power unit.
5682	Power unit lost	Connection between the drive control unit and the power unit is lost.	Check the connection between the control unit and the power unit.
5690	PU communication internal	Internal communication error.	Contact your local ABB representative.
5691	Measurement circuit ADC	Measurement circuit fault.	Contact your local ABB representative.
5692	PU board powerfail	Power unit power supply failure.	Contact your local ABB representative.
5693	Measurement circuit DFF	Measurement circuit fault.	Contact your local ABB representative.
5696	PU state feedback	State feedback from output phases does not match control signals.	Contact your local ABB representative.
5697	Charging feedback	Charging feedback signal missing.	Check the feedback signal coming from the charging system.
6181	FPGA version incompatible	Firmware and FPGA versions are incompatible.	Reboot the control unit (using parameter <i>96.08 Control board boot</i>) or by cycling power. If the problem persists, contact your local ABB representative
6200	Checksum mismatch Programmable event: <i>96.54 Checksum action</i>	The calculated parameter checksum does not match any enabled reference checksum.	See <i>A686 Checksum mismatch</i> (page 348).
6481	Task overload	Internal fault.	Reboot the control unit (using parameter <i>96.08 Control board boot</i>) or by cycling power. If the problem persists, contact your local ABB representative
6487	Stack overflow	Internal fault.	Reboot the control unit (using parameter <i>96.08 Control board boot</i>) or by cycling power. If the problem persists, contact your local ABB representative
64A1	Internal file load	File read error.	Reboot the control unit (using parameter <i>96.08 Control board boot</i>) or by cycling power. If the problem persists, contact your local ABB representative
64A6	Adaptive program file incompatible or corrupted	Adaptive program has faulted.	Check the auxiliary code. See actions for each code below.
	000A	Program corrupted or block non-existent.	Restore the template program or download the program to the drive.
	000C	Required block input missing.	Check the inputs of the block.
	000E	Program corrupted or block non-existent.	Restore the template program or download the program to the drive.

Code (hex)	Fault / Aux. code	Cause	What to do
	0011	Program too large.	Remove blocks until the error stops.
	0012	Program is empty.	Correct the program and download it to the drive.
	001C	A non-existing parameter or block is used in the parameter.	Edit the program to correct the parameter reference, or use an existing block.
	001E	Output to parameter failed because the parameter was write-protected.	Check the parameter reference in the program. Check for other sources affecting the target parameter.
	0023	Program file incompatible with current firmware version.	Adapt the program to current block library and firmware version.
	0024	Program file incompatible with current firmware version.	Adapt the program to current block library and firmware version.
	Other	-	Contact your local ABB representative, quoting the auxiliary code.
64B2	User set fault	Loading of user parameter set failed because <ul style="list-style-type: none"> • requested set does not exist • set is not compatible with control program • drive was switched off during loading. 	Ensure that a valid user parameter set exists. Reload if uncertain.
64E1	Kernel overload	Operating system error.	Reboot the control unit (using parameter <i>96.08 Control board boot</i>) or by cycling power. If the problem persists, contact your local ABB representative
6581	Parameter system	Parameter load or save failed.	Try forcing a save using parameter <i>96.07 Parameter save manually</i> . Retry.
6681	EFB comm loss Programmable fault: <i>58.14 Communication loss action</i>	Communication break in embedded fieldbus (EFB) communication.	Check the status of the fieldbus master (online/offline/error etc.). Check cable connections to the EIA-485 terminals 25, 26, 27 and 28 on the control unit.
6682	EFB config file	Embedded fieldbus (EFB) configuration file could not be read.	Contact your local ABB representative.
6683	EFB invalid parameterization	Embedded fieldbus (EFB) parameter settings inconsistent or not compatible with selected protocol.	Check the settings in parameter group <i>58 Embedded fieldbus</i> .
6684	EFB load fault	Embedded fieldbus (EFB) protocol firmware could not be loaded. Version mismatch between EFB protocol firmware and drive firmware.	Contact your local ABB representative.
6685	EFB fault 2	Fault reserved for the EFB protocol application.	Check the documentation of the protocol.
6686	EFB fault 3	Fault reserved for the EFB protocol application.	Check the documentation of the protocol.

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Code (hex)	Fault / Aux. code	Cause	What to do
6882	Text 32-bit table overflow	Internal fault.	Reset the fault. Contact your local ABB representative if the fault persists.
6885	Text file overflow	Internal fault.	Reset the fault. Contact your local ABB representative if the fault persists.
7081	Control panel loss Programmable fault: <i>49.05 Communication loss action</i>	Control panel or PC tool selected as active control location for drive has ceased communicating.	Check PC tool or control panel connection. Check control panel connector. Disconnect and reconnect the control panel.
7082	I/O module comm loss	Communication between IO module and drive is not working properly.	Replace the drive.
7086	I/O module AI Over voltage	Overvoltage detected in AI. AI is changed to voltage mode. AI will return automatically back to mA mode when the AI signal level is in accepted limits.	Check AI signal levels.
7121	Motor stall Programmable fault: <i>31.24 Stall function</i>	Motor is operating in stall region because of e.g. excessive load or insufficient motor power.	Check motor load and drive ratings. Check fault function parameters.
7122	Motor overload	Motor current is too high.	Check the motor, and the machinery coupled to motor, for overload. Adjust the parameters used for the motor overload function (<i>35.51...35.53</i>) and <i>35.55...35.56</i> .
7183	BR excess temperature	Brake resistor temperature has exceeded fault limit defined by parameter <i>43.11 Brake resistor fault limit</i> .	Stop drive. Let resistor cool down. Check resistor overload protection function settings (parameter group <i>43 Brake chopper</i>). Check fault limit setting, parameter <i>43.11 Brake resistor fault limit</i> . Check that braking cycle meets allowed limits.
7310	Overspeed	Motor is turning faster than highest allowed speed due to incorrectly set minimum/maximum speed, insufficient braking torque or changes in load when using torque reference.	Check minimum/maximum speed settings, parameters <i>30.11 Minimum speed</i> and <i>30.12 Maximum speed</i> . Check adequacy of motor braking torque. Check applicability of torque control. Check need for brake chopper and resistor(s).
73F0	Overfrequency	Maximum allowed output frequency exceeded.	Check minimum/maximum frequency settings, parameters <i>30.13 Minimum frequency</i> and <i>30.14 Maximum frequency</i> . Check adequacy of motor braking torque. Check applicability of torque control. Check need for brake chopper and resistor(s).

Code (hex)	Fault / Aux. code	Cause	What to do
	00FA	Motor is turning faster than the highest allowed frequency due to incorrectly set minimum/maximum frequency or the motor rushes because of too high supply voltage or incorrect supply voltage selection in parameter <i>95.01 Supply voltage</i> .	Check minimum/maximum frequency settings, parameters <i>30.13 Minimum frequency</i> and <i>30.14 Maximum frequency</i> . Check used supply voltage and voltage selection parameter <i>95.01 Supply voltage</i> .
	Other	-	Contact your local ABB representative, quoting the auxiliary code.
73B0	Emergency ramp failed	Emergency stop did not finish within expected time.	Check the settings of parameters <i>31.32 Emergency ramp supervision</i> and <i>31.33 Emergency ramp supervision delay</i> . Check the predefined ramp times (<i>23.11...23.15</i> for mode Off1, <i>23.23</i> for mode Off3).
8001	ULC underload fault	User load curve: Signal has been too long under the underload curve.	See parameter <i>37.04 ULC underload actions</i> .
8002	ULC overload fault	User load curve: Signal has been too long over the overload curve.	See parameter <i>37.03 ULC overload actions</i> .
80A0	AI supervision Programmable fault: <i>12.03 AI supervision function</i>	An analog signal is outside the limits specified for the analog input.	Check signal level at the analog input. Check the wiring connected to the input. Check the minimum and maximum limits of the input in parameter group <i>12 Standard AI</i> .
80B0	Signal supervision (Editable message text) Programmable fault: <i>32.06 Supervision 1 action</i>	Fault generated by the signal supervision 1 function.	Check the source of the fault (parameter <i>32.07 Supervision 1 signal</i>).
80B1	Signal supervision (Editable message text) Programmable fault: <i>32.16 Supervision 2 action</i>	Fault generated by the signal supervision 2 function.	Check the source of the fault (parameter <i>32.17 Supervision 2 signal</i>).
80B2	Signal supervision (Editable message text) Programmable fault: <i>32.26 Supervision 3 action</i>	Fault generated by the signal supervision 3 function.	Check the source of the fault (parameter <i>32.27 Supervision 3 signal</i>).
80B3	Signal supervision (Editable message text) Programmable fault: <i>32.36 Supervision 4 action</i>	Fault generated by the signal supervision 4 function.	Check the source of the fault (parameter <i>32.37 Supervision 4 signal</i>).

Code (hex)	Fault / Aux. code	Cause	What to do
80B4	Signal supervision (Editable message text) Programmable fault: <i>32.46 Supervision 5 action</i>	Fault generated by the signal supervision 5 function.	Check the source of the fault (parameter <i>32.47 Supervision 5 signal</i>).
80B5	Signal supervision (Editable message text) Programmable fault: <i>32.56 Supervision 6 action</i>	Fault generated by the signal supervision 6 function.	Check the source of the fault (parameter <i>32.57 Supervision 6 signal</i>).
9081	External fault 1 (Editable message text) Programmable fault: <i>31.01 External event 1 source</i> <i>31.02 External event 1 type</i>	Fault in external device 1.	Check the external device. Check setting of parameter <i>31.01 External event 1 source</i> .
9082	External fault 2 (Editable message text) Programmable fault: <i>31.03 External event 2 source</i> <i>31.04 External event 2 type</i>	Fault in external device 2.	Check the external device. Check setting of parameter <i>31.03 External event 2 source</i> .
9083	External fault 3 (Editable message text) Programmable fault: <i>31.05 External event 3 source</i> <i>31.06 External event 3 type</i>	Fault in external device 3.	Check the external device. Check setting of parameter <i>31.05 External event 3 source</i> .
9084	External fault 4 (Editable message text) Programmable fault: <i>31.07 External event 4 source</i> <i>31.08 External event 4 type</i>	Fault in external device 5.	Check the external device. Check setting of parameter <i>31.07 External event 4 source</i> .
9085	External fault 5 (Editable message text) Programmable fault: <i>31.09 External event 5 source</i> <i>31.10 External event 5 type</i>	Fault in external device 5.	Check the external device. Check setting of parameter <i>31.09 External event 5 source</i> .

Code (hex)	Fault / Aux. code	Cause	What to do
FA81	Safe torque off 1	Safe torque off function is active, ie. STO circuit 1 is broken.	Check safety circuit connections. For more information, see chapter <i>The Safe torque off function</i> in the hardware manual of the drive and description of parameter 31.22 <i>STO indication run/stop</i> (page 214).
FA82	Safe torque off 2	Safe torque off function is active, ie. STO circuit 2 is broken.	
FF61	ID run	Motor ID run was not completed successfully.	Check the nominal motor values in parameter group 99 <i>Motor data</i> . Check that no external control system is connected to the drive. Cycle the power to the drive (and its control unit, if powered separately). Check that no operation limits prevent the completion of the ID run. Restore parameters to default settings and try again. Check that the motor shaft is not locked.
	0001	Maximum current limit too low.	Check settings of parameters 99.06 <i>Motor nominal current</i> and 30.17 <i>Maximum current</i> . Make sure that $30.17 > 99.06$. Check that the drive is dimensioned correctly according to the motor.
	0002	Maximum speed limit or calculated field weakening point too low.	Check settings of parameters <ul style="list-style-type: none"> • 30.11 <i>Minimum speed</i> • 30.12 <i>Maximum speed</i> • 99.07 <i>Motor nominal voltage</i> • 99.08 <i>Motor nominal frequency</i> • 99.09 <i>Motor nominal speed</i>. Make sure that <ul style="list-style-type: none"> • $30.12 > (0.55 \times 99.09) > (0.50 \times \text{synchronous speed})$ • $30.11 \leq 0$, and • supply voltage $\geq (0.66 \times 99.07)$.
	0003	Maximum torque limit too low.	Check settings of parameter 99.12 <i>Motor nominal torque</i> , and the torque limits in group 30 <i>Limits</i> . Make sure that the maximum torque limit in force is greater than 100%.
	0004	Current measurement calibration did not finish within reasonable time	Contact your local ABB representative.
	0005...0008	Internal error.	Contact your local ABB representative.
	0009	(Asynchronous motors only) Acceleration did not finish within reasonable time.	Contact your local ABB representative.
	000A	(Asynchronous motors only) Deceleration did not finish within reasonable time.	Contact your local ABB representative.
	000B	(Asynchronous motors only) Speed dropped to zero during ID run.	Contact your local ABB representative.

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Code (hex)	Fault / Aux. code	Cause	What to do
	000C	(Permanent magnet motors only) First acceleration did not finish within reasonable time.	Contact your local ABB representative.
	000D	(Permanent magnet motors only) Second acceleration did not finish within reasonable time.	Contact your local ABB representative.
	000E...0010	Internal error.	Contact your local ABB representative.
	0011	(Synchronous reluctance motors only) Pulse test error.	Contact your local ABB representative.
	0013	(Asynchronous motors only) Motor data error.	Check that the motor nominal value settings in the drive are the same as in the motor nameplate. Contact your local ABB representative.
FF8E	EFB force trip	A fault trip command has been received through the embedded fieldbus interface.	Check the fault information provided by the PLC.