


5 Faults and Alarms

5.1 Fault messages

In the event of a failure, the inverter switches off and a fault code appears on the display.

NOTE

To reset the fault code, one of three methods listed below can be used:

1. Cycle the power to the drive.
 2. Press the  button on the BOP or AOP.
 3. Via Digital Input 3 (default setting)
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Fault messages are stored in parameter r0947 under their code number (e.g. F0003 = 3). The associated error value is found in parameter r0949. The value 0 is entered if a fault has no error value. It is furthermore possible to read out the point in time that a fault occurred (r0948) and the number of fault messages (P0952) stored in Parameter r0947.

F0001 OverCurrent STOP II

Quit

- Remove fault and reset fault memory by disconnecting the
- drive converter from the line supply and powering-up again
 - Press the Fn key on the BOP or AOP
 - Acknowledge fault P2103, P2104
 - P0952 (complete fault memory)

Cause

- Short circuit at the output
- Earth faults
- Excessively large motor
- Defective end stage

Diagnosis & Remedy

Check the following:

- Cable length limits must not be exceeded.
- Motor cable and motor must have no short-circuits or earth faults
- Motor parameters must match the motor in use
- Value of stator resistance (P0350) must be correct
- Motor must not be obstructed or overloaded
- Increase the ramp time
- Reduce the boost level
- Connect a smaller motor (lower rating)

F0002 OverVoltage STOP II

Quit

Refer to F0001

Cause

- DC-link voltage (r0026) exceeds the overvoltage threshold (refer to parameter r0026)
 - Ground fault
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NOTE

Overvoltage can be caused either by too high main supply voltage or if motor is in regenerative mode. Regenerative mode can be caused by fast ramp downs or if the motor is driven from an active load.

Diagnosis & Remedy

Check the following:

- Supply voltage (P0210) must lie within limits indicated on rating plate .
- DC-link voltage controller must be enabled (P1240) and parameterized properly.
- Extend the deceleration ramps (ramp-down time P1121, P1135)
- Remove the ground fault
- Required braking power must lie within specified limits.
- Check the feeder cable to the braking resistor
- Check the technical data of the braking resistor
- Check the load duty cycle of the braking resistor with reference to the application

NOTE

Higher inertia requires longer ramp times; otherwise, apply braking resistor.

F0003 UnderVoltage STOP II

Quit

Refer to F0001

Cause

- Main supply failed.
- Shock load outside specified limits.

Diagnosis & Remedy

Check the following:

- Supply voltage (P0210) must lie within limits indicated on rating plate.
- Supply must not be susceptible to temporary failures or voltage reductions.

F0004 Inverter Over Temperature STOP II

Quit

Refer to F0001

Cause

- Ventilation inadequate
- Ambient temperature is too high.
- Actual drive converter temperature r0037 exceeds the overtemperature threshold (refer to P0292)

Diagnosis & Remedy

Check the following:

- Fan must turn when inverter is running
- Pulse frequency must be set to default value
- Ambient temperature could be higher than specified for the inverter
- Reduce the load and / or ensure adequate cooling

Additional meaning for frame sizes FX and GX:

- P949 = 1: Rectifier overtemperature
- P949 = 2: Ambient overtemperature
- P949 = 3: EBOX overtemperature

F0005 Inverter I2T STOP II

Quit

Refer to F0001

Cause

- Inverter overloaded.
- Duty cycle too demanding.
- Motor power (P0307) exceeds inverter power capability (r0206).
- 100 % overload reached (refer to utilization r0036)

Diagnosis & Remedy

Check the following:

- Load duty cycle must lie within specified limits.
- Motor power (P0307) must match inverter power (r0206)

F0011 Motor Over Temperature STOP II

Quit

Refer to F0001

Cause

Motor overloaded

Diagnosis & Remedy

Check the following:

- Load duty cycle must be correct
- Motor nominal overtemperatures (P0626-P0628) must be correct
- Motor temperature warning level (P0604) must match
- Voltage boost (increase) too high and / or frequency setpoint too low ?
- Adapt the motor cooling to the application

F0012	Inverter temp. signal lost	STOP I
	<p>Quit Refer to F0001</p> <p>Cause Wire breakage of inverter temperature (heatsink) sensor</p>	
F0015	Motor temperature signal lost	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Open or short circuit of motor temperature sensor. If signal loss is detected, temperature monitoring switches over to monitoring with the motor thermal model.</p>	
F0020	Mains Phase Missing	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Fault occurs if one of the three input phases are missed and the pulses are enabled and drive is loaded</p> <p>Diagnosis & Remedy check the input wiring of the mains phases</p>	
F0021	Earth fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Fault occurs if the sum of the phase currents is higher than 5 % of the nominal inverter current.</p> <hr/> <p>NOTE This fault only occurs on inverters that have 3 current sensors. Framesizes D to F</p> <hr/>	
F0022	HW monitoring active	STOP II
	<p>Quit Refer to F0001</p> <p>Cause That hardware fault (P0947 = 22 and P0949 = 1) caused by the following events: (1) DC-link overcurrent = short circuit of IGBT (2) Short circuit of chopper (3) Earth fault (4) I/O board is not properly inserted. - Framesizes A to C (1),(2),(3),(4) - Framesizes D to E (1),(2),(4) - Framesize F (2),(4)</p> <p>Since all these faults are assigned to one signal on the power stack, it is not possible to establish which one actually occurred. The following faults (UCE and I2C) occur for frame size FX / GX only: - UCE failure was detected, when P0947 = 22 and fault value P0949 = 12 or 13 or 14, depending on UCE. - I2C bus read out error, when P0947 = 22 and fault value P0949 = 21 (the power has to be switched off/on).</p> <p>Diagnosis & Remedy First you must see if the fault is permanent (i.e. the inverter cannot be started without the fault occurring) or sporadic (occurs occasionally or in certain defined operating conditions). Permanent F0022 fault: - Check the I/O board. It has to be fully pressed home. - Is there an earth fault or short circuit on the output of the inverter or in an IGBT? Disconnecting the motor cables will establish which of these. In the case where the fault occurs permanently when all external wiring (apart from mains) is disconnected, then the unit almost certainly has a defect and should be repaired. Sporadic F0022 fault: This should be treated as "overcurrent". The following may cause the sporadic occurrence of F0022: - Sudden load changes or mechanical blockages. - Very short ramp times. - If the Sensorless Vector Control is badly optimized. - If an incorrect braking resistor of too low a resistance is fitted.</p>	

F0023	Output fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause One phase of output is disconnected</p>	
F0024	Rectifier Over Temperature	STOP II
	<p>Quit Refer to F0001</p> <p>Cause</p> <ul style="list-style-type: none"> - Ventilation inadequate - Fan inoperative - Ambient temperature is too high. <p>Diagnosis & Remedy Check the following:</p> <ul style="list-style-type: none"> - Fan must turn when inverter is running - Pulse frequency must be set to default value - Ambient temperature could be higher than specified for the inverter 	
F0030	Fan has failed	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Fan no longer working</p> <p>Diagnosis & Remedy</p> <ul style="list-style-type: none"> - Fault cannot be masked while options module (AOP or BOP) is connected. - Need a new fan. 	
F0035	Auto restart after n	STOP II
	<p>Quit reset fault memory or Power On / Stop</p> <p>Cause Auto restart attempts exceed value of P1211.</p>	
F0040	Automatic Calibration Failure	STOP II
	<p>Quit Refer to F0001</p> <p>Cause A calibration error occurred when automatically calibrating the analog inputs / outputs or the current actual value sensing. In the factory, the calibration is only carried-out once. This means that fault F0040 is only to be expected during the production process of the drive converter and not while the converter is being used.</p> <p>Diagnostics and removing faults Replace the drive</p>	
F0041	Motor Data Identification Failure	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Motor data identification failed.</p> <p>Alarm value = 0: Load missing</p> <p>Alarm value = 1: Current limit level reached during identification.</p> <p>Alarm value = 2: Identified stator resistance less than 0.1% or greater than 100%.</p> <p>Alarm value = 3: Identified rotor resistance less than 0.1% or greater than 100%.</p> <p>Alarm value = 4: Identified stator reactance less than 50% and greater than 500%</p> <p>Alarm value = 5: Identified main reactance less than 50% and greater than 500%</p> <p>Alarm value = 6: Identified rotor time constant less than 10ms or greater than 5s</p> <p>Alarm value = 7: Identified total leakage reactance less than 5% and greater than 50%</p> <p>Alarm value = 8: Identified stator leakage reactance less than 25% and greater than 250%</p> <p>Alarm value = 9: Identified rotor leakage inductance less than 25% and greater than 250%</p> <p>Alarm value = 20: Identified IGBT on-voltage less than 0.5 or greater than 10V</p> <p>Alarm value = 30: Current controller at voltage limit</p> <p>Alarm value = 40: Inconsistence of identified data set, at least one identification failed</p> <p>Percentage values based on the impedance $Z_b = V_{mot,nom} / \sqrt{3} / I_{mot,nom}$</p>	

Diagnosis & Remedy

Check the following:

- 0: Check that the motor is connected to the inverter.
- 1-40: Check if motor data in P0304 P0311 are correct.
- Check what type of motor wiring is required (star, delta).

F0042 Speed Control Optimisation Failure STOP II**Quit**

Refer to F0001

Cause

- Motor data identification failed.
- Alarm value = 0: Time out waiting for stable speed
- Alarm value = 1: Inconsistent readings

F0051 Parameter EEPROM Fault STOP II**Quit**

Refer to F0001

Cause

Read or write failure while saving non-volatile parameter.

Diagnosis & Remedy

- Factory Reset and new parameterization
- Change drive

F0052 power stack Fault STOP II**Quit**

Refer to F0001

Cause

Read failure for power stack information or invalid data.

Diagnosis & Remedy

Change drive

F0053 IO Eeprom Fault STOP II**Quit**

Refer to F0001

Cause

Read failure for IO EEPROM information or invalid data.

Diagnosis & Remedy

- Check data
- Change IO module

F0054 Wrong IO Board STOP II**Quit**

Refer to F0001

Cause

- Wrong IO board is connected.
- No ID detected on IO board, No data.

Diagnosis & Remedy

- Check data
- Change IO module

F0060 Asic Timeout STOP II**Quit**

Refer to F0001

Cause

Internal communications failure

Diagnosis & Remedy

- If fault persists, change inverter
- Contact Service Department

F0070	CB setpoint fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause No setpoint values from CB (communication board) during telegram off time</p> <p>Diagnosis & Remedy Check CB and communication partner</p>	
F0071	USS (BOP-link) setpoint fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause No setpoint values from USS during telegram off time</p> <p>Diagnosis & Remedy Check USS master</p>	
F0072	USS (COMM link) setpoint fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause No setpoint values from USS during telegram off time</p> <p>Diagnosis & Remedy Check USS master</p>	
F0080	ADC lost input signal	STOP II
	<p>Quit Refer to F0001</p> <p>Cause</p> <ul style="list-style-type: none"> - Broken wire - Signal out of limits 	
F0085	External Fault	STOP II
	<p>Quit Refer to F0001</p> <p>Cause External fault triggered via terminal inputs</p> <p>Diagnosis & Remedy Disable terminal input for fault trigger.</p>	
F0090	Encoder feedback loss	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Signal from Encoder lost (check alarm value r0949):</p> <p>Diagnosis & Remedy</p> <ul style="list-style-type: none"> - Alarm value = 0: Encoder signal lost. - Alarm value = 5: Encoder not configured in P0400, but required for sensed control (P1300 = 21 or 23). - Alarm value = 6: Encoder module not found, but configured in P0400. - Check connections between encoder and inverter. Check that encoder not faulty (select P1300 = 0, run at fixed speed, check encoder feedback signal in r0061) - Increase encoder loss threshold in P0492 	
F0101	Stack Overflow	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Software error or processor failure</p> <p>Diagnosis & Remedy Run self test routines</p>	

F0221	PID Feedback below min. value	STOP II
	<p>Quit Refer to F0001</p> <p>Cause PID Feedback below min. value P2268.</p> <p>Diagnosis & Remedy</p> <ul style="list-style-type: none"> - Change value of P2268. - Adjust feedback gain. 	
F0222	PID Feedback above max. value	STOP II
	<p>Quit Refer to F0001</p> <p>Cause PID feedback above max. value P2267.</p> <p>Diagnosis & Remedy</p> <ul style="list-style-type: none"> - Change value of P2267. - Adjust feedback gain. 	
F0450	BIST Tests Failure	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Fault value:</p> <ol style="list-style-type: none"> 1. Some power section tests have failed 2. Some control board tests have failed 4. Some functional tests have failed 8. Some IO module tests have failed. (MM 420 only) 16. Internal RAM failed on power-up check <p>Diagnosis & Remedy Drive may run but some features will not work properly. Replace drive.</p>	
F0452	Belt Failure Detected	STOP II
	<p>Quit Refer to F0001</p> <p>Cause Load conditions on motor indicate belt failure or mechanical fault.</p> <p>Diagnosis & Remedy Check the following:</p> <ol style="list-style-type: none"> 1. No breakage, seizure or obstruction of drive train. 2. If using an external speed sensor, check for correct function. Check parameters: <ul style="list-style-type: none"> - P2192 (delay time for permitted deviation) 3. If using the torque envelope, check parameters: <ul style="list-style-type: none"> - P2182 (threshold frequency f1) - P2183 (threshold frequency f2) - P2184 (threshold frequency f3) - P2185 (upper torque threshold 1) - P2186 (lower torque threshold 1) - P2187 (upper torque threshold 2) - P2188 (lower torque threshold 2) - P2189 (upper torque threshold 3) - P2190 (lower torque threshold 3) - P2192 (delay time for permitted deviation) 4. Apply lubrication if required. 	

5.2 Alarm Messages

Alarm messages are stored in parameter r2110 under their code number (e.g. A0503 = 503) and can be read out from there.

A0501 Current Limit

Cause

- Motor power does not correspond to the inverter power
- Motor leads are too long
- Earth faults

Diagnosis & Remedy

Check the following:

- Motor power (P0307) must correspond to inverter power (r0206).
- Cable length limits must not be exceeded.
- Motor cable and motor must have no short-circuits or earth faults
- Motor parameters must match the motor in use
- Value of stator resistance (P0350) must be correct
- Motor must not be obstructed or overloaded
- Increase the ramp-up-time.
- Reduce the boost.

A0502 Overvoltage limit

Cause

Overvoltage limit is reached.

This warning is generated,

- if the dc-link controller is disabled (P1240 = 0).
- if pulses are enabled
- if actual dc voltage r0026 > r1242.

Diagnosis & Remedy

If this warning is displayed permanently, check drive input voltage .

A0503 UnderVoltage Limit

Cause

- Main supply failed
- Main supply (P0210) and consequently DC-link voltage (r0026) below specified limit (refer to parameter r0026).

Overvoltage can be caused either by too high main supply voltage or if motor is in regenerative mode.

Diagnosis & Remedy

Check main supply voltage (P0210).

A0504 Inverter OverTemperature

Cause

Warning level of inverter heat-sink temperature (P0614) is exceeded, resulting in pulse frequency reduction and/or output frequency reduction (depending on parameterization in (P0610)

Diagnosis & Remedy

Check the following:

- Ambient temperature must lie within specified limits
- Load conditions and duty cycle must be appropriate

A0505 Inverter I2T

Cause

- Overload alarm limit P0294 is exceeded (refer to utilization r0036)
- Pulse frequency and output frequency are reduced as a function of the parameter setting P0290.

Diagnosis & Remedy

Check that duty cycle lies within specified limits

A0506 Inverter duty cycle

Cause

Difference between heatsink and IGBT junction temperature exceeds warning limits

Diagnosis & Remedy

Check that duty cycle and shock loads lie within specified limits

A0511 Motor Over Temperature**Cause**

- Motor overloaded.
- Load duty cycle too high.

Diagnosis & Remedy

Independently of the kind of temperature determination check:

- P0604 motor temperature warning threshold
- P0625 motor ambient temperature
- If (P0601 = 0 or 1) Check the following:
 1. Check if name plate data are correct (if not perform quick commissioning)
 2. Accurate equivalent circuit data can be found by performing motor identification (P1910=1).
 3. Check if motor weight (P0344) is reasonable. Change if necessary.
 4. Via P0626, P0627, P0628 the standard overtemperatures can be changed, if the motor is not a Siemens standard motor.
- If (P601 = 2) Check the following:
 1. Check if temperature shown in r0035 is reasonable.
 2. Check if the sensor is a KTY84 (other sensors are not supported)

A0520 Rectifier OverTemperature**Cause**

Warning level of rectifier heat-sink temperature (P) is exceeded

Diagnosis & Remedy

Check the following:

- Ambient temperature must lie within specified limits
- Load conditions and duty cycle must be appropriate
- Fan must turn when drive is running

A0521 Ambient OverTemperature**Cause**

Warning level of ambient temperature (P) is exceeded

Diagnosis & Remedy

Check the following:

- Ambient temperature must lie within specified limits
- Fan must turn when drive is running
- Fan intake air has to be without any resistance

A0522 I2C read out timeout**Cause**

the cyclic access to the UCE Values and powerstack temperatures via the i2c bus (only for frame sizes FX and GX) is disturbed

A0523 Output fault**Cause**

One phase of output is disconnected

Diagnosis & Remedy

Warning can be masked.

A0535 Braking Resistor Hot**A0541 Motor Data Identification Active****Cause**

Motor data identification (P1910) selected or running

A0542 Speed Control Optimization Active**Cause**

Speed Control Optimization (P1960) is selected or running

A0590 Encoder feedback loss warning**Cause**

Signal from Encoder lost; Inverter might have switched to sensorless vector control(check also alarm value r0949):

Diagnosis & Remedy

Stop inverter and then

- Check encoder fitted. If encoder fitted and r0949 = 5, select encoder type via P0400.
- If encoder fitted and r0949 = 6, check connections between encoder module and inverter.
- If encoder not fitted and r0949 = 5, select SLVC mode (P1300 = 20 or 22).
- If encoder not fitted and r0949 = 6, set P0400 = 0.
- Check connections between encoder and inverter
- Check that encoder not faulty (select P1300 = 0, run at fixed speed, check encoder feedback signal in r0061)
- Increase encoder loss threshold in P0492

A0600 RTOS Overrun Warning

A0700 CB warning 1 see CB manual for details.

A0701 CB warning 2 see CB manual for details.

A0702 CB warning 3 see CB manual for details.

A0703 CB warning 4 see CB manual for details.

A0704 CB warning 5 see CB manual for details.

A0705 CB warning 6 see CB manual for details.

A0706 CB warning 7 see CB manual for details.

A0707 CB warning 8 see CB manual for details.

A0708 CB warning 9 see CB manual for details.

A0709 CB warning 10 see CB manual for details.

A0710 CB communication error**Cause**

Communication with CB (communication board) is lost

Diagnosis & Remedy

Check CB hardware

A0711 CB configuration error**Cause**

CB (communication board) reports a configuration error.

Diagnosis & Remedy

Check CB parameters

A0910 Vdc-max controller de-activated**Cause**

Vdc max controller has been de-activated, since controller is not capable of keeping DC-link voltage (r0026) within limits (refer to r0026 and P1240).

- Occurs if main supply voltage (P0210) is permanently too high.
- Occurs if motor is driven by an active load, causing motor to go into regenerative mode.
- Occurs at very high load inertias, when ramping down.

Diagnosis & Remedy

Check the following:

- Input voltage (P0210) must lie within range.
- Load must be match.

A0911 Vdc-max controller active**Cause**

Vdc max controller is active; so ramp-down times will be increased automatically to keep DC-link voltage (r0026) within limits (refer to r0026 and P1240).

A0912 Vdc-min controller active**Cause**

Vdc min controller will be activated if DC-link voltage (r0026) falls below minimum level (refer to r0026 and P1240).

- The kinetic energy of the motor is used to buffer the DC-link voltage, thus causing deceleration of the drive!
- So short mains failures do not necessarily lead to an undervoltage trip.

A0920 ADC parameters not set properly.**Cause**

ADC parameters should not be set to identical values, since this would produce illogical results.

- Index 0: Parameter settings for output identical
- Index 1: Parameter settings for input identical
- Index 2: Parameter settings for input do not correspond to ADC type

A0921 DAC parameters not set properly.**Cause**

DAC parameters should not be set to identical values, since this would produce illogical results.

- Index 0: Parameter settings for output identical
- Index 1: Parameter settings for input identical
- Index 2: Parameter settings for output do not correspond to DAC type

A0922 No load applied to inverter**Cause**

No Load is applied to the inverter. As a result, some functions may not work as under normal load conditions.

A0923 Both JOG Left and JOG Right are requested**Cause**

Both JOG right and JOG left (P1055/P1056) have been requested. This freezes the RFG output frequency at its current value.

Diagnosis & Remedy

Do not press JOG right and left simultaneously.

A0952 Belt Failure Detected**Cause**

Load conditions on motor indicate belt failure or mechanical fault.

Diagnosis & Remedy

Check the following:

1. No breakage, seizure or obstruction of drive train.
2. If using an external speed sensor, check for correct function. Check parameters:
 - P0409 (pulse per min at rated speed).
 - P2191 (Belt failure speed tolerance).
 - P2192 (delay time for permitted deviation)
3. If using the torque envelope, check parameters:
 - P2182 (threshold frequency f1)
 - P2183 (threshold frequency f2)
 - P2184 (threshold frequency f3)
 - P2185 (upper torque threshold 1)
 - P2186 (lower torque threshold 1)
 - P2187 (upper torque threshold 2)
 - P2188 (lower torque threshold 2)
 - P2189 (upper torque threshold 3)
 - P2190 (lower torque threshold 3)
 - P2192 (delay time for permitted deviation)
4. Apply lubrication if required.

A0936 PID Autotuning Active**Cause**

PID Autotuning (P2350) selected or running