

# Inverter Fault Checklist

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## Inverter Fault Checklist

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If site is complaining of poor airflow;

Confirm drive is running at **(at least)** 45Hz.

If so, then removing the inverter will **not** help.

The fault will be mechanical—Possibilities are a slipping motor/belt, a hatch left open or blocked vents/dirty filters.

1) Electricians check if drive is powered using a voltmeter. Should have a voltage between each phase, and a minimum voltage of 390V needs to be present for proper operation.

1a) If it's not powered, **wiring it out is not going to help** and further investigation is required on upstream supply. If there is power, continue checks before wiring out.

2) Has the drive tripped?

ABBs give a clear fault code and description, other drives we may need to provide a list of codes - please contact Quintex. List of common codes below for ABB and VACON are below.

If the drive has tripped on Overcurrent, it may not be safe to wire out the drive as this just passes the failure point to the panel.

2a) Check motor condition and perform a windings test before removing inverter.

3) Has the drive got a 'run signal'? This will be indicated by a display icon. Photos for ABB shown below.

4) If ABB drive confirm drive is in AUTO?

Press AUTO to start drive.

5) If all checks are positive try:

5a) Turn off Cheetah Display and see if drive runs - Cheetah has a fail to full default if Display is not powered.

6) Is the fan running very slowly?

This would suggest excess current draw and drive is protecting the motor motor windings test required.

7) Set drive to 50Hz and measure motor voltage, should be around 400V.

8) Drive smells burnt or no motor output once everything else checked - then wire out.

Fault Code	Fault ID	Fault Name	Possible Cause	How To Correct the Fault
[1]	1)	Overcurrent (hardware fault)	There is too high a current (>4*I <sub>H</sub> ) in the motor cable. Its cause can be 1 of these; <ul style="list-style-type: none"> <li>• A sudden heavy load increase</li> </ul>	Do a check of the loading Do a check of the motor. Do a check of the cables and connections.
	2)	Overcurrent (software fault)	<ul style="list-style-type: none"> <li>• A short circuit in the motor cables</li> <li>• The motor is not the correct type</li> <li>• The parameter settings are not properly made</li> </ul>	Make an identification run. Set the acceleration time longer (P3.4.1.2 and P3.4.2.2)
[2]	10)	Overvoltage (hardware fault)	The DC-link voltage is higher than the limits <ul style="list-style-type: none"> <li>• The deceleration time is too short</li> </ul>	Set the deceleration time longer. (P3.4.1.3 and P3.4.2.3) Activate the overvoltage controller. Do a check of the input voltage.
	11)	Overvoltage (software fault)	<ul style="list-style-type: none"> <li>• High overvoltage spikes in the supply</li> </ul>	
[3]	20)	Earth fault (hardware fault)	The measurement of current tells that the sum of the motor phase current is not 0. <ul style="list-style-type: none"> <li>• An insulation malfunction in the cables or the motor</li> </ul>	Do a check of the motor cables and the motor. Do a check of the filters.
	21)	Earth fault (software fault)	<ul style="list-style-type: none"> <li>• A filter (du/dt, sinus) malfunction</li> </ul>	
[4]	40)	Charging switch	The charging switch is closed and the feedback information is OPEN <ul style="list-style-type: none"> <li>• Operation malfunction</li> <li>• Defective component</li> </ul>	Reset the fault and restart the drive. Do a check of the feedback signal and the cable connection between the control board and the power board. If the fault occurs again, ask instructions from the distributor near you.
[5]	60)	Saturation	<ul style="list-style-type: none"> <li>• Defective IGBT</li> <li>• De-saturation short circuit in the IGBT</li> <li>• A short circuit or an overload in the brake resistor</li> </ul>	This fault cannot reset from the control panel. Make a power down of the drive. <b>DO NOT RESTART THE DRIVE or CONNECT THE POWER!</b> Ask instructions from the factory.

Fault code	Fault ID	Fault Name	Possible Cause	How to Correct the Fault
[8]	600)	System Fault	There is no communication between the control board and the power.	Reset the fault and restart the drive.
	601)		Defective component. Operation malfunction.	Download the newest software from the Danfoss Drives website.
	602)		Defective component. Operation malfunction. The voltage of auxiliary power in the power unit is too low.	Update the drive with it.  If the fault occurs again, ask instructions from the distributor near to you.
	603)		Defective component. Operation malfunction. Output phase voltage does not agree to the reference. Feedback fault.	
	604)		Defective component. Operation malfunction.	
	605)		The software of the control unit is not compatible with the software of the power unit.	
	606)		The software version cannot be read. There is no software in the power unit. Defective component. Operation malfunction (a problem in the power board or the measurement board)	
	607)		A CPU overload.	
	608)		Defective component. Operation malfunction	Reset the fault and make power down of the drive twice. Download the newest software from the Danfoss Drives website. Update the drive with it.
	609)			

Fault Code	Fault ID	Fault Name	Possible Cause	How to Correct the Fault
[9]	80)	Undervoltage (fault)	<p>The DC link voltage is lower than the limits.</p> <ul style="list-style-type: none"> <li>• The supply voltage is too low.</li> <li>• A defective component.</li> <li>• A defective input fuse.</li> <li>• The external charge switch is not closed.</li> </ul> <p><b>Note</b></p> <p>This fault becomes active only if the drive is in Run state.</p>	<p>If there is a temporary supply voltage break, reset the fault and restart the drive.</p> <p>Do a check of the supply voltage. If the supply voltage is sufficient, there is an internal fault.</p> <p>Examine the electrical network for fault.</p> <p>Ask instructions from the distributor near you.</p>
[10]	91)	Input phase	<ul style="list-style-type: none"> <li>• Supply voltage malfunction.</li> <li>• A defective fuse or malfunction in the supply cables.</li> </ul> <p>The load must be a minimum of 10-20% for the supervision to work.</p>	<p>Do a check of the supply voltage, the fuses and supply cable, the rectifying bridge and the gate control of the thyristor (MR6 -&gt;)</p>
[11]	100)	Output phase supervision	<p>The measurement of current tells that there is no current in 1 motor phase.</p> <ul style="list-style-type: none"> <li>• A motor or motor cables malfunction</li> <li>• A filter (du/dt, sinus) malfunction</li> </ul>	<p>Do a check of the motor cable and the motor.</p> <p>Do a check of the du/dt or sinus filter.</p>
[13]	120)	AC drive under temperature (fault)	<p>The temperature is too low in the heatsink of the power unit or in the power board.</p>	<p>The ambient temperature is too low for the drive. Move the drive in a warmer position.</p>

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.
[A2B1]	Overcurrent	<p>Output current has exceeded internal fault limit.</p> <p>In addition to an actual overcurrent situation, this warning may also be caused by an earth fault or supply phase loss.</p>	<p>Check motor load.</p> <p>Check acceleration times in parameter group 23 speed reference ramp (speed control) or 28 frequency reference chain (frequency control)</p> <p>Also check parameters 46.01 speed scaling, 46.02 frequency scaling and 46.03 torque scaling.</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 in the hardware manual of the drive</i>.</p> <p>Check there are no contactors opening and closing in motor cable.</p> <p>Check that the start-up data in parameter group 99 motor data 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 in the Hardware manual of the drive</i>. If an earth fault is found, fix or change the motor cable and/or motor. If no earth fault can be detected, contact your local ABB representative.</p>

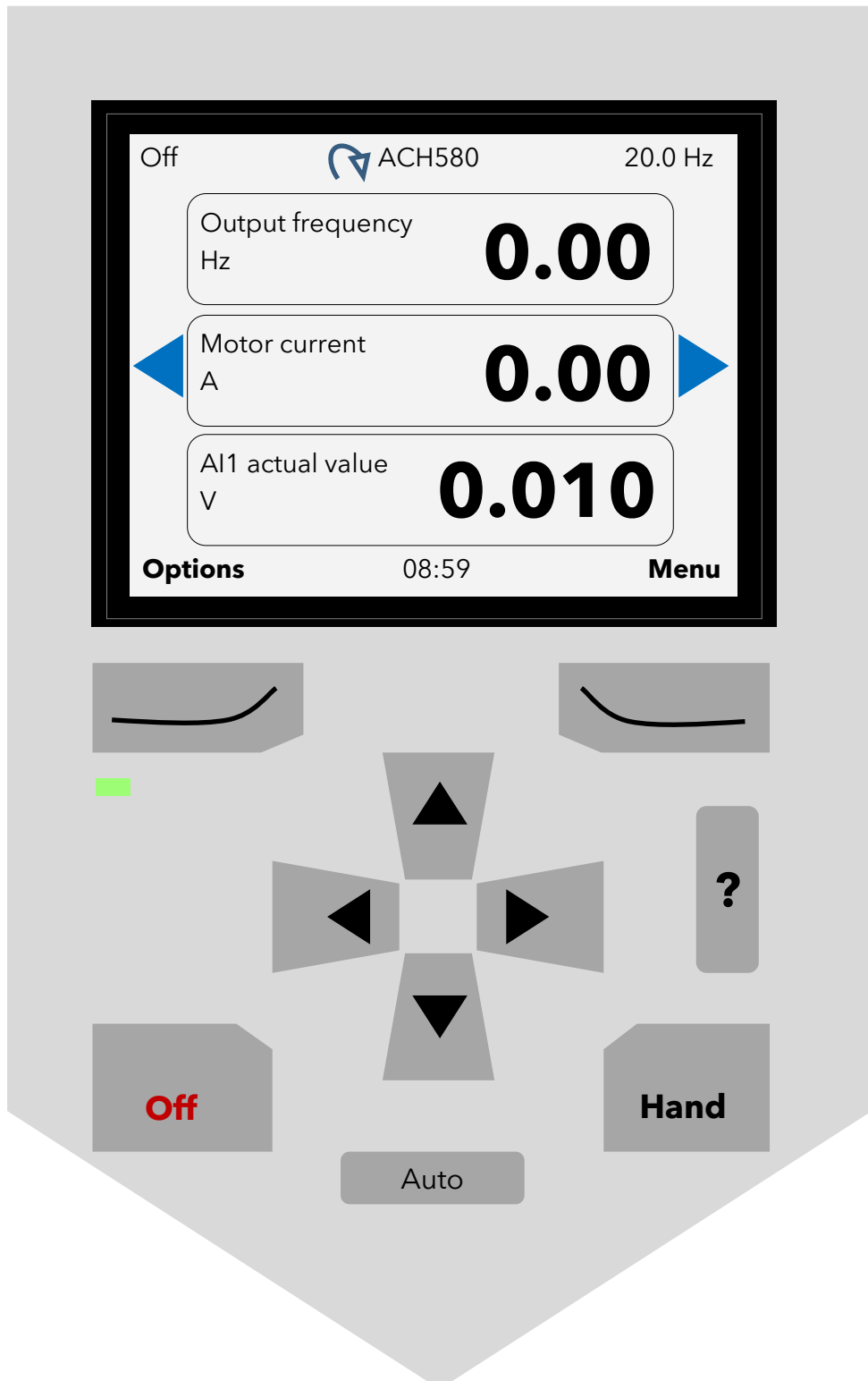
Code (hex)	Warning / Aux. Code	Cause	What to Do
[A2B4]	Short circuit	Short-circuit in motor cable(s) or motor.	<p>Check motor and motor cable for cabling errors.</p> <p>Check motor and motor cable (including phasing and delta/star connection)</p> <p>Check for an earth fault in motor or motor cables by 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 in the hardware manual of the drive</i>.</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 fans 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	Temperature cannot be supervised due to incorrect adapter setup.	Check the settings of temperature source parameters <i>35.11</i> and <i>35.21</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 2</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 2 warning limit</i></p>
[A492]	External temperature 2 (editable message text)	Measured temperature 2 has exceeded warning limit.	<p>Check the value of parameter <i>35.03 Measured temperature 2</i>.</p> <p>Check the cooling of the motor (or other equipment whose temperature is being measured)</p> <p>Check the value of <i>35.23 Temperature 2 warning limit</i>.</p>

Code (hex)	Warning / Aux. Code	Cause	What to Do
[A4A0]	Control board temperature	Control board temperature is too high	Check the auxiliary code. See actions for each code below.
	(none)	Temperature above warning limit	Check ambient conditions. Check air flow and fan operation Check heatsink fins for dust pick-up
	1	Thermistor broken	Contract an ABB service representative for control board replacement.



# Photos of ABB keypad

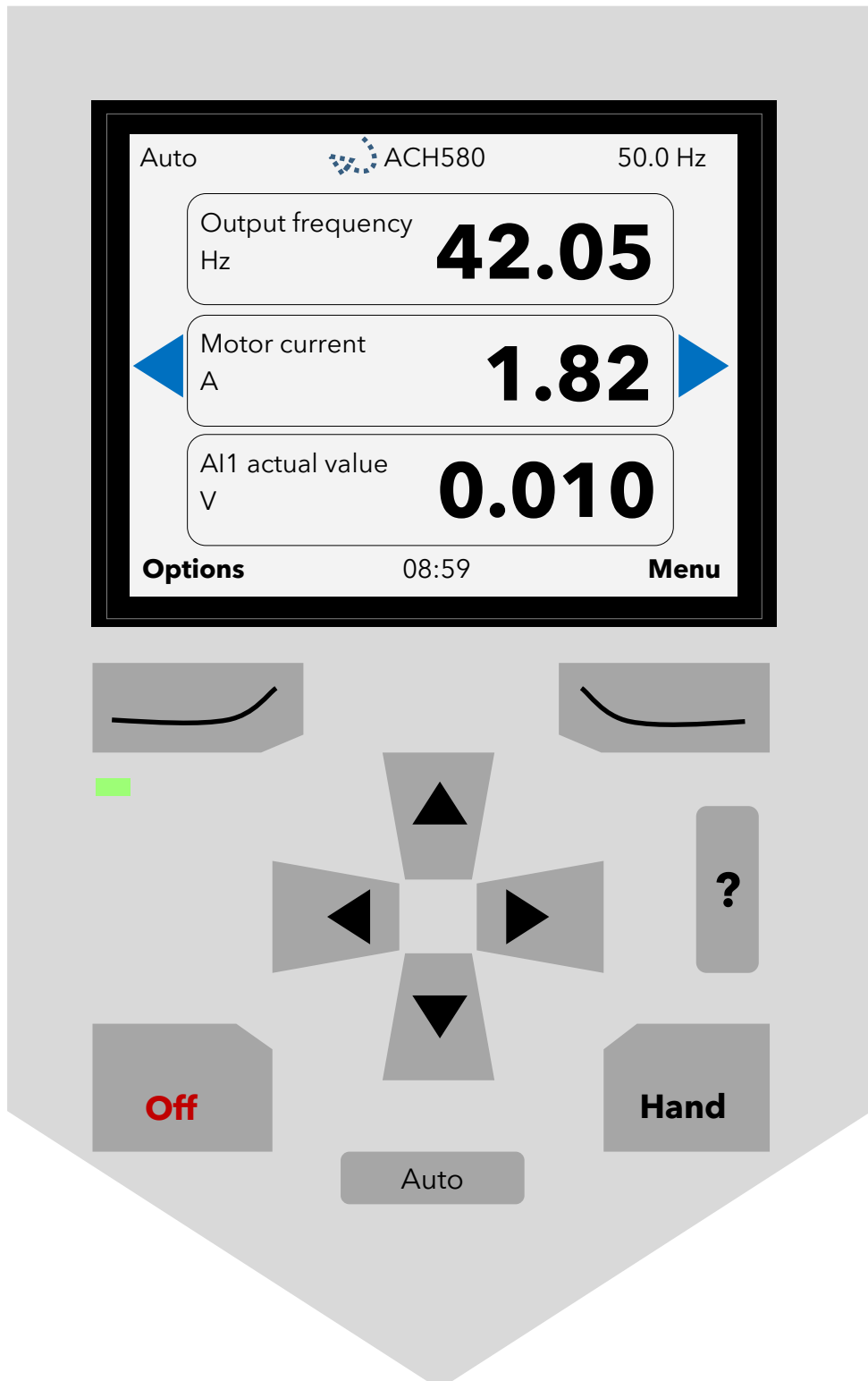
Drive if OFF  
Press AUTO button to start



# Photos of ABB keypad

Drive is running normally.

Note turning arrow beside ACH580 text. Dotted means drive is not a reference. Reference speed is shown top right of display.



# Photos of ABB keypad

Drive in HAND mode, not under Cheetah control.  
To rectify press AUTO button at bottom of keypad.

