



## Maintenance / Troubleshooting / Repair

Fault Code	Fault Description Causes / Repair
---	Diagnosis not possible <ul style="list-style-type: none"><li>• Check electrical connections.</li><li>• Diagnostic Device defective.</li><li>• Test ECU and replace if necessary.</li></ul>
000	Normal Operation
004	<b>Function normally not used in North America</b> <ul style="list-style-type: none"><li>• Check for short circuit between pin 16 (B1) and appropriate relay.</li><li>• If there is no short, test ECU and replace if necessary.</li></ul>
005	<b>Function normally not used in North America</b> <ul style="list-style-type: none"><li>• Check for short circuit between pin 15 (B1) and appropriate relay or security system input.</li><li>• If there is no short, test ECU and replace if necessary.</li></ul>
006°	Altitude sensor fault <ul style="list-style-type: none"><li>• Check if sensor is connected properly. (Only applicable with “H-kit” heaters°)</li><li>• Connect sensor to EDITH for further diagnosis.</li></ul>
009	<b>Optional safety shutdown</b> <b>Function normally not used in North America</b> <ul style="list-style-type: none"><li>• Signal at pin 13 (S1) changed from (+) to (-) or a (+) signal is detected at pin 14 (S1).</li><li>• If above does not resolve problem test ECU and replace if necessary.</li></ul>
010	<b>Overvoltage detected for at least 20 seconds without interruption.</b> <ul style="list-style-type: none"><li>• Check voltage between pin 1 (red wire) and 10 (brown wire) (B1). Voltage here should be the same as the battery.</li><li>• Voltage must be less than 16 volts for 12 volt heater.</li><li>• Voltage must be less than 32 volts for 24 volt heater.</li><li>• Check if battery charger is connected. If so disconnect charger.</li><li>• Check vehicle charging system. If there is a problem correct as necessary.</li></ul>
011	<b>Undervoltage detected for at least 20 seconds without interruption.</b> <ul style="list-style-type: none"><li>• Check voltage between pin 1 (red wire) and 10 (brown wire) (B1). Voltage here should be the same as the battery.</li><li>• If voltage is lower check fuses and wiring for damage. Check battery connections for corrosion and proper contact.</li><li>• Voltage must be more than 10 volts for 12 volt heater.</li><li>• Voltage must be more than 21 volts for 24 volt heater.</li><li>• Check voltage before and after heater is started.</li><li>• Check if fuses, connections and wiring are in good condition.</li><li>• Check vehicle charging system. If there is a problem correct as necessary.</li></ul>
012	Overheat at overheat sensor <ul style="list-style-type: none"><li>• Check air ducting for excessive restriction or blockage.</li><li>• Check if ducting length is within specification. (Ref. to product catalogue)</li><li>• Measure resistance of both the overheat sensor and flame sensor to see if they are within specification. (pg. 29)</li><li>• Perform Fuel Quantity test (pg. 29)</li></ul>
013	Overheat at flame sensor <ul style="list-style-type: none"><li>• Check air ducting for excessive restriction or blockage.</li><li>• Check if ducting length is within specification. (Ref. to product catalogue)</li><li>• Measure resistance of both the flame sensor and overheat sensor to see if they are within specification. (pg. 29)</li><li>• Perform fuel quantity test. (pg. 29)</li></ul>

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014 Excessive temperature difference between overheat and flame sensor	<ul style="list-style-type: none"> <li>• Check if sensor is mounted properly</li> <li>• Measure resistance of flame sensor and overheat sensor to see if it is within specification. (pg. 29)</li> <li>• Perform fuel quantity test. (pg. 29)</li> <li>• Measure resistance of both the flame sensor and overheat sensor to see if they are within specification. (pg. 29)</li> </ul>
015 ECU locked	<p><b>Occurs after Airtronic is switched on after 017 has been registered.</b></p> <ul style="list-style-type: none"> <li>• Unlock heater with an Espar diagnostic devise (EDITH, 7 day timer...)</li> <li>• Check troubleshooting suggestions for 012, 013 and 014.</li> </ul>
017 Overheat sensor -Maximum temperature reached	<ul style="list-style-type: none"> <li>• The ECU is locked because the temperature threshold has been exceeded and the ECU did not register fault code 012 and / or 013.</li> <li>• 015 will be displayed if unit is turned off after a 017.</li> <li>• Test ECU and replace if necessary.</li> </ul>
018° Ignition energy too low (only applicable with "H-Kit" heaters°)	<ul style="list-style-type: none"> <li>• Test glow pin as per fault code 20.</li> </ul>
019* Ignition energy too low	
020 Open circuit – Glow pin	<ul style="list-style-type: none"> <li>• Check glow pin resistance at 20 deg C</li> <li>• 12 volt heater: 0.42ohms - 0.7ohms</li> <li>• 24 volt heater: 1.2 ohms - 2.0 ohms</li> <li>• Check glow pin harness for damage, if it is routed and connected properly.</li> <li>• Check harness for continuity.</li> <li>• Test ECU and replace if necessary.</li> </ul>
021 Short circuit – Glow pin	
022* Short circuit after battery voltage – Glow pin	
025* Diagnostic cable short circuit after battery voltage	<ul style="list-style-type: none"> <li>• Fault Code(s) can not be displayed until fault has been corrected.</li> <li>• Check for damage to Diagnostic cable.</li> <li>• Heater is not compatible with diagnostic devise being used.</li> <li>• Check if diagnostic devise is working properly.</li> <li>• Check blower wiring and connections for proper routing and damage.</li> <li>• Check leads for continuity.</li> <li>• Test ECU and replace if necessary.</li> </ul>
031 Circuit interrupted – Blower motor	<ul style="list-style-type: none"> <li>• Check wiring for short circuit.</li> <li>• Apply appropriate voltage to blower and check current draw (8V for 12V heater 18V for 24V heater) Make sure power supply has at least 20amp short circuit resistance. If current is less then 6.5 amps test ECU and replace if necessary. If current is more then 6.5 amps replace blower.</li> </ul>
032 Short circuit – Blower motor	
033 Speed differential, no rotation, short circuit after negative	<p><b>Motor speed varies from specification by more then 10% for longer then 30 seconds.</b></p> <ul style="list-style-type: none"> <li>• Use non contact RPM meter to measure speed of blower (pg. 30)</li> <li>• If RPM is too low, check for restrictions or blockage, if there are no restrictions check remedies for fault code 032.</li> <li>• If RPM is too high check if magnet in impeller is mounted properly, if magnet is ok test RPM sensor if accurate. (Confirm RPM reading using EDITH software.)</li> <li>• Check for short circuit.</li> </ul>
034* Short circuit – Blower motor	<ul style="list-style-type: none"> <li>• Check blower wiring and connections for proper routing and damage.</li> <li>• Check leads for continuity.</li> <li>• Test ECU and replace if necessary.</li> </ul>



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047	Short circuit – Fuel metering pump	<ul style="list-style-type: none"><li>• Disconnect connector from FMP, restart heater, if 048 is displayed, FMP is defective.</li><li>• If 047 is still displayed disconnect harness from the heater and look for short circuit from pin 5 (B1) to negative (pin 10)</li><li>• If there is no short circuit test ECU and replace if</li></ul>
048	Open circuit – Fuel metering pump	<ul style="list-style-type: none"><li>• Disconnect fuel pump wiring and check if resistance is within specifications (pg. 30)</li><li>• If good reconnect wiring and check resistance from connector (B1) pin 5 and pin 10.</li><li>• If ok test ECU and replace if necessary.</li></ul>
049*	Short circuit after battery voltage - Metering pump	<ul style="list-style-type: none"><li>• Check wiring and connections for proper routing and damage.</li><li>• Check leads for continuity.</li><li>• Test ECU and replace if necessary.</li></ul>
050	Too many start attempts	<p><b>ECU is locked after too many start attempts (max. 255)</b></p> <ul style="list-style-type: none"><li>• Check fault codes in memory before unlocking ECU.</li><li>• Follow repair advice of codes in memory.</li><li>• Unlock ECU with a diagnostic devise.</li></ul>
051	Faulty flame recognition	<ul style="list-style-type: none"><li>• If temperature of flame sensor is greater then 70°C (158°F) when starting up the heater, the start attempt is delayed and blower will operate for a maximum of 15 minutes to cool down the flame sensor.</li><li>• If temperature does not fall below 70°C (158°F) within 15 min 051 will occur.</li><li>• If temperature decreases to an acceptable level the heater will attempt to start.</li><li>• Check resistance of Flame sensor. (pg. 29)</li></ul>
052	No flame detected – Start phase	<ul style="list-style-type: none"><li>• If there is actually a flame but it is not detected, check resistance of the flame sensor. (pg. 29)</li><li>• If there is no flame:</li><li>• Check combustion air intake and exhaust lines for interference.</li><li>• Check glow pin screen (should be replaced yearly) and ventilation hole (should be inspected when screen is replaced)</li><li>• Perform Fuel Quantity Test (pg. 29)</li></ul>
053	Flame cutout during: Power/ Bust mode	<p><b>Heater has started successfully but flame has extinguished.</b></p> <ul style="list-style-type: none"><li>• Check combustion air intake and exhaust.</li><li>• Check fuel supply perform fuel quantity test. (pg. 29)</li><li>• Inspect fuel lines for bubble formation.</li><li>• Check if appropriate grade of fuel is being used according to temperature. (pg. 29)</li></ul>
054	High mode	
055	Medium mode	
056	Low mode	
057°	Start phase (only applicable with "H-Kit" heaters°)	<ul style="list-style-type: none"><li>• Check if flame sensor resistance is within specification and mounted properly. (pg. 29)</li><li>• Test ECU and replace if necessary.</li></ul>
060	Circuit interrupted – external temperature sensor	<p><b>Sensor detects a temperature beyond it's range.</b></p> <ul style="list-style-type: none"><li>• Measure resistance at pins 6 and 12. (B1)</li><li>• The circuit would be detected as open if the resistance is greater then 3k ohms (7175 ohms*)</li><li>• Test ECU and replace if necessary.</li></ul>
061	Short circuit – external temperature sensor	<ul style="list-style-type: none"><li>• Measure resistance at pins 6 and 12. (B1)</li><li>• A short circuit will be detected if the resistance is less then 800 ohms (486 ohms')</li><li>• Test ECU and replace if necessary.</li></ul>

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062 Circuit Interruption – Control switch	<p><b>Temperature setting out of resistance range</b>  <b>Heater runs in High mode only</b></p> <ul style="list-style-type: none"> <li>• Check resistance between pins 6 and 7 at B1. (Test will only work with thermostat and rheostat. Resistance check will not work with Mini controller or Digi controller) Resistance should be between 1740 – 2180 ohms.</li> <li>• Mini controller or Digi controller should be tested while heater is connected to EDITH.</li> <li>• If resistance is ok test ECU and replace if necessary.</li> </ul>
063 Short circuit - Control switch	<p><b>Short circuit is detected between pins 6 and 7 after heater has started.</b></p> <ul style="list-style-type: none"> <li>• If short occurred before heater is started heater will be in ventilation mode.</li> <li>• Check wiring connected to pins 6 and 7 for a short.</li> <li>• If there is a switch connected to pins 6 and 7 test if switch is working properly.</li> <li>• Disconnect switch. If 063 still appears test ECU and replace if necessary.</li> <li>• Short will be registered between pins 6 and 7 less than 800 ohms (486 ohms*).</li> <li>• Normal value is 1740 – 2180 ohms.</li> </ul>
064 Open circuit – flame sensor	<ul style="list-style-type: none"> <li>• Disconnect flame sensor and check if resistance is within specification. (Green connector. Pg. 29)</li> <li>• Open circuit detected at 3k ohms (7175 ohms*)</li> <li>• If resistance is ok test ECU and replace if necessary.</li> </ul>
065 Short circuit – flame sensor	<ul style="list-style-type: none"> <li>• Disconnect flame sensor (green connector) and scan for fault codes again.</li> <li>• If 064 comes up replace combo sensor.</li> <li>• If 065 comes up, test ECU and replace if necessary.</li> <li>• Short circuit resistance is less than 500 ohms (486 ohms*)</li> </ul>
071 Open circuit – overheat sensor	<ul style="list-style-type: none"> <li>• Disconnect both the flame and overheat sensor from the ECU.</li> <li>• Measure resistance between the blue and brown/white wire. (Pg. 29)</li> <li>• The ECU will record an open circuit if the resistance is greater than 1600k ohms (223k ohms*)</li> </ul>
072 Short circuit- overheat sensor	<ul style="list-style-type: none"> <li>• Disconnect both the flame and overheat sensor from the ECU and scan for fault codes again.</li> <li>• If 071 comes up replace combo sensor.</li> <li>• If fault 072 is still displayed test ECU and replace if necessary.</li> <li>• Short circuit resistance is less than 95 ohms (183 ohms*)</li> </ul>
074* Overheat threshold not detected	<ul style="list-style-type: none"> <li>• Test ECU and replace if necessary.</li> </ul>
090 Control Unit defect	<ul style="list-style-type: none"> <li>• Test ECU and replace if necessary.</li> </ul>
091 External voltage interference	<p><b>Fault due to inconsistent voltage</b></p> <ul style="list-style-type: none"> <li>• Inspect power system. (Battery, Battery charger, Alternator)</li> <li>• Check the fuses, the supply cables, the negative connections and the positive support point on the battery for corrosion and correct contact.</li> </ul>
092 Internal Memory Error	<ul style="list-style-type: none"> <li>• Disconnect power for 10 seconds. Reconnect and test gain.</li> </ul>
093*	<ul style="list-style-type: none"> <li>• Test ECU and replace if necessary.</li> </ul>
094	
095*	



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096 Internal temperature sensor defect.	<ul style="list-style-type: none"> <li>• Replace ECU or install an external temperature sensor.</li> </ul>
097 Control Unit defect	<ul style="list-style-type: none"> <li>• Replace Control Unit.</li> </ul>
098* 099* Short term Voltage drop.	<p><b>Voltage less then 5 - 6 volt (for 12 volt) or less then 7 - 8 volt (for 24 volt).</b></p> <ul style="list-style-type: none"> <li>• Check the fuses, the supply cables, the negative connections and the positive support point on the battery for corrosion and correct contact.</li> <li>• Check if power supply can provide the appropriate amount of current while heater is running. (At least 10 amp supply recommended.) Transistor error in control box.</li> <li>• Check lead harness of the external components for continuity, has been correctly laid and check for damage.</li> <li>• Test ECU and replace if necessary.</li> </ul> <p><b>Transistor error in control box.</b></p> <ul style="list-style-type: none"> <li>• Check lead harness of the external components for continuity, has been correctly laid and check for damage.</li> <li>• Test ECU and replace if necessary.</li> </ul>

High Altitude Sensor Fault Code	Fault Description Causes / Repair
0 No faults.	
11 Communication Lost.	<ul style="list-style-type: none"> <li>• Check wiring and connections</li> </ul>
12 No altitude adjustment.	<ul style="list-style-type: none"> <li>• Use heater that is compatible with this high altitude sensor or use a different high altitude devise (Pg. 3)</li> </ul>
13 Air pressure sensor fault.	<ul style="list-style-type: none"> <li>• Replace the air pressure sensor.</li> </ul>

\* Codes are only applicable for new style ECU's.  
To date new style ECU's wiring is wrapped with tape.  
Old style ECU's are bundled in PVC.

◦ Codes and comments apply to ECU's with integrated high altitude compatibilities. (Ref. pg. 3)

• Resistance values apply to old style ECU's. Ref. to \* for description of difference between old and new style ECU's.