



FRONT PANEL ERROR / STATUS CODES

INTRODUCTION / CODE LIST

The AT Series microprocessor control circuitry performs diagnostic checks of the battery charger during system start-up, then continuously during operation. If it detects a *failure*, or a *special status*, an intermittent code will appear on the front control panel, displayed between dc output values.

The following table is a list of these error (**E ##**) and status (**A ##**) codes.

Code	Explanation
E 01	rating resistor R2 open or defective
E 02	short circuit on dc output
E 03	high dc voltage shutdown occurrence
E 04	internal memory failure
E 0b	voltage sense failure (internal / external / remote)
E 07	dc breaker open, or dc output wiring defective
E 08	remote TempCo probe defective
E 10	open internal feedback loop
E 12	internal over-temp circuit defective
E 13	rectifier over-temperature occurrence
E 14	forced load sharing not working properly
A 01	manual equalize enabled for more than 24 hours
A 02	equalize mode inhibited
A 04	voltmeter calibration inhibited w/TempCo active
A 05	dc output at Current Limit setting

Codes **E 05**, **E 09**, **E 11**, and **A 03** are not used at time (5/2/2023) of this printing.

CODE LABEL

A permanent decal (p/n [JC5029-00](#)) features a list of these codes, and is affixed to the inside front panel door of the AT Series battery charger.

AT10.1 / AT30 ERROR & STATUS CODES	Code	Explanation	Corrective Action	Code	Explanation	Corrective Action
	E01	rating resistor R2 open or defective	replace R2 & restart	E10	open internal feedback loop	manual Sect 3-2
	E02	short circuit on dc output	manual Sect. 3-2	E11	<i>not used</i>	
	E03	high dc voltage shutdown occurrence	manual Sect. 3-2	E12	defective internal over-temp circuit	manual Sect 3-2
	E04	internal memory failure	restart & recalibrate	E13	rectifier over-temperature	manual Sect 3-2
	E05	<i>no longer used</i>		E14	forced load sharing not working properly	manual Apdx F
	E06	voltage sense failure (int/ext/rem)	manual Sect. 3-2	A01	manual eqlz enabled more than 24hrs	n/a
	E07	dc bkr open or defective dc wiring	close CB2 & restart	A02	equalize mode inhibited	n/a
	E08	defective remote TempCo probe	check probe & restart	A04	voltmeter calibration inhibited w/TempCo active	n/a
	E09	<i>no longer used</i>		A05	dc output at Current Limit setting	n/a

INTERPRETING FRONT PANEL MESSAGES

To solve an AT Series error code problem, or to understand a status code, refer to the table below, which lists the codes and procedures to use.



High voltages appear at several points inside the AT10.1/AT30. Use extreme caution when working inside the enclosure. Do not attempt to work inside the AT10.1/AT30 unless you are a qualified technician or electrician.

Disconnect and lock out all power from the AT10.1/AT30 before starting to remove or replace any components. Turn the ac power off at the distribution panel upstream from the charger. Disconnect the battery from the output terminals TB1(+/-). Allow any internal voltages to bleed off before proceeding.

Error Code	Meaning	Repair Procedure
E 01	resistor R2 open or defective	<p>The Rating Resistor (R2) is located at the back of the front instrument panel, installed into the Main Control PC Board (A1) input connector (J1) or the Gate Driver PC Board (A11/A15) input connectors (J18/J25/J26). R2 is measured by the control circuitry on startup, and is used to determine some of the AT10.1/AT30 model-specific parameters, such as float voltage.</p> <p>If the AT10.1/AT30 detects that R2 is defective (or improper), it must be replaced. See Section 3.6 for parts ordering information. When you have completed the repair, restart the AT10.1/AT30 according to Section 2.1.</p>
E 02	short circuit on dc output	<p>The AT10.1/AT30 may display this error code if the battery is discharged to less than 6 volts. When the battery re-charges to greater than 6 volts, the error code will disappear. If you have a seriously discharged battery, allow the AT10.1/AT30 to run for 24 hours and check the battery voltage again. If it has not increased to the normal voltage rating, consult the battery manufacturer for help.</p> <p>If the battery voltage is normal, check the wiring at the AT10.1/AT30 dc output terminals (TB1+/-) for a short circuit.</p> <p>If the battery voltage is normal, and all external wiring is satisfactory, check the AT10.1/AT30 dc output circuit breaker (CB2). If it is tripped, try once to reset it. If it trips again immediately, there may be an internal short circuit in the AT10.1/AT30. Check the internal wiring. If the AT10.1/AT30 is filtered, check the dc filter capacitors (C1/C2) and the polarity diode (CR1).</p> <p>Units normally recovers automatically from an E 02 condition. If you have shut down the AT10.1/AT30 for service, restart per Section 2.1.</p>
E 03	High DC Voltage Shutdown activated	<p>To restart the AT10.1/AT30, turn the ac breaker (CB1) off, then on. Check the Equalize voltage and High DC Voltage alarm settings. The HDCV alarm setting must be higher than the Equalize voltage setting.</p> <p>If you get another High DC Voltage shutdown after a few minutes of operation, there may be an internal component failure. See Charger output voltage too high, not controllable of the troubleshooting chart in Section 3.4.</p>

Error Code	Meaning	Repair Procedure
E 04	internal memory failure	<p>Any parameters that you set, such as Float or Equalize voltage, are saved internally. The internal memory is tested on startup. If the memory test fails, E 04 appears on the front display. The error may also appear if the controller was trying to write to the memory while a power failure occurred.</p> <p>If an E 04 appears, try shutting down the AT10.1/AT10. Restart by turning on the dc breaker (CB2) first, followed by the ac breaker (CB1). If the AT10.1/AT30 restarts normally, you must re-enter any changes you made to the factory settings (float voltage, etc.).</p> <p>If E 04 appears repeatedly, the internal memory has been damaged. You must replace the Main Control PC Board (A1). See Section 3.6 for parts ordering information.</p>
E 05	<i>not used</i>	<p>Error code E 05 was formerly used to indicate a reverse battery connection. It is not available in the AT10.1/AT30.</p>
E 06	defective R4 or R14 resistor, or remote sense wiring failure	<p>Identify the Positive (+) Scaling Resistor (R4). Remove the resistor (if possible) and measure its value with an Ohmmeter. See Table 3-1 in Section 3.6 for the correct value. If the resistor is not within 1% of the specified value, it must be replaced.</p> <p>Identify the Negative (-) Scaling Resistor (R14). Remove the resistor (if possible) and measure its value with an Ohmmeter. See Table 3-1 in Section 3.6 for the correct value. If the resistor is not within 1% of the specified value, it must be replaced.</p> <p>If you are using remote sense wiring from the battery to the AT10.1/AT30, the wiring may have failed. The usual failure is an open circuit. A shorted circuit will usually be indicated by smoke or fire in the wiring.</p> <p>The AT10.1/AT30 displays error code E 06 if it detects this remote sense wiring failure. You should respond to this problem quickly, to make sure the AT10.1/AT30 regulates the output voltage properly. Wire an annunciator (e.g. buzzer) to the summary alarm relay contact (TB3) for remote indication of any charger problem. Otherwise, monitor the AT10.1/AT30 operation using the optional DNP Level 3 / MODBUS Communications Module (JA0102-04).</p> <p>If a failure exists in remote sense wiring, the AT10.1/AT30 regulates output voltage locally until you correct the problem, see Section 1.9. The locally controlled voltage may not reflect the true requirements of the battery.</p> <p>When you complete the repair, restart the AT10.1/AT30 per Section 2.1.</p>
E 07	open dc breaker (CB2) or internal dc wiring failure	<p>If the dc output circuit breaker (CB2) is open, open the ac input breaker (CB1). Restart by closing dc breaker (CB2) first, followed by the ac breaker (CB1). If the dc breaker trips again, see the troubleshooting chart in Section 3.4.</p> <p>If the dc breaker (CB2) is closed, but you have an E 07 display, check your battery. If the battery is disconnected, and you then disconnect the dc load, the AT01.1/AT30 may display an E 07 code. Restart the AT10.1/AT30 according to Section 2.1.</p> <p>If the battery and dc load are satisfactory, see the troubleshooting chart in Section 3.4 for help in locating the problem.</p>

Error Code	Meaning	Repair Procedure
E 08	defective temperature compensation probe	<p>See Application Note (JD5003-00) for more detailed user instructions.</p> <p>If a remote temperature compensation probe (A10) is connected to the AT10.1/AT30, the control circuitry detects the probe on startup, and uses the temperature measured by the probe to control the output voltage of the charger. To understand temperature compensation, see Section 1.11.</p> <p>If the probe (A10) or the wiring that connects it to the Main Control PC Board (A1) fails during normal operation, the AT10.1/AT30 detects the failure and displays E 08 on the front panel meter.</p> <p>Disconnect the wiring at the probe, and measure the resistance across the quick-connect leads with an Ohmmeter. The resistance should measure approximately 10,000 Ω at normal room temperature (77° F / 25° C). If the probe reads open or shorted, it needs to be replaced.</p> <p>If the probe is satisfactory, examine the wiring between the probe and the AT10.1/AT30. Also check the connection of the cable to TB8 on the Main Control PC Board (A1) on the back of the front panel. If the wiring is satisfactory, the probe needs to be replaced. Once you have replaced the probe, you must restart the AT10.1/AT30 to reactivate temperature compensation.</p>
E 09	misadjusted Current Limit	<p>This code has been discontinued with the Main Control PC Board (A1) firmware Version 6.52.</p> <p>For older units with firmware Version 6.5.1 or earlier:</p> <p>The AT10.1/AT30 output Current Limit is set at the factory to 110% of the rated dc output current (e.g. for a 50 Adc charger, the Current Limit is set to 55 Adc). You can adjust the Current Limit downward to as low as 50% of the output current, if you have special requirements such as limited ac power available. You should do this only if the normal dc load on the system is smaller than the Current Limit.</p> <p>If you do reduce the Current Limit setting below 100% of rated current, your connected load might require more current than the AT10.1/AT30 can deliver. If this happens, the battery will not charge properly. If this occurs, the front panel meter displays error code E 09. You should increase the Current Limit setting so that the AT10.1/AT30 can supply all the current required by the load, and still charge the battery. The Current Limit should be set to at least 5% greater than the maximum continuous dc load current.</p> <p>For setting the Current Limit value, see Section 2.3.5.</p>
E 10	open internal feedback loop	<p>A redundant internal feedback loop (control loop) is provided to increase reliability when remote sensing is used. If there is a problem with the internal loop wiring, the front panel meter will display code E 10.</p> <p>Check the internal wiring in the main signal harness(es). Also check:</p> <ul style="list-style-type: none"> • the harness plug connector (J1) on the Main Control PC Board (A1) • the harness plug connector (J18) on the Gate Driver PC Board (A11) • the harness plug connector (J25) on the Gate Driver PC Boards (A15)
E 11	<i>not used</i>	This error code is not implemented at this time.
E 12	defective internal thermostat	<p>The rectifier heat sink(s) are equipped with over-temperature thermostats (S2x). On startup, the AT10.1/AT30 tests the thermostat(s), and displays E 12 if defective.</p> <p>Check the thermostat(s) (S2x) for continuity. Disconnect the wiring and resistor (R28x) from the quick connect terminals. The thermostat switch should be closed (NC) at normal room temperature.</p>

Error Code	Meaning	Repair Procedure
E 13	internal over-temperature	One or more of the rectifier thermostats (S2x) has detected an over-temperature condition. If the rectifier is equipped with fans (B2x), check all fans for proper operation. Also make sure that all enclosure vents are clear of debris, and that the ambient temperature is below 50°C (122°F).
E 14	forced load sharing not working properly	See AT Forced Load Sharing <i>Operating Instructions</i> (JA5054-00). Verify both AT10.1/AT30s are functioning properly. Ensure that the forced load sharing interconnection cable is not broken, is properly installed at A1-J4, and the connector (J4) for the "Secondary" charger has the jumper as described. Ensure that both AT10.1/AT30s are connected to the same ac supply, and that source phase rotation is the same for both units.
A 01	manual eqLz enabled for more than 24hr	If the AT10.1/AT30 was accidentally left in manual equalize mode, switch the unit back to float, manual equalize timer, or auto-equalize timer mode, according to Section 2.2.4 .
A 02	equalize mode inhibited	If you set the equalize timer to zero (0) hours, the equalize mode is inhibited. When you try to put the AT10.1/AT30 into equalize mode from the front panel controls, the meter displays status code A 02 . If you want to enable the equalize mode, set the equalize timer to one (1) or more hours.
A 03	<i>not used</i>	This error code is not implemented at this time.
A 04	voltmeter calibration inhibited w/TempCo active	While using temperature compensation, the AT10.1/AT30 internal dc voltmeter cannot be calibrated. Shut down the AT10.1/AT30 and disconnect one wire of the TempCo cable from TB8 on the Main Control PC Board (A1). Restart the AT10.1/AT30 and perform the voltmeter calibration according to Section 2.3.7 . Reconnect the TempCo cable to TB8, and restart the AT10.1/AT30. See Application Note (JD5003-00) for further details.
A 05	dc output at Current Limit setting	The AT10.1/AT30 is in Current Limit mode. This will occur when there is a large load on the dc bus, or the battery has discharged. Make sure that the AT10.1/AT30 is sized correctly for the application, and that the Current Limit value has been set correctly. See Section 2.3.5 .

ADDITIONAL CODES

The AT10.1/AT30 front panel 4-digit display utilizes calculator-type graphics to relay additional text messages to the user. Some of these codes may not be immediately apparent. Other codes are as follows.

<i>Pb / ni cd</i>	battery type for active temperature compensation	JD5003-00
<i>LS-P / LS-S</i>	forced load sharing status (primary / secondary)	JA5054-00
<i>ASL</i>	latching alarm reset	JA5098-00
<i>ESL</i>	battery open alarm test	JA5108-00

RELATED DOCUMENTS

Doc. No	Online Hyperlink	Description
JC5020-00	http://www.ATSeries.net/PDFs/JC5020-00.pdf	AT Series Charger Quick Setup Sheet
JD0064-01	http://www.ATSeries.net/PDFs/JD0064-01.pdf	AT Series Charger Start-up Procedure
JF5006-01	http://www.ATSeries.net/PDFs/JF5006-01.pdf	AT10.1 Sales Cut Sheet (unbranded)
JF5018-01	http://www.ATSeries.net/PDFs/JF5018-01.pdf	AT30 Sales Cut Sheet (unbranded)
JA0102-01	http://www.ATSeries.net/PDFs/JA0102-01.pdf	AT10.1 G1 Manual
JA0102-02	http://www.ATSeries.net/PDFs/JA0102-02.pdf	AT10.1 G2 Manual
JA0102-03	http://www.ATSeries.net/PDFs/JA0102-03.pdf	AT30 Manual
JA0102-04	http://www.ATSeries.net/PDFs/JA0102-04.pdf	AT Comm. Module Manual (unlabeled)
JA5015-00	http://www.ATSeries.net/PDFs/JA5015-00.pdf	AT TempCo Probe Acy. Instructions
JA5054-00	http://www.ATSeries.net/PDFs/JA5054-00.pdf	AT Forced Load Sharing Instructions
JA5098-00	http://www.ATSeries.net/PDFs/JA5098-00.pdf	AT Latching Alarm Relays Instructions
EJ5088-XX	http://www.ATSeries.net/PDFs/EJ5088-XX.pdf	AT Series Ground Detection Voltmeter
EJ5136-XX	http://www.ATSeries.net/PDFs/EJ5136-XX.pdf	AT Series Battery Discharge Alarm
EJ5137-XX	http://www.ATSeries.net/PDFs/EJ5137-XX.pdf	AT Series End Of Discharge Alarm
JD0064-00	http://www.ATSeries.net/PDFs/JD0064-00.pdf	Preventative Maintenance Procedure
JD5003-00	http://www.ATSeries.net/PDFs/JD5003-00.pdf	TempCo Probe Application Note
JD5011-00	http://www.ATSeries.net/PDFs/JD5011-00.pdf	External Free-Wheeling Diode App Note
JD5012-00	http://www.ATSeries.net/PDFs/JD5012-00.pdf	Main Ctrl PC Board (A1) Field Installation
JD5032-00	http://www.ATSeries.net/PDFs/JD5032-00.pdf	Ground Fault Detection Application Note
JD0052-00	http://www.ATSeries.net/PDFs/JD0052-00.pdf	Battery Discharge Dual Operation Note
JD5006-00	http://www.ATSeries.net/PDFs/JD5006-00.pdf	Alt. & Temp. De-Rating Application Note
JD5013-00	http://www.ATSeries.net/PDFs/JD5013-00.pdf	AC Ripple Specification Application Note
JD5036-00	http://www.ATSeries.net/PDFs/JD5036-00.pdf	About That "Blocking" Diode - App Note
JF5039-00	http://www.ATSeries.net/PDFs/JF5039-00.pdf	AT10.1/AT30 3rd Party Agency Approvals
JF5045-00	http://www.ATSeries.net/PDFs/JF5045-00.pdf	Proper Sizing of Industrial Batt Chargers