DTC P0A0C - Highest Cell Voltage Too High Fault

Product Family	Fault Supported
Orion BMS [Original] (24 - 180 Cell)	**NO**
Orion BMS 2 (24 - 180 Cell)	**YES**
Orion JR [Original] (16 Cell)	**NO**
Orion JR 2 (16 Cell)	**YES**

FAULT DESCRIPTION

IMPORTANT WARNING: Immediately disconnect any battery chargers or charge controllers from the battery pack to prevent further overcharging the batteries.

This fault code is triggered if the voltage of an individual cell (as measured by the BMS) exceeds the programmed maximum allowed cell voltage. This fault code will only trigger after a number of samplings over the period of 10 seconds to prevent false positives.

This fault can be caused by incorrect cell tap wiring, a loose or disconnected cell tap, a blown fuse inside the BMS, a high resistance or loose busbar, a cell which is actually over voltage, or from internal damage to the BMS unit due to previous wiring faults. This fault code should always be immediately investigated as the cells are likely being over-charged.

SAFETY WARNING: Cells which have been over-charged or over-discharged may not be safe to use even after bringing the voltage into a correct range. A cell which has previously been over-charged or over-discharged at any time may develop internal damage, compromising the safety of the cell. Always consult the cell manufacturer for advice on whether a cell can be safely used after an over-charge or over-discharge event.

Fault Code	Fault Description	Possible Trouble Area
P0A0D	One or more cell voltages are measured above programmed maximum allowed cell voltage.	- High Voltage Battery Assembly - Cell Wiring Assembly - Configuration Settings - Internal BMS Fault

FAULT BEHAVIOR

This fault, by itself, is **Informational Only** and will not directly inhibit BMS functions. Most likely other faults will be set which may take more aggressive action.

FAULT THRESHOLDS

Fault will trigger when the following condition is satisfied	(a)
(a) Cell voltage registers as over maximum allowed voltage.	One or more cells within the pack are measured above the programmed maximum cell voltage for at least 10 seconds.

DIAGNOSTIC STEPS

1.	**Immediately disconnect any charging sources from the pack.** If a charger is malfunctioning or failing to turn off (or if a relay or contactor is stuck ON) it may be severely over-charging the battery pack. Make sure no charging sources of any kind are connected to the battery pack.
2.	**Verify that the BMS has the ability to terminate charging.** If the BMS is unable to stop or inhibit charging the battery pack then it will not be able to protect cells from being overcharged. This mechanism should be

	tested to verify that it is working properly. **It is absolutely mandatory that the BMS have a direct means to turn off any and all charging sources.**
3.	**Verify that the maximum cell voltage settings are properly configured.** Double check that all the cell voltage settings on the "Cell Settings" tab of the BMS utility profile settings are correct. If the maximum cell voltage is too low that may cause this fault to set prematurely or under normal operation.
4.	**Verify proper cell voltage wiring and check for wiring related faults.** Certain subcodes can be caused by incorrectly wired cell voltage inputs (if the BMS is not receiving the proper voltages it can prevent the internal circuitry from operating properly). Typically an incorrectly wired (or damaged) cell input would show up as a secondary fault code (such as **P0A04** or **P0AFA**). If any of these fault codes are actively set, they should be investigated first as they may help indicate the root cause for this fault being set.
5.	**Manually verify the cell voltage in question.** Using a handheld multimeter or voltage measurement device, manually verify the voltage of the cell that the BMS has identified as being too low. If the voltage measurement does not match what the BMS is reporting then there may either be an external wiring related issue or an issue internal to the BMS itself. Please see the "Incorrect Cell Voltage Readings" troubleshooting entry in the Troubleshooting Guide for more details on ways to diagnose a cell voltage reading incorrectly.
6.	**Download the freeze frame for the fault code using the BMS Utility.** The BMS will normally produce a freeze frame on the "Diagnostic Trouble Codes" screen in the BMS Utility when this fault code occurs that contains a comprehensive list of BMS data parameters at the time the fault occurred. **It is strongly recommended that the freeze frame be downloaded from the BMS and saved to disk before the fault is cleared again** as this data may assist in the future if further diagnostics are required. Additionally this freeze frame data may be requested by Technical Support if further assistance is required. **NOTE:** Only Fault Codes with a (F) next to them have freeze frame data available for download. If there is no (F) next to the fault, there is no stored freeze frame available and this step can be skipped. Steps to download the Freeze Frame: 1) Connect to the BMS using the Orion BMS utility. 2) Click the "Diagnostic Trouble Codes" tab at the top.

	3) Select the correct fault code by clicking on the ID on the left side of the screen to initiate the Freeze Frame retrieval. 4) Once the retrieval process is complete, click the "Export (CSV)" button to save the freeze frame data to the computer disk.
7.	**If the problem persists, contact technical support.** If all above steps fail to determine the cause of the fault then additional support is needed. **Please contact the company or reseller that the BMS was originally purchased from for additional questions, warranty claims, repair requests and technical support.**