



Number: TSB-FC-2021-012

Model & Symptom: SC50 charger alarm and fault codes.

Date: June 4, 2021

Author: Christian Rayas

Urgency:

☐

HIGH: Immediate action is required. Service visit must be scheduled.

☐

MEDIUM: Action is required during the next scheduled visit to the machine.

☒

LOW: Action is required if machine is exhibiting the reported issue.

☐

GENERAL: No action is required

SYMPTOM:

This document lists alarms and fault codes for battery charger 56122805. Note that not all codes will be displayed on chargers the charger's user interface.

Battery charger 56122805 is manufactured by Delta-Q technologies, model IC0650-024-COMM.

PRODUCTS:

- All SC50 models: 56104502, 56104503, 56104506, 56104507, 56104508, 56104509, 56394519, 561394521, 56394600, and 56394601.
- SC1500 and SA40 models with on-board charger.
- SC750 and SC800 with on-board charger.
- Focus II with on-board charger.
- Focus II rider with on-board charger.

SYSTEM:

Electrical system.

RELATED TFR / PRIOR TSB:

None.

ISSUE:

Guide for alarms and fault codes for battery charger 56122805.

CAUSE:

Not documented.



Nilfisk

TECHNICAL SERVICE BULLETIN

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GENERAL: No action is required

PRODUCTION CORRECTIVE ACTION

Not applicable.

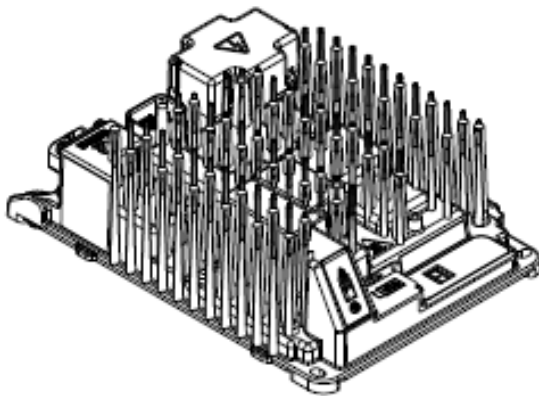
PRODUCTION SOLUTION IMPLEMENTATION DATE and / or SERIAL NUMBER:

Not applicable.

FIELD CORRECTIVE ACTIONS

No field corrective actions at the moment.

See images below for 56122805 charger image and data tag location.



SPAREPARTS and/or SERVICE KITS

Not applicable.

ECO / ODM / ECN #:

Not applicable.

Alarm and Fault Codes - IC/RC/ICL Series

Updated: 30-Apr-20

This document lists fault (Fxxx) and error (Exxx) codes on these chargers. Most of these will be reported over CAN and logged. Not all will be displayed on chargers with a user interface. If a unit is not functioning and nothing is indicated or logged, check and cycle both AC and DC. If this condition persists, replace the charger.

Type	Code	Description	Troubleshooting and/or Recommended Actions
Alarm	E001	High Battery Voltage Error	Battery Voltage is too high to start charge. Check the battery voltage and cable connections. Check battery size and condition. This error will automatically clear once the condition has been corrected.
Alarm	E002	Low Battery Voltage Error	Battery Voltage is too low to start charge. Check the battery voltage and cable connections. Check battery size and condition. This error will automatically clear once the condition has been corrected.
Alarm	E003	Charge Timeout	Charge Timeout caused by battery pack not reaching required voltage within safe time limit. Possible causes: Charger output reduced due to high temperatures or low AC voltage. Poor battery health. Very deeply discharged battery. Poorly connected battery. Extra loads. Battery too large for algorithm selected. Possible solutions: Improve cooling air flow. Check for low AC voltage. Replace battery pack. Check DC connections. This error will automatically clear once the charger is reset by cycling DC.
Alarm	E004	Battery Defective	Battery could not be trickle charged up to the minimum voltage. Check for shorted or damaged cells. Check battery pack voltage matches charger voltage. Replace battery pack. Check DC connections. This error will automatically clear once the charger is reset by cycling DC.
Alarm	E005	Algorithm Specific Alarm	Contact Support for details if this alarm occurs.
Alarm	E006	Battery Temperature Sensor Short Circuit	Check temperature sensor wiring for short to ground then restart the charge.
Alarm	E007	Charge Amp-Hour Limit Exceeded	Safety limit exceeded. Possible causes: Poor battery health. Very deeply discharged battery. Poorly connected battery. High parasitic loads on battery while charging. Possible solutions: Replace battery pack. Check DC connections. Disconnect parasitic loads. This error will automatically clear once the charger is reset by cycling DC.
Alarm	E008	Battery Temperature Out of Range	Possible battery temperature sensor error. Check temperature sensor and connections. Reset charger. This error will automatically clear once the condition has been corrected.
Alarm	E009	Battery Temperature Changing Too Quickly	Check loose/corrosion on output cable or bad configuration if the battery temperature sensor is used for charge control.
Alarm	E010	Charger Output Short Circuit	Charger DC terminals in contact with each other while charging. Check for short circuit in charging and battery cables.
Alarm	E011	Charger Disabled By External Command	Charger has been disabled by an external controller over the CANbus network. This error is logged in the data log and the charger sends out a CAN message. It is not displayed.
Alarm	E012	Charger Output Reverse Polarity	Battery is connected incorrectly. Check the battery connections. This error will automatically clear once the condition has been corrected.
Alarm	E013	Charger Output Current Not Accepted	Battery voltage is detected but the charger is unable to output current. This is normally caused by an electrical device connected between the charger and the battery which passes through voltage but not current. Poor connections can also cause this. Ensure the charger is properly connected to approved equipment. This error will automatically clear once the charger is reset by cycling DC or AC.
Alarm	E014	Configuration Error - Charger Cannot Support Number of Battery Cells	The charger will need to be reflashed to the correct settings.
Alarm	E015	Configuration Error - Algorithm Does Not Support Target Voltage Scaling	The charger will need to be reflashed to the correct settings.
Alarm	E016	Charger Programming Failure - General	Retry by removing and re-inserting the USB drive. Ensure correct files are being used. Ensure the USB Flash Drive is properly formatted (FAT recommended) and retry. Try a different USB drive. If error persists, contact Support.
Alarm	E017	USB Operation Failure	This could be caused by a faulty USB drive or connections. If it persists, try a different USB drive.
Alarm	E018	Charger Programming Failure - Corruption	Retry by removing and re-inserting the USB drive. Ensure correct files are being used. Ensure the USB Flash Drive is properly formatted (FAT recommended) and retry. Try a different USB drive. If error persists, contact Support.

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Type	Code	Description	Troubleshooting and/or Recommended Actions
Alarm	E019	Charger Programming Failure - Incorrect Software	The charger hardware does not support the software version being programmed. Existing software is left running. Contact Support.
Alarm	E020	No Active Algorithm Selected	Select a charge profile using the button or reflash the charger.
Alarm	E021	High Battery Voltage Error While Charging	Battery Voltage is too high as detected by the algorithm. Check the battery voltage and cable connections. This error will automatically clear once the condition has been corrected.
Alarm	E022	Low Battery Voltage Error While Charging	Battery Voltage is too low as detected by the algorithm. Check the battery voltage and cable connections. This error will automatically clear once the condition has been corrected.
Alarm	E023	AC Voltage High	AC voltage is too high. Connect charger to an AC source that provides stable AC between 85 - 270 VAC / 45-65 Hz. This error will automatically clear once the condition has been corrected.
Alarm	E024	Charger Initialization Failure	The charger has failed to turn on properly. Disconnect AC and battery for 30 seconds before retrying. If Error persists, contact Support.
Alarm	E025	AC Voltage Unstable and Low	AC source is unstable. Could be caused by undersized generator and/or severely undersized/long AC cables. Connect charger to an AC source that is stable and between 85 - 270 VAC / 45-65 Hz. This error will automatically clear once the condition has been corrected.
Alarm	E026	USB Script Failure	Retry by removing and re-inserting the USB drive. Ensure correct files are being used. Ensure the USB Flash Drive is properly formatted (FAT recommended) and retry. Try a different USB drive. If error persists, contact Support.
Alarm	E027	USB Over Current Fault	USB hardware overcurrent protection has been tripped. Remove and reinsert USB device. If the condition persists then try a different, brand-name USB device.
Alarm	E028	Incompatible Algorithm	The selected charging profile is incompatible with the charger software. Update charger software or select a different charging profile.
Alarm	E029	CAN Bus Physical Layer Error	CAN bus network error. Check the physical CAN connector, wiring, and other CAN modules for correct functioning. Check termination is around 60 ohms.
Alarm	E030	Battery Reporting Error	Charger has received an error from the battery module or it is in a pre-operational state.
Alarm	E031	Internal Charger Power Supply Error	Internal supply rail error detected. Remove AC and battery for minimum 30 seconds and retry charger. If the problem persists contact Support.
Alarm	E032	Missing CAN Messages	CAN heartbeats or PDOs were received and then timed out. Check other CAN devices for function.
Alarm	E033	Configuration Error - Target Voltage Too High	The charger configuration is asking for more voltage than the charger can deliver. Charger reflash is required to correct this issue.
Alarm	E034	Configuration Error - Battery Capacity Not Supported	Charger is configured to with capacity scaling but algorithm selected does not support this feature. Select a scalable algorithm or reflash the charger.
Alarm	E035	Configuration Error - Target Voltage Too Low	The charger configuration is asking for voltage below 20% of the charger nominal. Charger reflash is required to correct this issue.

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Type	Code	Description	Troubleshooting and/or Recommended Actions
Alarm	E036	Battery Temperature Open Circuit	Check if sensor is connected correctly. Install a temperature sensor. Change to an algorithm that does not require a temperature sensor.
Alarm	E037	Charger Programming Failure - CAN	Re-try CANOpen download or re-program using the USB
Alarm	E038	Cooling Fan Error	Inspect fan to make sure the power wires are connected and the fan blades are not obstructed by debris.
Alarm	E039	Button Stuck Down	Inspect for objects on or near the button or damage to the button. If alarm persists, replace charger.
Alarm	E040	Cooling Fan Voltage Too Low	Ensure that the fan is not stuck or drawing excess current, and that the correct fan part is installed.
Alarm	E041	Software Error - General	Software internal configuration error, ensure configuration settings are correct and reflash charger
Alarm	E042	Configuration Error - CAN	Software internal configuration error, ensure configuration settings are correct and reflash charger
Alarm	E043	CANopen PDO CRC Mismatch	Power cycle all CAN nodes and charger. Error will clear once sequence counter updates. Reflash charger if this persists. CAN only - not shown on display
Alarm	E044	CANopen PDO Sequence Count Not Changing	Power cycle all CAN nodes and charger. Error will clear once sequence counter updates. Reflash charger if this persists. CAN only - not shown on display
Alarm	E045	Charger Output Open Circuit	Charger did not see enough battery voltage. Connect the battery in order to start charging. This alarm is only displayed if configured.
Alarm	E046	CAN - Invalid PDO Length	Power cycle all CAN nodes and charger. Error will clear once sequence counter updates. Reflash charger if this persists.
Alarm	E047	Reserved for internal use	
Alarm	E048	Stackable Charging - Multiple Masters	Check the wiring harness to ensure only one charger has pins populated to be parallel charging master.
Alarm	E049	Stackable Charging - More Secondary Chargers Than Expected	Make sure the right number of chargers are on the bus for this fixed configuration. Reset chargers to check if this alarm persists.
Alarm	E050	Stackable Charging - Single Charger Detected Stackable Messages	Check the configuration of all chargers that are sharing this bus.
Alarm	E051	Stackable Charging - No Master	Master device may be disconnected or powered down. Check wiring harness. Check configuration of devices. Reflash Master charger
Alarm	E052	Stackable Charging - Fewer Secondary Chargers Than Expected	Secondary chargers may be disconnected or powered down. Check the wiring and power to the secondary chargers. The alarm will automatically clear when the missing chargers come back online.
Alarm	E053	Stackable Charging - Communications Lost With Secondary Charger(s)	Check wiring harness and power to secondary chargers. Check to see if Secondary Chargers are issuing faults of their own.
Alarm	E054	Stackable Charging - Secondary Charger Reverse Polarity	Check the DC connections of all chargers and the battery.
Alarm	E055	Stackable Charging - Secondary Charger DC Voltage Mismatch	Either they are disconnected from each other or there is an excessive series resistance which may result in cable overheating. Check DC output wiring of the entire stack. The problem might be due to loose or corroded connections in the cabling.
Alarm	E056	Stackable Charging - Secondary Charger Fault or Alarm	Check for alarms and faults reported by the secondary chargers.
Alarm	E057	Reserved - Customer specific implementation	
Alarm	E058	Reserved - Customer specific implementation	
Alarm	E059	J1939 Address Conflict	Investigate and disconnect non-compliant device from the bus. Alternatively change the charger's configuration to exclude the conflicted address from its allowed range of addresses.
Alarm	E060	CAN Communications Never Received	Charger is waiting for this message to start. Check CAN cabling. Ensure nodes configured to send expected messages

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Type	Code	Description	Troubleshooting and/or Recommended Actions
Alarm	E061	CAN Battery Current Report Mismatch	The charger compares the Battery written current with its output current. Check that the right current is being sent to the charger. Check if the output cable has a parallel branch.
Alarm	E062	CAN Battery Voltage Report Mismatch	The charger compares the Battery written voltage with its output voltage. Check that the correct voltage is being sent to the charger. Check that the output cable resistance matches the charger setting. Check for other sources of voltage drop.
Alarm	E063	Stackable Charging - Incompatible Secondary Charger(s)	Query the master to identify which secondary has the bad configuration or interface version.
Alarm	E064	J1939 Address - Charger Failed to Claim	The most likely cause of this problem is that two or more chargers, configured for the same fixed address, have been connected to the same bus in error. Alternatively there could be a configuration issue and the addresses available to the charger are already being used by other customer devices on the bus.
Alarm	E065	J1939 Address - Other Device Failed to Claim	Read SPN 611 from the charger(s) that has raised this alarm. This will contain the 64-bit J1939 "Name" of the device that could not claim its address (see J1939-81 Network Management, Feb 2016, Section 4.2.1). If this device is another Delta-Q charger (manufacturer code 800, function Id 141) and this is a stackable charging system then possible causes include: i) Incorrectly configured chargers ii) Address conflicts exist between the charger and other devices on the bus iii) Master/Secondary wiring fault. The alarm will be cleared on charger reset - but may immediately trigger if the address conflict persists.
Alarm	E066	Battery Voltage Higher Than Configured Maximum	Check if the charger is connected to the right battery, or the maximum voltage configured is too low.
Alarm	E067	CAN Physical Layer Error - Before Messages Received	CANbus network error. Check the physical CAN connector, electrical bus conditions and other CAN modules for correct functioning. For example check termination resistance is approx 60ohms.
Alarm	E068	Missing CAN Messages While Not Charging	Monitored messages (Heartbeat, PGN, PDO) lost while charger output off. Check the networked CANbus device(s) for correct function and messages.
Fault	F001	DC-DC Circuit Excessive Leakage	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F002	PFC Circuit Excessive Leakage	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F003	PFC Circuit Boost Failure	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F004	Battery Current Sense Circuit Failure	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F005	DC Relay Circuit - Rationality	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F006	Battery Current Sense Circuit Rationality	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F007	DC-DC Circuit Failure	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F008	Not Used	
Fault	F009	Internal Software Exception	Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, do not continue to use the charger - replace the unit.
Fault	F010	Fault on Connected Charger	Stackable and VCIM systems: Check connected chargers individually for faults.