



Delta-Q IC Series

User Manual: Important Safety and Operating Instructions

Save these instructions. This manual contains important safety and operating instructions for the Delta-Q IC Series Industrial Battery Charger. Read this information in its entirety before using your Delta-Q Charger. For technical support, please contact the manufacturer or distributor of your vehicle or machine, as their version of this charger may require unique operating instructions. For additional product documentation please see www.delta-q.com/resources

Instructions importantes concernant la sécurité

Conserver ces instructions. Ce manuel contient des instructions importantes concernant la sécurité et le fonctionnement.



Warning

Only use the charger with a charging profile that is appropriate to the specific battery type. Other usage may cause personal injury and damage. Lead acid batteries may generate explosive hydrogen gas during normal charging. Keep sparks, flames, and smoking materials away from batteries. Do not operate charger in a closed-in area or an area with restricted ventilation. Never charge a frozen or non-rechargeable battery. Observe all battery manufacturers' precautions (e.g. maximum charge rates and if cell caps should be removed while charging).



Danger

Risk of electric shock. Connect charger power cord to an AC outlet that has been properly installed and grounded in accordance with all local codes and ordinances. A grounded AC outlet is required to reduce the risk of electric shock—do not use ground adapters or modify the plug. Do not touch uninsulated portions of the output connector or uninsulated battery terminals. Disconnect the AC supply before making or breaking the connections to the battery. Do not open or disassemble the charger. Do not operate this charger if the AC supply cord or DC output cord is damaged or if the charger has received a sharp blow, been dropped, or is damaged in any way. Refer all repair work to the manufacturer, or qualified personnel. This charger is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge on electrical systems and battery charging, unless they have been given supervision or instruction concerning use of the charger by a person responsible for their safety. Children should be supervised to ensure they do not play with the charger.



Attention

Utiliser le chargeur seulement avec un algorithme approprié au type et capacité spécifique de batterie. D'autres types de batteries pourraient éclater et causer des blessures ou dommages. Les batteries peuvent produire des gaz explosifs en service normal. Ne jamais fumer près de la batterie et éviter toute étincelle ou flamme nue à proximité des batteries. Fournissez une ventilation adéquate du chargement. Ne jamais charger une batterie gelée. Prendre connaissance des mesures de précaution spécifiées par le fabricant de la batterie, p. ex., vérifier s'il faut enlever les bouchons des cellules lors du chargement, et les taux de chargement.



Danger

Risque de décharge électrique. Ne pas toucher les parties non isolées du connecteur de sortie ou les bornes non isolées de la batterie. Toujours connecter le chargeur à une prise de courant mise à la terre. Déconnectez la source AC avant de faire ou défaire les connexions à la batterie en chargement. Ne pas utiliser le chargeur si le cordon d'alimentation AC est endommagé ou si le chargeur est abîmé suite à une chute ou autre incident. Ne pas ouvrir ni désassembler le chargeur – référer toute réparation aux personnes qualifiées. Cet appareil n'est pas destiné à un usage par des personnes (dont les enfants) avec des facultés motrices, sensorielles ou mentales réduites, ou ayant une expérience et des connaissances insuffisantes, à moins qu'elles sont sous la supervision ou reçoivent les instructions sur l'utilisation de l'appareil d'un répondant garant de leur sécurité. Les enfants devraient être surveillés afin qu'il ne jouent en aucun temps avec l'appareil.

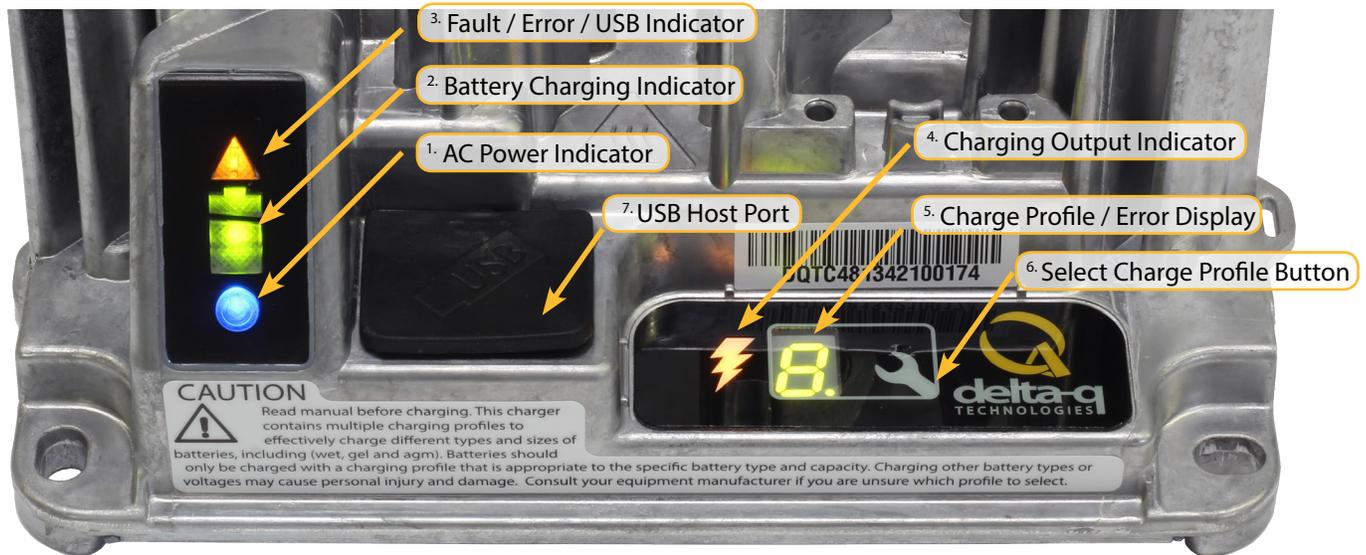
Safe Operating Instructions

- ✦ The charger contains up to 25 selectable charging profiles stored in its internal memory to charge batteries. These profiles are specific to each manufacturer and model of battery. Your equipment supplier or charger distributor is responsible for ensuring the active charge profile matches the battery pack charging requirements. Contact them with any questions about which profile to select for each battery pack.
- ✦ The charger may become hot during charging. Use hand protection to safely handle the charger during charging.
- ✦ To maintain safe operations, the unit automatically reduces its output power if the temperature rises above set thresholds, or if the AC input voltage is too low. The charger will also reduce output power if it detects that the battery pack is damaged.
- ✦ If power is interrupted, and then returns, the charger will start and continue to operate without hazard to the user, or damage to the batteries.
- ✦ Unplug the charger from both AC and DC sources when cleaning, moving or conducting any maintenance or repair on the charger. No user serviceable parts inside. Do not remove the cover due to the risk of electrical shock.
- ✦ Do not expose charger to oil, dirt, mud or direct heavy water spray when cleaning the vehicle or machine.
- ✦ If the detachable AC input power cord set or DC output cord is damaged, do not use the charger until they are replaced with cord sets appropriate to your region and application.
- ✦ When mated with a Delta-Q sealed AC cord, the charger meets IP66 specifications, making it dust-tight and protected against powerful water jets. If a cord set with an unsealed connector is used, the plug and connector must be periodically inspected to ensure the contacts are clean and dry.
 - ✦ If this charger is provided with an AC cord set and the power plug does not match the power outlet, contact the equipment manufacturer, distributor or Delta-Q Technologies for the correct AC cord set terminating with a 3-prong plug suitable for your regions' grounded power outlet.
 - ✦ In North America (and other 120V AC regions), the AC cord must be a 3 conductor UL Listed/CSA approved detachable cord set at least 1.8m in length (≥ 6 feet), minimum 16AWG and rated SJT; terminated with 250V, 13A or greater connector.
 - ✦ In Japan, the AC cord must be a 3 conductor PSE approved detachable AC cord set terminated with 100V, 15A or greater connector.
 - ✦ In 220-240VAC regions the AC cord must be a 3-conductor safety-approved cord set, with 1.5mm² conductors(min.), rated appropriately for industrial use. The cord must be terminated on one end with a grounding type input plug appropriate for use in the country of destination and both plug and connector should be rated 250V, 10A or greater.
- ✦ Extension cords must be 3-wire cord no longer than 30m (100') at 10 AWG or 7.5m (25') at 16 AWG, per UL guidelines.



Only use compatible IEC320 C13 cables, as shown above

Getting to Know Your Delta-Q IC Series Battery Charger



1. When you first plug your charger into AC power, the AC Power Indicator will light solid blue to indicate AC power is present.

 Solid blue = AC power available

2. The Battery Charging Indicator has 4 states as indicated here.

 Flashing green = Low state of charge
 Solid green = High state of charge
 Flashing green = High state of charge
 Solid green = Charge completed

3. The Fault / Error / USB Indicator will indicate faults, errors, and USB activity as indicated below. See the Error Display for the code and find the error description in the Charger Error and Fault Codes Table.

 Solid red = Charger fault
 See display panel for details
 Flashing amber = External error condition - caution
 See display panel for details
 Flashing green = USB port active
 Solid green = Safe to remove USB flash drive

4. The Charging Output Indicator means that the charger output is active, and there is a potential risk of electric shock.
5. The Charge Profile / Error Display shows one of four possible codes to indicate different conditions:
 - ✦ 'F' codes; a condition has caused charging to stop. Re-insert AC power to reset the charger to clear the error.
 - ✦ 'E' code; an error condition has caused charging to stop. Re-insert AC power to reset the charger to clear the error.
 - ✦ 'P' code; the charger profile selection is active.
 - ✦ 'USB' code; the USB interface is active, and the USB flash drive should not be removed.

When the 'E', 'F' and 'P' codes appear, the letter is followed by three numbers and a period to indicate different conditions (e.g. E-0-0-4). See the "Charger Fault Codes" or "Charger Error Codes" sections for details on these conditions and its solution.

6. The Select Charge Profile Button is used to select a charge profile from the profiles that are stored on the charger. Up to 25 charge profiles can be stored. See the "Selecting A Charge Profile" section for instructions.
7. The USB Host Port allows data to be transferred to and from the charger using a standard USB flash drive, including the downloading of charge tracking data and updating of the charger's software and / or charge profiles.

Charging Profiles

The IC Series charger contains up to 25 selectable charging profiles stored in its internal memory to charge batteries. These profiles are specific to each manufacturer and model of battery. Your equipment supplier or charger distributor is responsible for ensuring the active charge profile matches the battery pack charging requirements. Contact them with any questions about the default profile, the other profiles on the charger, and which profile to select for each battery pack.

Selecting A Charge Profile



1. Disconnect AC input from the charger, or from the wall outlet. Wait 30 seconds for the input relay to open.



2. While reconnecting AC input, press and hold the Select Charge Profile Button. Hold the button (approximately 10 seconds) through the light check function until Error Indicator is on (in amber) and Battery Charging Indicator (in green) starts flashing.



3. Press and release the Select Charge Profile Button to advance through the charge profiles. The selected charging profile will be displayed up to three times (e.g. "P-0-1-1" for Profile 11).*

* Process will time out and profile will remain unchanged if there is 15 seconds of inactivity, a profile number is allowed to display three times, or if AC power is cycled.

4. Once the desired charging profile is displayed, press and hold the Select Charge Profile button for 10 seconds to confirm selection and exit from Profile Selection Mode. When the charge profile is confirmed, the Error Indicator and Battery Charging Indicator lights will turn off, while the blue AC Power Indicator stays lit. At this point, the button can be released.
5. Press the Select Charge Profile Button to check that the desired profile has been selected.

In some circumstances, the charging profile output will be altered, to maintain safe operations. The unit automatically reduces its output power if the temperature rises above set thresholds, or if the AC input voltage is too low. The charger will also reduce output power if it detects that the battery pack is damaged. If power is interrupted, and then returns, the charger will start and continue to operate without hazard to the user, or damage to the batteries.

Identifying Charger Serial Number

The charger's serial number is printed on the front of the charger. This is the number to provide when requesting technical support.



Charger Error & Fault Codes Table

Code	Description	Solution
E-0-0-1 E-0-2-1	Battery high voltage	Possible causes: wrong battery voltage for charger, other charger also attached, resistive battery. Possible solutions: check the battery voltage and cable connections. Check battery size and condition. This error will automatically clear once the voltage is in range.
E-0-0-2 E-0-2-2	Battery low voltage	Possible causes: battery disconnected, battery overdischarged. Possible solutions: check the battery voltage and cable connections. Check battery size and condition. This error will automatically clear once the voltage is in range.
E-0-0-3	Charge timeout caused by battery pack not reaching required voltage within safe time limit. (charge profile dependent)	Possible causes: charger output reduced due to high temperatures, poor battery health, very deeply discharged battery and /or poorly connected battery. Possible solutions: operate at lower ambient temperature. Replace battery pack. Check DC connections. This error will clear once the charger is reset by cycling DC or AC.
E-0-0-4	Battery could not meet minimum voltage (charge profile dependent)	Possible causes: check for shorted or damaged cells. Possible solutions: replace battery pack. Check DC connections. This error will automatically clear once the charger is reset by cycling DC or AC.
E-0-0-7	Battery amp hour limit exceeded	Possible causes: poor battery health, very deeply discharged battery, poorly connected battery, and / or 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 or AC.
E-0-0-8	Battery temperature is out of range	Possible battery temperature sensor error. Check temperature sensor and connections. Reset charger. This error will clear once the condition has been corrected.
E-0-1-2	Reverse polarity error	Battery is connected to the charger incorrectly. Check the battery connections. This error will clear once the condition has been corrected.
E-0-1-6 E-0-1-8 E-0-2-6	USB operation failed (software)	Software upgrade failure or script operation failure. Ensure the USB flash drive is properly formatted and reinsert the USB flash drive.
E-0-1-7	USB operation failed (hardware)	Remove and reinsert the USB drive. If condition persists, cycle AC and retry by reinserting the USB drive.
E-0-2-3	High AC voltage error (>270VAC)	Connect charger to an AC source that provides stable AC between 85 - 270 VAC / 45-65 Hz. This error will clear once the condition has been corrected.
E-0-2-4	Charger failed to initialize	The charger has failed to turn on properly. Disconnect AC input and battery for 30 seconds before retrying.
E-0-2-5	Low AC voltage oscillation error	AC source is unstable. Could be caused by undersized generator and /or severely undersized input cables. Connect charger to an AC source that provides stable AC between 85 - 270 VAC / 45-65 Hz. This error will clear once the condition has been corrected.
F-0-0-1, F-0-0-2 F-0-0-3, F-0-0-4 F-0-0-6		Internal charger fault. Remove AC and battery for minimum 30 seconds and retry charger. If it fails again, please contact the manufacturer of your vehicle or machine.

This is a Class A product complying with United States Federal Communications Commission, Code of Federal Regulations; 47CFR part 15. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.