MULTI-TAP AC INPUT VOLTAGE CHANGE

BACKGROUND

AT10.1 Group II (single phase @ 30-100 Adc) battery chargers are normally factory-built to a ***single***, specific ac input voltage. This is different from the smaller Group I (1PH @ 6-25Adc) models, which can feature a 120/208/240 Vac multi-tap. For a proper input voltage change, it is always ***best*** to return an AT10.1 charger to the manufacturing facility for rework and retest.

On occasion, an installed unit has to be connected either to a temporary line, or to a different ac input voltage source than what was ordered. The conversion, done outside the factory, often requires changing certain components, and rewiring of other components, before it can be used with a different ac input voltage source.

NOTICE All AT10.1 Power Isolation Transformers (T1) are designed to operate with an ac input voltage ***tolerance*** of **+10%** to **-12%**.

REFERENCE DOCUMENTATION

1) AT10.1 Group II battery charger ***Operating and Service Instructions*** (**JA0102-02**)
2) AT10.1 Group II standard drawings, featured online (**http://www.ATSeries.net/**)

MATERIALS REQUIRED

Conversion Kit will contain:

1) a new data nameplate decal (p/n FK5007-00) listing the new ac input voltage and current

Conversion Kit may contain:

1) ac input circuit breaker (CB1)
2) power isolation transformer (T1)
3) ac input surge suppressors (VR2, VR4, VR5)
4) ac input power wire

Supplied by User:

1) crimp terminals (ring type preferred)
2) cable ties

TOOLS REQUIRED

1) standard hand tools
2) wire cutters, stripper and terminal crimping tool

ACCEPTABILITY

A) AT10.1 single phase 60Hz units (120, 208 or 240 Vac input) feature power isolation transformers (T1) that are typically designed with changeable taps.

B) AT10.1 single phase 50/60Hz units (220 or 240 Vac input) are supplied with a different transformer design, but features taps for those voltages as well.

C) Other ac input voltages are supplied with AT10.1 battery chargers, but may feature a transformer with ***no*** changeable taps (e.g. 480 Vac).

D) To determine if a particular AT10.1 Group II transformer (T1) features taps which can be rewired for a different ac input voltage than what was ordered, contact the manufacturing facility with a serial number and model number of the unit in question.

REQUIRED CHANGES

Refer to the matrix below to determine the scope of work required for a field-installed ac input voltage change. Consult the AT10.1 manufacturing factory for changes not shown.

ac input voltage change		new ac input breaker (CB1) required?	new isolation transformer (T1) required?	ac input wire change required?	new ac input surge suppressors (VR#) required?
60Hz	120 to (208 or 240)	***YES***	NO	NO	***YES***
60Hz	(208 or 240) to 120	***YES***	NO	***YES***	***YES***
50/60Hz	120 to (220 or 240)	***YES***	NO	NO	***YES***
50/60Hz	(220 or 240) to 120	***YES***	NO	***YES***	***YES***
60Hz	240 to 208 or 208 to 240	NO	NO	NO	NO
50/60Hz	240 to 220 or 220 to 240	NO	NO	NO	NO
60Hz	550 to 600, or 600 to 550	NO	NO	NO	NO
50/60Hz	380 to 416, or 416 to 380	NO	NO	NO	NO
	any voltage to 480	***YES***	***YES***	NO	***YES***
	480 to any voltage	***YES***	***YES***	***YES***	***YES***
	any voltage 60Hz to 50Hz	***YES***	***YES***	NO	NO

PREPARATION

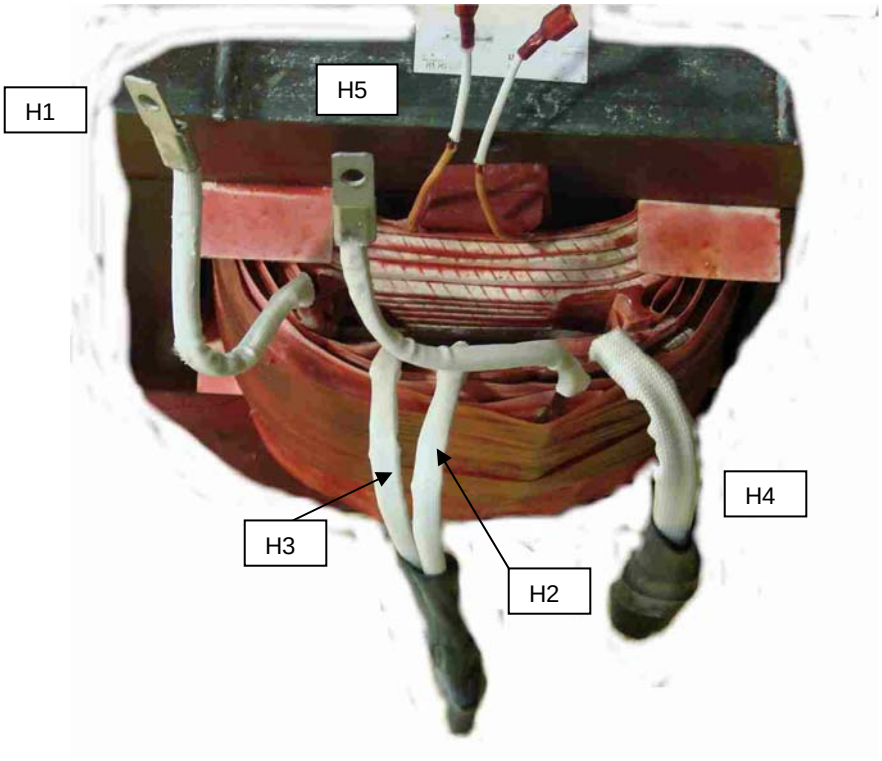
NOTICE ***Only qualified service technicians should perform this procedure. Follow all site and employer standard safety protocols.***

1. If you have successfully determined that the transformer (T1) can be rewired to the newly required ac input voltage, see the standard drawings located in Appendix C of the AT10.1 battery charger ***Operating and Service Instructions***.
2. Identify the AT10.1 Group II battery charger enclosure style, and refer to the corresponding internal component layout drawing.
3. Locate components of the ac input feature by their reference designators:
   - **CB1** ac input circuit breaker
   - **T1** power isolation transformer
   - **VR#** ac input surge suppressors (VR2, VR4 & VR5)
   - **TB1** input/output terminal block (TB1-L1/L2/GND to be accessed)
4. Shut down the AT10.1 per the unit's ***Operating and Service Instructions***.

   ⚠ **WARNING** ***Remove ALL ac power to the AT10.1, disconnect the batteries, and remove all signal contacts. Any optional filter capacitors (C1/C2) inside the charger store powerful electrical potential. Wait several minutes, then test for zero voltage at I/O panel (TB1) and capacitors (C1/C2).***
5. Open the front panel door of the AT10.1 and remove the Plexiglas safety shield.
6. Identify the corresponding physical components (CB1/T1/VR#/TB1) inside the actual unit.

PROCEDURE (re-tap)

1. The image below depicts the wires (taps) coming out of the face of the coil, in a 120/208/240 60Hz transformer (T1).



   It shows the transformer (T1) connection set up for 240Vac input. The wires from the ac input circuit breaker (CB1) will be going to H1 and H5.

2. To change to a 120V input, cut the heat shrink off of H3/H2 and separate the wires.
3. Connect the H3 lead together with H1, and connect the H2 lead to H5. The input wires from the breaker stay at H1 and H5 also. The current flowing into the transformer (T1) is now ***doubled***, so the wires that run from TB1-L1/L2, through CB1, and to the transformer may need to be increased in size along with a larger circuit breaker.
4. For an input change from 120Vac to 240Vac, rearrange T1 so that is as shown in the picture above. The ac breaker (CB1) will need to be changed, but the ac wiring is large enough as supplied from the factory.
5. To rewire the transformer from 240 to either 208 or 220, break the H2 and H3 connection, and connect H2 to H4. H3 will have no connection.
6. Sleeve both remaining leads so they do not touch to any other connection or chassis.
7. Replace the ac input circuit breaker (CB1) if a new one is supplied and/or it is required per the table on page 2.
8. Replace the ac input surge suppressors (VR2, VR4 & VR5) on the I/O panel board (TB1) if new ones are supplied and/or it is required per the table on page 2.
9. Once all transformer re-tapping, component replacement, and rewiring is complete, check all wiring to ensure it is correct, and that all connections are tight.

PROCEDURE (*optional* check)

1. Before powering back up the AT10.1, a check can be made to make ***sure*** the output of the transformer (T1) is correct.
2. Use static protection, and unplug the Main Control PC Board (A1) from the signal harness.
3. Apply the new ac voltage source to the AT10.1, and close the ac breaker (CB1).
4. Carefully measure voltage at the small wires (T1-Y1/Y2) coming out of the transformer coil. ***NOTICE*** These wires have slip-on lugs that may need to be separated. Be careful not to break wires.
5. If all new connections are correct, the voltage between Y1 to Y2 will be **9 Vac**. If there is no voltage at T1-Y1/Y2, then H2 and H3 may be switched.
6. Once you have confirmed **9 Vac** at Y1 to Y2, open the ac breaker (CB1) and re-attach the Main Control PC Board (A1) to end the check.

PROCEDURE (restart)

1. Remove the original AT10.1 data nameplate decal, and replace it with the new silver decal supplied with the conversion kit. This identifies the unit properly as connected to, and equipped for, the new ac input voltage source.
2. Reconnect the battery, dc loads, and ac power to the AT10.1.
3. Re-energize the AT10.1, by closing the dc output circuit breaker (CB2) ***first***, followed by the ac input circuit breaker (CB1) ***second***.
4. Your AT10.1 Group II battery charger has now been field-modified for a new ac input voltage source.