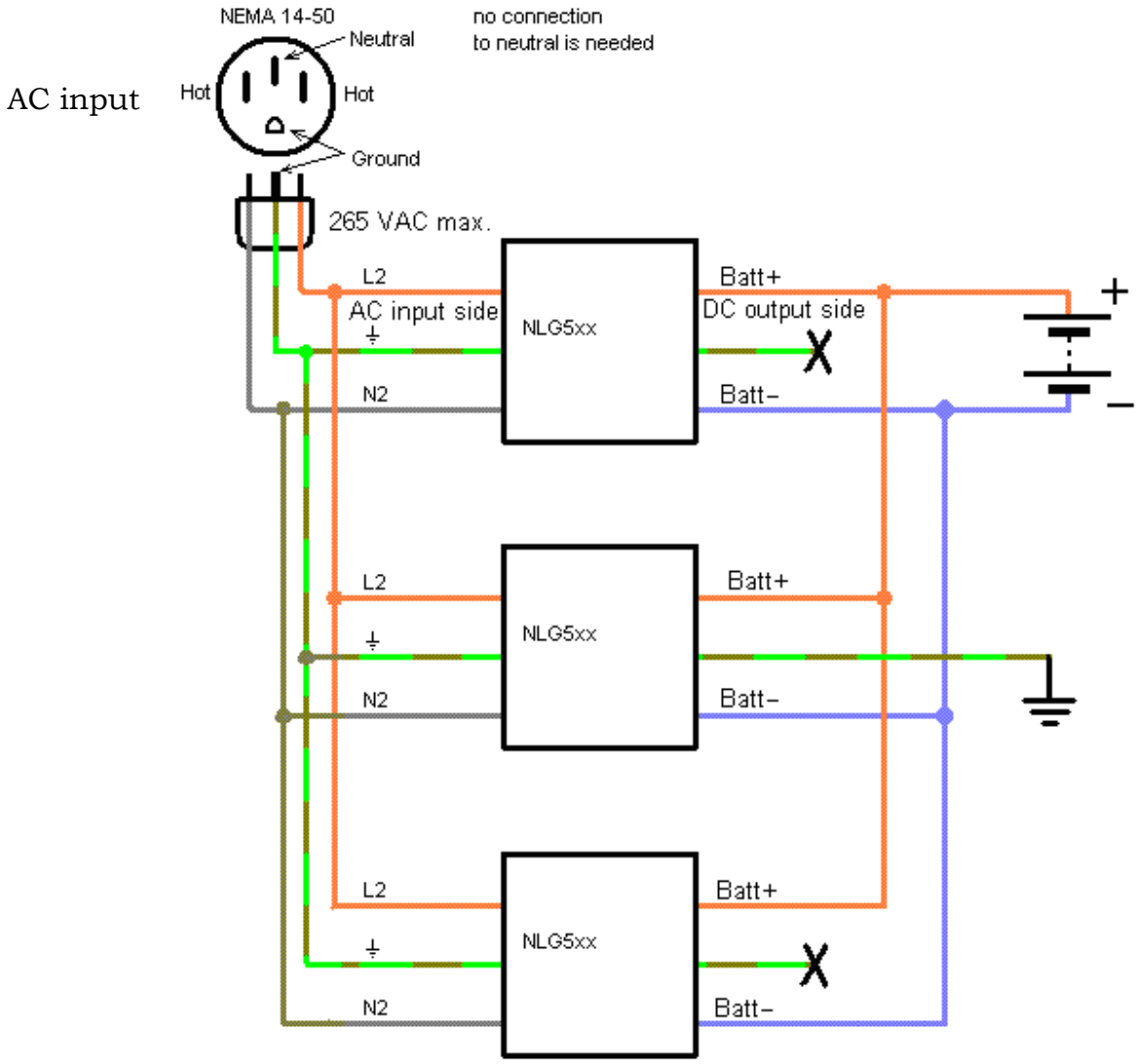
contact: Victor Tikhonov, MMC President/CTO +1-503-477-6071

METRIC MIND CORPORATION
EV POWER ELECTRONICS

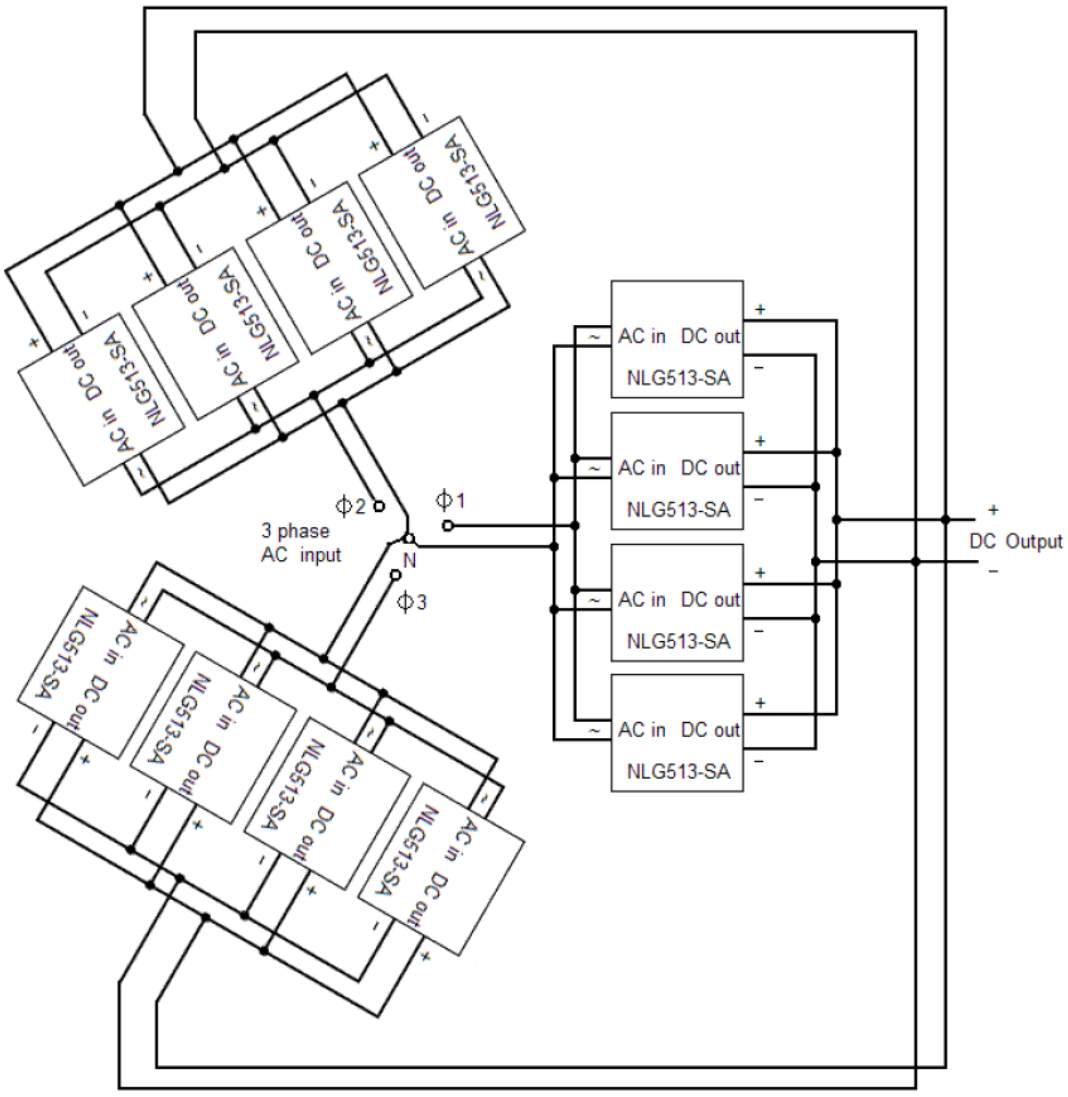
Parallel connection of BRUSA NLG5xx battery chargers



Two or more BRUSA NLG5xx chargers can be connected in parallel to increase total output power thus reducing recharging time. Connection is straight forward and depicted above. As far as chargers concerned, there is no limitation on how many can be paralleled; practical limitations are mains current handling capacity and cost. The array of 12 chargers arranged for 208VAC 3 phase feed is shown on page 2 (example of real life on-shore 40kW charging station for an electric boat).

http://www.metricmind.com
tech.support@metricmind.com
+1-503-477-6071

Metric Mind Corporation
10117 SE Sunnyside Rd,, Ste F1211
Clackamas, OR 97015 USA



In this particular instance chargers are connected to three phase feed in star configuration, but could as well be connected in delta configuration – this makes no difference in operation.

In case of automatic charging profile any one charger is dedicated for complete profile (I-U or I-U-I depending on the battery chemistry), and all other chargers provide bulk charging

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only. Normally all the chargers providing constant current during bulk charging are set up to finish I-U profile at slightly different voltages below required for your battery so they drop off one by one as you approach "U" phase. This is possible because after bulk charging is done, during execution of U-section of the profile charging current drops to the levels low enough to be supported by only one charger which completes the profile. Two or more chargers set up with equal voltage cut off in U-section would always interfere during voltage regulation, therefore this section should not be used in more than one charger.

After quick bulk charging is done, remaining charging time will not increase due to early drop off of chargers because only one charger completes U phase of charging profile in any case. During U-stage (constant voltage) stage of the charging a single charger can supply all the power the battery can accept anyway. So having more than one unit working in U-section would be of no benefit.

In case of CAN control the same principle applies – initially all chargers are commanded to output max. current and once constant voltage lever is reached, chargers are commanded zero output current leaving one charger commanded over CAN constant voltage output to complete the charging. For J1772 compliant applications use this charger to feed CP signal to, and based on its status read over CAN other chargers can be controlled. Granted, each charger has to be assigned unique CAN IDs for control messages - this is easily accomplished using supplied ChargeStar software.

WARNING: for any type of connection always observe precharging requirements for initial connection to the battery, see application note MMC_006 for details. Failure to precharge charger's output may cause hardware damage and is not covered by warranty.

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