



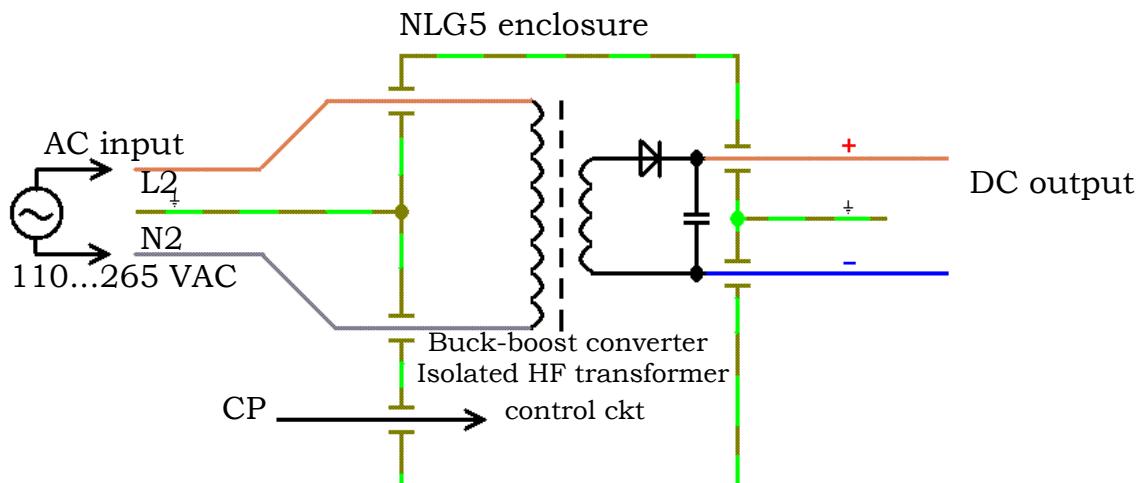
Application Note MMC_001

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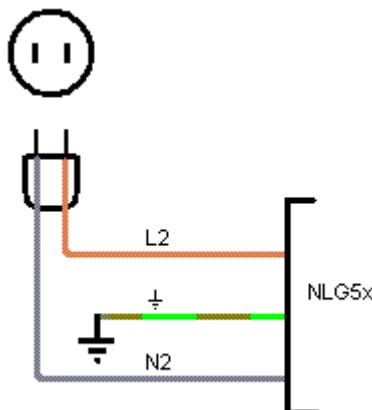
EV POWER ELECTRONICS

NLG5xx Connection and plugs for USA / Canada mains



The NLG5 series chargers require single phase 47...63 Hz 110...265VAC input voltage. For charger to work presence of input voltage lines L2 and N2 is all that's needed as far as mains feed. Charger metal enclosure has to be grounded for safety but this connection is not electrically required for charger to work. There is no internal connection between enclosure and either input or output.

L2 and N2 are functionally identical and can be swapped. "L" and "N" do not designate respectively "Line" and "Neutral".



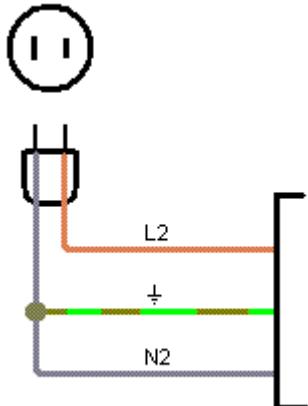
For single phase 2 prong non-polarized outlets (no longer common and up to the code in the USA) connection has to be made as depicted on the left. The charger will function as intended, but because there is no safety neutral line, such connection is not recommended. If you have to use this type of connection say for opportunity charging in rural area, make sure charger enclosure is reliably grounded to the vehicle chassis.



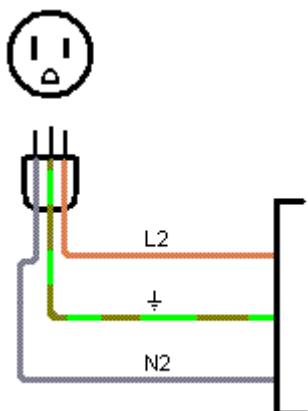
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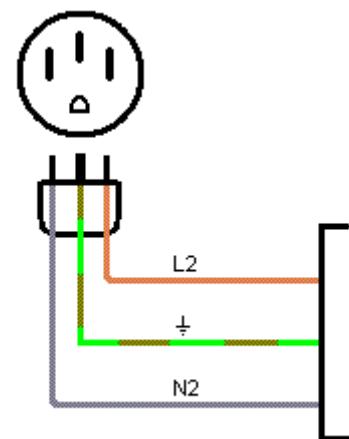
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In the USA single phase 2 prong polarized household outlets are designated as NEMA 1-15 (125VAC) and NEMA 2-30 (230 VAC). Narrow slot in the receptacle (and narrow blade of the plug) is electrically "hot" and wider slot and respective plug blade is neutral. For this type of receptacle it is advisable to connect charger enclosure to the neutral wire, this way the charger (and the vehicle) will end up grounded at the service panel where ground and neutral lines are typically joined together. Again, ground connection to the N2 line is not electrically required for the charger to function, it will work as long as voltage between L2 and N2 exists, but is recommended for safety.



The most common household receptacle in the USA is single phase 3 prong polarized outlets are designated as NEMA 5-15 and NEMA 5-50 (125VAC 15A and 50A respectively) and NEMA 6-50 (250 VAC 50A). As for NEMA 1-15, narrower slot and blade is electrically "hot" and wider slot and plug blade is neutral and for 125 VAC location of hot and neutral slots is the same as for 2 prong outlets - neutral on the left side and hot on the right side (ground prong on the bottom). For larger 250 VAC 50A outlets this is reversed - hot on the left and neutral on the right side. However for the charger it makes no difference as it can accept any of these voltages, therefore a custom plug made with both blades narrow will allow to plug the charger to either NEMA 5-50 or NEMA 6-50 outlets. As before, it is recommended to connect charger enclosure to the neutral prong of the outlet for safety.



The most common 2 phase high power outlet in the USA is NEMA 14-50 that has separate ground and neutral lines. Both right and left power prongs are electrically "hot" and are 180° out of phase thus 120VAC is present between each hot prong and neutral and 240VAC between hot prongs. The NLG5 does not require connection to the neutral, therefore connect L2 line to one hot prong, N2 line to another hot prong and charger enclosure to the ground (semi-round) prong. Leave neutral (central flat) prong unconnected.

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.