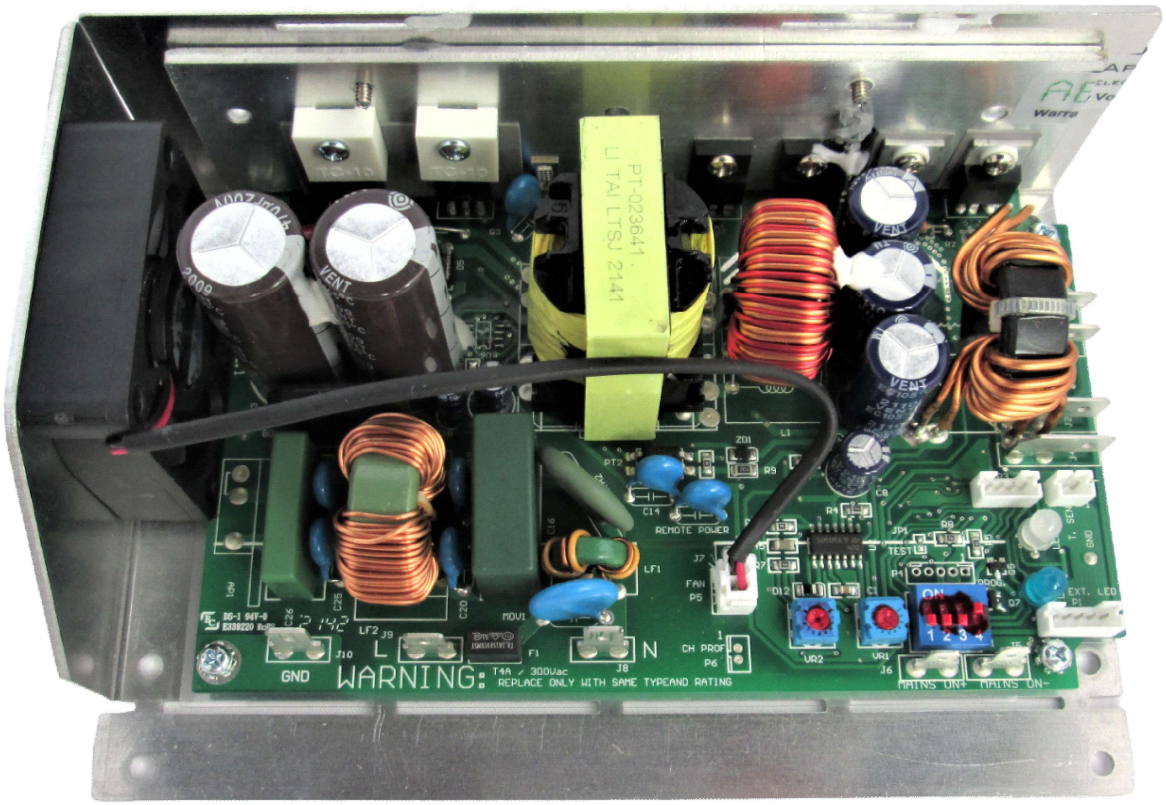
APULJACK
ELECTRONICS LTD
DESIGN AND REPAIR SPECIALISTS

CH360 – Intelligent 6-Stage Charger with Adaptive Charge Profile



Part Numbers: CHR-APU-003/004/005/006

1. Scope

These instructions relate to the Apuljack Electronics items - Model: CH360-OLXXX, Part number: CHR-APU-003/004/005/006

2. General description

The CH360-OLXXX is a 6-stage intelligent charger with fast charge characteristics suitable for 12V vehicle systems. It maintains long battery life due to intelligent charging features utilising microprocessor control to ensure high efficiency charging conditions via optimised current and voltage cycles.

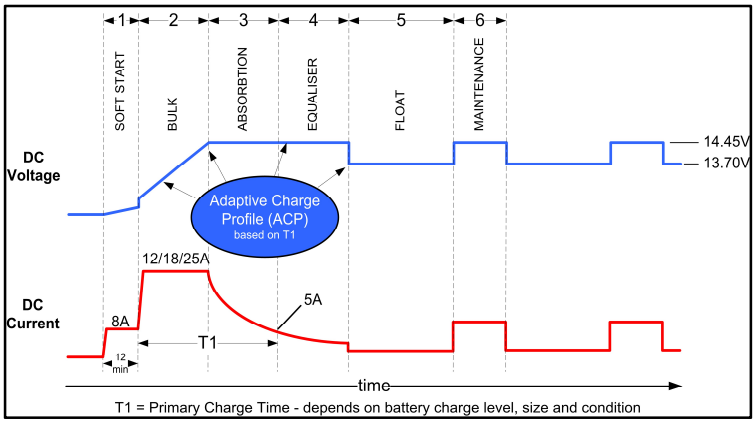
3. Safety & Warnings

Please observe the warnings on the charger label along with the items below.

- Under heavy loads the charger case may become hot.
- The internals of the charger contain lethal voltages – DO NOT TOUCH.
- Users should keep flames and sparks away from a charging battery due to possible presence of explosive gases.
- Users should provide adequate ventilation of the charger during operation.
- Users should disconnect the supply before making or breaking the connections to the battery or charger.

4. Charge Profile

The CH360 features the new 6-stage Adaptive Charge Profile (ACP) technology from Apuljack Electronics. This technology adjusts the Equaliser stage to suit the capacity and charge characteristics of the battery connected. The Bulk and Absorption phase times are measured by the charger and the ACP algorithm calculates the optimum equalisation time for that particular charge cycle. This helps to maximise the life of the battery. The unit uses a battery-sense start-up and will only start when a battery voltage of >4V is detected. This is to prevent damaging the unit by attaching it to degraded batteries.



- Stage 1: Soft Start – the charger gently begins charging at a maximum of 8A, this helps to protect very flat or damaged batteries. (**RED**/**GREEN** LED FLASH)
- Stage 2: Bulk – Output current limited to 12/18/20A - the charger adds most of the energy into the battery in this phase. (**RED** LED)
- Stage 3: Absorption – Output held at 14.45V – The final 10-20% of the charge is added to the battery. (**RED** LED)
- Stage 4: Equaliser – the ACP algorithm – the remaining charge is added and the individual cells are allowed to equalise. (**ORANGE** LED)
- Stage 5: Float – Output held at 13.7V – Battery full – held at this industry standard level to avoid excessive leakage. (**GREEN** LED)
- Stage 6: Maintenance – Output boosted to 14.45V – designed to reduce sulphation and top up charge if required. (**GREEN** LED)
- Whilst the ACP determines the overall length of the boost voltage, unlike other chargers which would remain at this voltage if a damaged battery were connected, the CH360 range has an intelligently controlled safety timer. This timer terminates the boost voltage after a 4 or 12 hour period (profile dependant) to protect your battery.

The **BLUE** LED indicates **POWER ON** if solid, or **OVER TEMPERATURE** if flashing, unit should be left to cool before attempt to use.

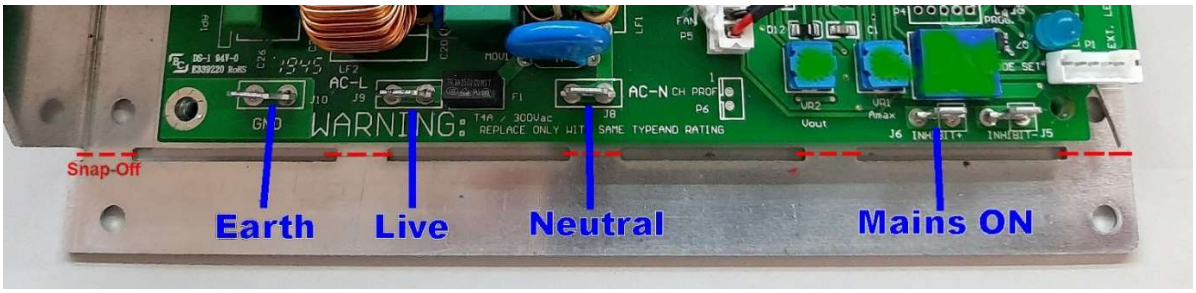
5. Inputs/Outputs

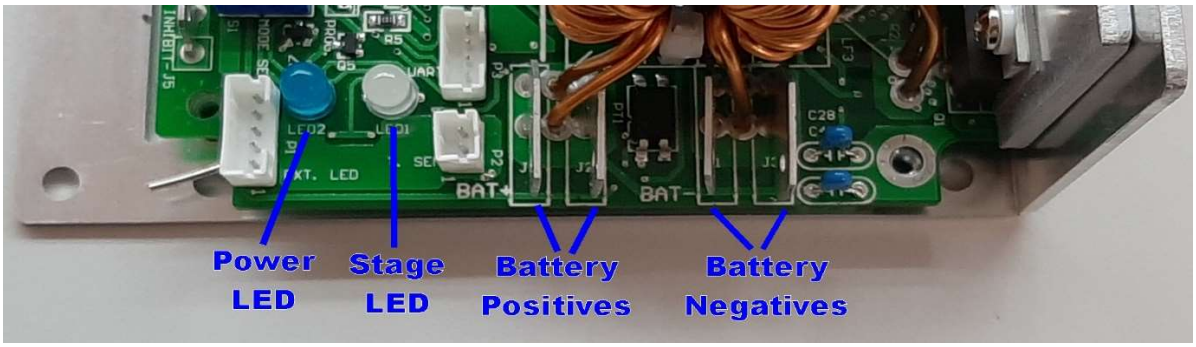
240V AC Mains input: connector type: 6.35mm Male Blade, L, N, PE

Charging output: connector type: 6.35mm Male Blade, 2 x positive 2 x negative

'Mains On' output: connector type: 4.8mm male blade.

The 'Mains on' output is used on some control panels to display a plug or electrical symbol to indicate when the vehicle is connected to the mains. If you do not have this feature/connection in your vehicle then the connector can be left unconnected. The operation of the charger is not affected if the 'Mains on' connector is not used.





6. Approvals & Certification

The charger is considered a component which will be installed into final equipment. Therefore EMC, safety and other certifications cannot be tested independently. Test results will be significantly affected by the application or assembly of the end system. It is the responsibility of the integrator to ensure that the end system complies with the regulations required. However, in order to enable customers' end systems to comply with EMC, safety and similar, APULJACK ELECTRONICS components are still designed to meet these requirements. For example, filtering components, galvanic isolation and earthing are incorporated into the component design. In the open frame format of the CH360 range the components are designed to meet EN55022, EN55024, EN55032, EN60335, IEC 61000-3 & -4.

7. Variants

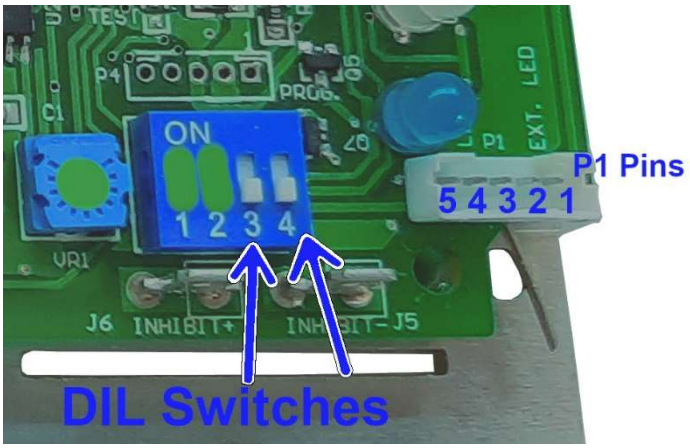
Product Code	Product Description	Part Code
CH360-OLA25	Open Frame 12V Lead Acid or AGM 12A output	CHR-APU-003-NE
CH360-OLA18	Open Frame 12V Lead Acid or AGM 18A output	CHR-APU-004-NE
CH360-OLA12	Open Frame 12V Lead Acid or AGM 25A output	CHR-APU-005-NE
CH360-OLT25	Open Frame 13.8V 18A fixed output	CHR-APU-006-NE
CH360-BLA25	Packaged 12V Lead Acid or AGM 25A output	TBC
CX360-DISP	Multifunction remote display	TBC

8. Technical specification

Input Voltage:	230V AC +/-15%, 196-264V AC
Input Frequency:	47Hz to 63Hz
Efficiency:	87%
Charge Output Current:	12A/18A/25A (model depending)
'Mains On' Output	12V with mains applied, 0V otherwise
Protection circuits:	Over-current, Short-circuit protection, Over-voltage protection, Thermal Protection, Battery Reverse Polarity
Operating Temperature:	-30°C to 55°C at full load
Cooling fan:	SMART: Temperature Controlled
Protection:	4A internal fuse (Type T)
Dimensions:	168 x 113 x 56 mm
Mounting Holes:	99 x 156 mm (82 x 156mm after snap-off removal)
Weight:	618g excluding packaging

9. Charger Profile Selection

The charger profile of the unit can be modified by moving the DIL switches as per the table below. In addition, switch 3 can be controlled using an external switch via connector P1. It can be switched ON by connecting pins 2 and 4 on connector P1.



DIL Switch 3	DIL Switch 4	Charger Output Type	Reverse Polarity Protection	Safety Timer
OFF	OFF	Fixed 13.6V Power Supply	NO	None
OFF	ON	Lead Acid Battery	YES	Max 4 Hours
ON	OFF	Gel/AGM1 Battery	YES	Max 12 Hours
ON	ON	AGM2 Battery	YES	Max 4 Hours