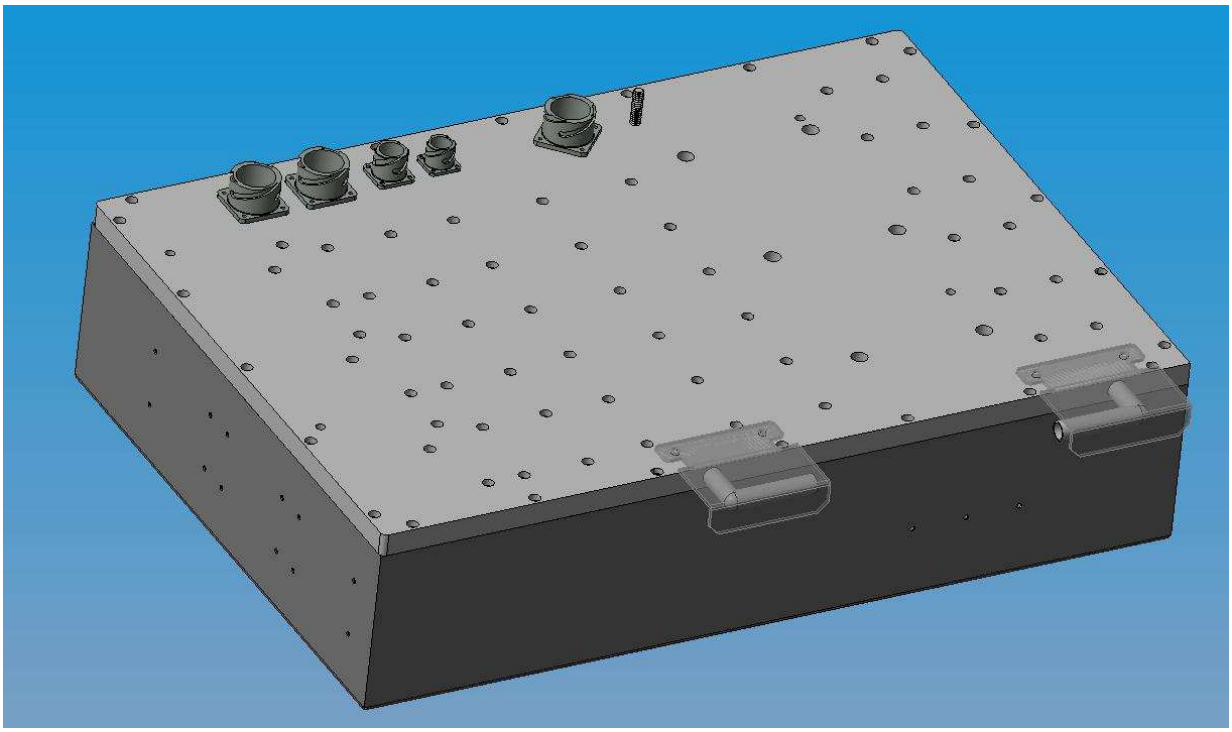
CMP326 Series

12/18KW dual/triple outputs EV/HEV ON-BOARD Charger for Lithium Battery Packs



User's MANUAL

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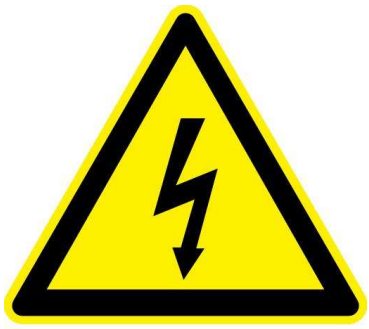
SAFETY INFORMATION

Dear Customer, for your safety...



HIGH VOLTAGE

- Read carefully the instructions in this manual.
- WARNING - High DC voltages can be dangerous and lethal. Failure to install or operate in accordance with these instructions may result in damage to the charger or injury to the operator.
- WARNING - The charger cannot operate without a safety ground connection. The use of a Ground Fault Interruption circuit is recommended.
- WARNING - Do not attempt to open the charger. There is risk of electric shock even if the charger is unplugged. No user serviceable components inside.
- Keep the charger far from heating sources.
- Use the proper cooling liquid
- The operating charger produces hot. Touching the hot charger can lead to injuries and burnings.
- If safe operation cannot be longer ensured, STOP and secure it against operation.
- If the charger failure or malfunction may cause personal injury or material damage, use additional safety and operational measures. Such as limit switches, guards, etc.
- Make sure that the battery pack and the mains power line characteristics is in the correct range with respect to the charger's technical data.
- Failure to install and use the charger in accordance with these manual and data may impair the protection provided by the charger and void the manufacturer's warranty.
- Have the charger installed and made operational by a skilled professional.
- Never disconnect the battery plug out of unit without breaking the battery pack connection beforehand.
- Remove the mains plug from the mains outlet before breaking the battery pack circuit.
- Always disconnect mains power line after charging and generally when the unit is not in use.

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FUNCTIONAL DESCRIPTION

Overview

CMP326 Series is a very versatile, safe and high tech water cooled charger for On-Board electric vehicle applications.

CMP326 charger series can charge 1, 2 or 3 separate Lithium battery packs at the same time, safely and powerfully.

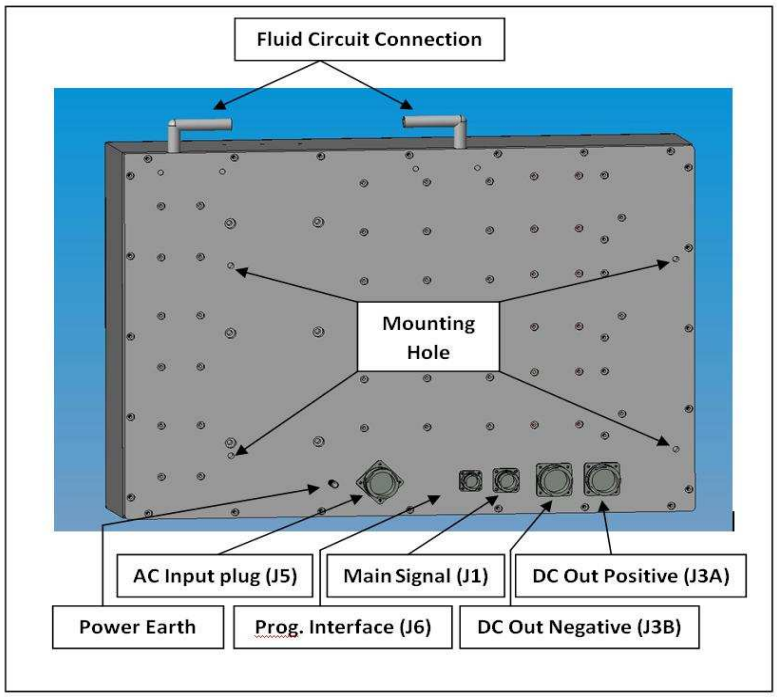
The unit contains two or three electrically isolated high frequency AC/DC converter with active Power Factor Correction circuitry that transforms the mains AC line into a controlled DC for charging the battery pack.
Each converter has an AC separate input.

CMP326 can be supplied either with single phase 230V P+N main line or 240 Split-phase line but also with 208V Three-phase WYE line.

The control signals isolated from battery pack assure for maximum personal protection and it is in compliance with the applicable Standard.
Moreover, enables a simply connection with the charging infrastructure (BMS, VMU).

An high protection degree (IP66) combined with a rugged design gives an exceptional usability in every situation.

CMP326 series meets the safety and EMC requirements established by the CE mark and ECE regulation.



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Operation Mode

CAN Mode

The charger is controlled by an external Battery Management System (BMS) or Vehicle Management Unit (VMU). The broadcast is done by CAN V2.0B and works in both direction (see MT3230).

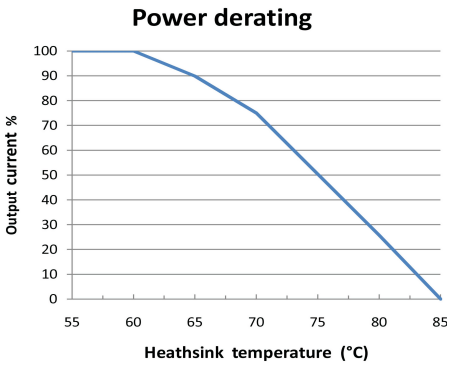
CAN Messages

In CAN mode the CMP326 is controlled by CAN messages. A fully customized V2.0B, STD/EXT frame and baud rate adaptable interface is available on request.

Overview – CAN messages:

Messages contents	
Control	Iout & Vout reference value, control bits
Status	Status of charger
Values	Actual Iout & Vout values of the charger
Temperatures	Internal temperature
Errors	Errors & Warning

See MT3230 for details



Power Limiter

The charger, in order to ensure safe operation, controls: output current, output voltage, power and temperature. The charging power is reduced if critical limits are reached.

In particular, in order to prevent the charger overheating, the output current is reduced from +60°C to +85°C of the heatsink's temperature according to the chart.
Higher heatsink's temperature produce the unit to switch off itself.

Auxiliary DC output V04

This output should go high as soon as the charger see AC and after a CAN message are transmitted on the CAN bus.

WATER PUMP contact

The switches are closed when baseplate is more than +35°C.

FAN contact

The switches are closed when baseplate is more than +40°C.

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TECHNICAL SPECIFICATION

Input Data	CMP326-01	CMP326-02	Units
Input Voltage Range (3P + PE + Pilot)	192...276	192...276	Vac
Line Frequency	47...63		Hz
Input current Max (controlled By CAN)	32 (each module)		Aac
Input power(max)	7100 (each module) x 3		KVA
Power Factor	> 0.98		

General Data		Units
Protections	Output overvoltage Output overcurrent Output polarity reversal Input overvoltage	
Ambient Temperature	-20...+55	°C
Heat Dissipation	Water cooling (50% Glycol/ 50%water, F>20lt/min, T<55°C)	
Protection Degree	IP66	
Efficiency	> 90 @ at max load	%
Broadcast communications	CAN V2.0B (500Kbit/s, standard frame, ID's adaptable)	
Remote alarm	N.O. contact potential free (“OR” of thermal protection, overvoltage, etc.)	

Ouputs Data	CMP326-01	CMP326-02	Units
V01 Output Voltage (max)	376	376	Vdc
V01 Output Current	17	17	Adc
V01 Rated Output Power	6390	6390	W
V01 Current control	By CAN BUS		
V02 Output Voltage (max)	376	376	Vdc
V02 Output Current	17	17	Adc
V02 Rated Output Power	6390	6390	W
V02 Current control	By CAN BUS		
V03 Output Voltage (max)	376	Not present	Vdc
V03 Output Current	17	Not present	Adc
V03 Rated Output Power	6390	Not present	W
V03 Current control	By CAN BUS		
V04 Output BMS Voltage	12		Vdc
V04 Output BMS Current	0,3		Adc

Standard Applied		Units
General Requirements	EN 61851-1, EN 61851-21	
EMC – Emission	EN61000-3-4, CISPR 14, 16 level A	
EMC – Immunity	EN61000-4-1, EN61000-4-4, EN61000-4-5, EN61000-4-11, EN61000-4-3	
SAFETY	EN 60950-1:2002 + A11:2004, ECE regulation 100	
Dielectric Withstand Voltage	Input / PE: 2000Vac @ 1min. Input / Output: 2000Vac @ 1min. Output / PE: 1000Vdc @ 1min. Input / SELV: 4000Vac @ 1min.	
Insulation resistance	Input, Output / PE: > 1MΩ @ 500Vdc	
Touch current	< 3.5	mA

Mechanical Data		Units
Dimensions: Width x Depth x Height	725 x 500 x 170	mm
Weight (ca.)	59	Kg
Case Material	Aluminium / Steel (black cataphoresis painted)	
Case Type	Box	
I/O Connections	AC input: IP67 MS Circular connectors DC Outputs (to battery packs): IP67 MS Circular connectors Control signal and Interface: IP67 MS Circular connectors	

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CONNECTORS SPECIFICATION

Id	Function	Mate connector	
J1	*Main signal connector*	*Brand: ITT Cannon*	*Code: CA3106E16S-1PB-F80 or equivalent*
J3A	*DC Output Positive*	*Brand: ITT Cannon*	*Code: CA3106E24-22PB-F80 or equivalent*
J3B	*DC Output Negative*	*Brand: ITT Cannon*	*Code: CA3106E24-22PWB-F80 or equivalent*
J5	*AC Input*	*Brand: ITT Cannon*	*Code: CA3106E24-10SB-F80 or equivalent*
J6	*Programming & Monitoring Interface*	*Brand: ITT Cannon*	*Code: CA3106E14S-1PB-F80 or equivalent*
E1	*CHASSIS_GND*	*M8 x 30 mm Ground Stud*	

PINS DATA: Main Signal Connector (J1) :

PIN	Function		AWG contact size
A	+12V Out (V04)	Negative closed to GND	AWG 16
B	Reserved		
C	CAN_H		AWG 16
D	CAN_L		AWG 16
E	CAN Shield		AWG 16
F	#Water Pump Out	24V, 1A Relay contact switched to GND	AWG 16
G	#Fan Out	24V, 1A Relay contact switched to GND	AWG 16

PINS DATA: DC Output Positive (J3A) :

PIN	Function		
A	ChgA Out(+)	V01 Positive Main Output	AWG 8
B	ChgB Out(+)	V03 Positive Main Output (18KW only)	AWG 8
C	ChgC Out(+)	V02 Positive Main Output	AWG 8
D	CONNECTION CONTROL LOOP (connect to J3B pin D to START)	5V, 5mA	AWG 8

PINS DATA: DC Output Negative (J3B) :

PIN	Function		
A	ChgA Out(-)	V01 Negative Main Output	AWG 8
B	ChgB Out(-)	V03 Negative Main Output (18KW only)	AWG 8
C	ChgC Out(-)	V02 Negative Main Output	AWG 8
D	CONNECTION CONTROL LOOP (connect to J3A pin D to START)	5V, 5mA	AWG 8

PINS DATA: AC Input (J5) :

PIN	Function		
A	PHASE 1	for V01 module	AWG 8
B	NEUTRAL 1	for V01 module	AWG 8
C	PHASE 3	for V03 module (18KW only)	AWG 8
D	NEUTRAL 3	for V03 module (18KW only)	AWG 8
E	PHASE 2	for V02 module	AWG 8
F	NEUTRAL 2	for V02 module	AWG 8
G	GND		AWG 8

PINS DATA: Programming & Monitoring Interface (J6) :

PIN	Function	
A	TX	AWG 16
B	RX	AWG 16
C	GND	AWG 16

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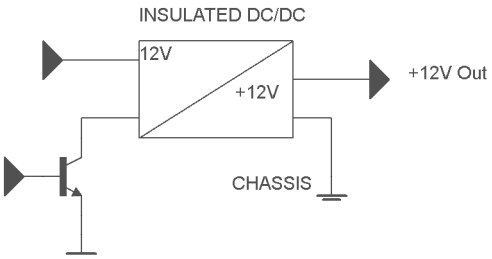
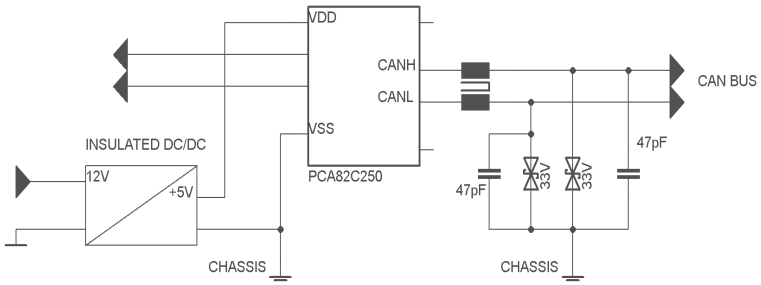
Control pins Specification



+12V Out (V04)

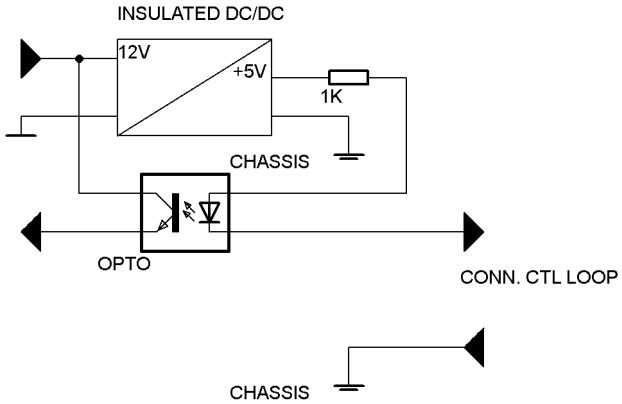
The charger has an 12V/0.3A (V04) DC output that can be used to wake up the BMS unit.
This output should go high as soon as the charger see AC and after a CAN message are transmitted on the CAN bus.



CAN BUS

The CAN interface has the following characteristics:

- CAN V2.0B,
- 500Kbit/sec
- Standard frame
- Electrically isolated from battery pack potential
- No terminating resistor



CONNECTION CONTROL LOOP

The unit has able to start only if the CONTROL LOOP is closed (J3A and J3B pin D shorted together).

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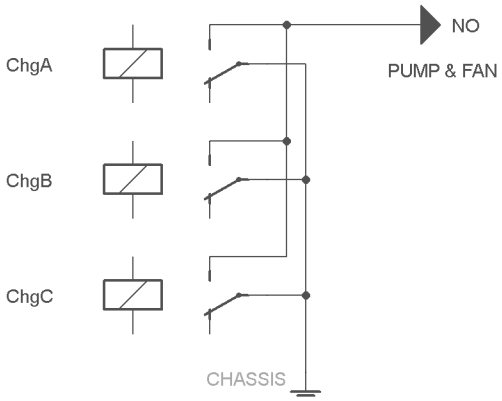

PUMP & FAN Output

The picture shows the contacts in not energized status (or when the charger is in OFF state).

Water Pump signal indicates when an Internal temperature is above 35°C.
Fan Out signal indicates when an Internal temperature is above 40°C.

COOLING CIRCUIT

The charger's baseplate has an Aluminium pipe used as water cooling loop.
Input and output terminations of the pipe have a nominal external diameter of 16mm.
The coolant requirements is: 50% ethylene glycol and 50% of demineralized water and the water flow rate must be more than 10lt/min;
In particular it is recommended to use glycol with the Aluminium Corrosion inhibitor and establish a good grounding fixing to avoid corrosion process.
Aluminium Corrosion inhibitor is designed to provide improved metal wetting and excellent corrosion inhibition when added to plain water or a glycol coolant. It will provide the proper corrosion inhibition for all cooling system metals, including aluminium.
If this inhibitor is not present in the coolant, the cooling system could be damaged.

The pressure drop of the charger's pipe is about 0,5bar@20lt/min.

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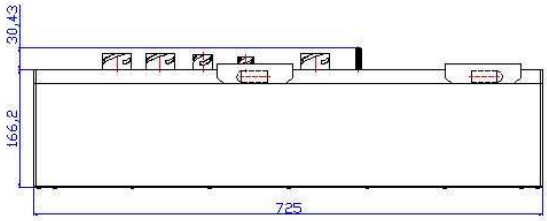
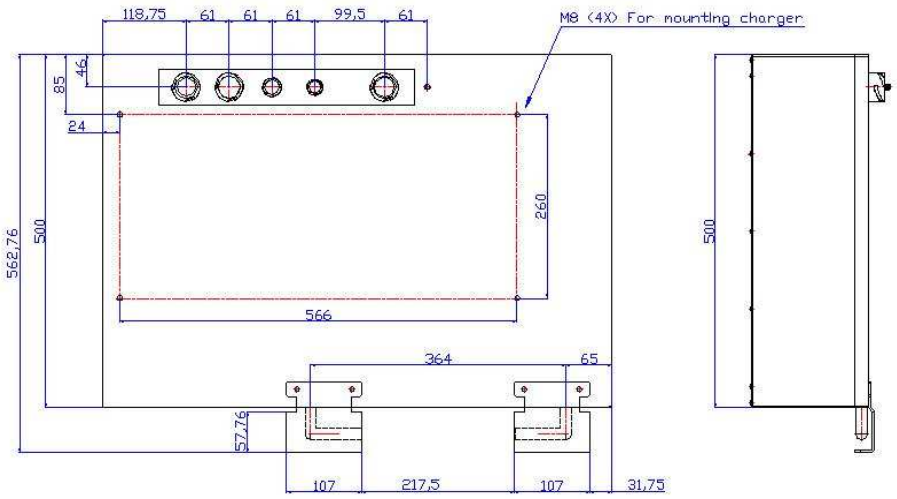
MECHANICAL DATA





WARRANTY

CMP326 series have a warranty covering defects in materials and workmanship for a period of 24 months from the date of purchase.

Improper use or handling of the products causes the warranty to be void.

Technical specification are subjected to change without notice.

Take note that lethal voltages exist around this unit. EDN GROUP cannot accept any liability concerning this danger.

EDN GROUP furthermore do not accept any liability for consequential damages which arose from the use of this device.

WARNING

Take note that careless handling of high DC voltages can be very dangerous and lethal.

So please take time to read the manual and connect the unit properly

and call a skilled professional in any case**.**

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