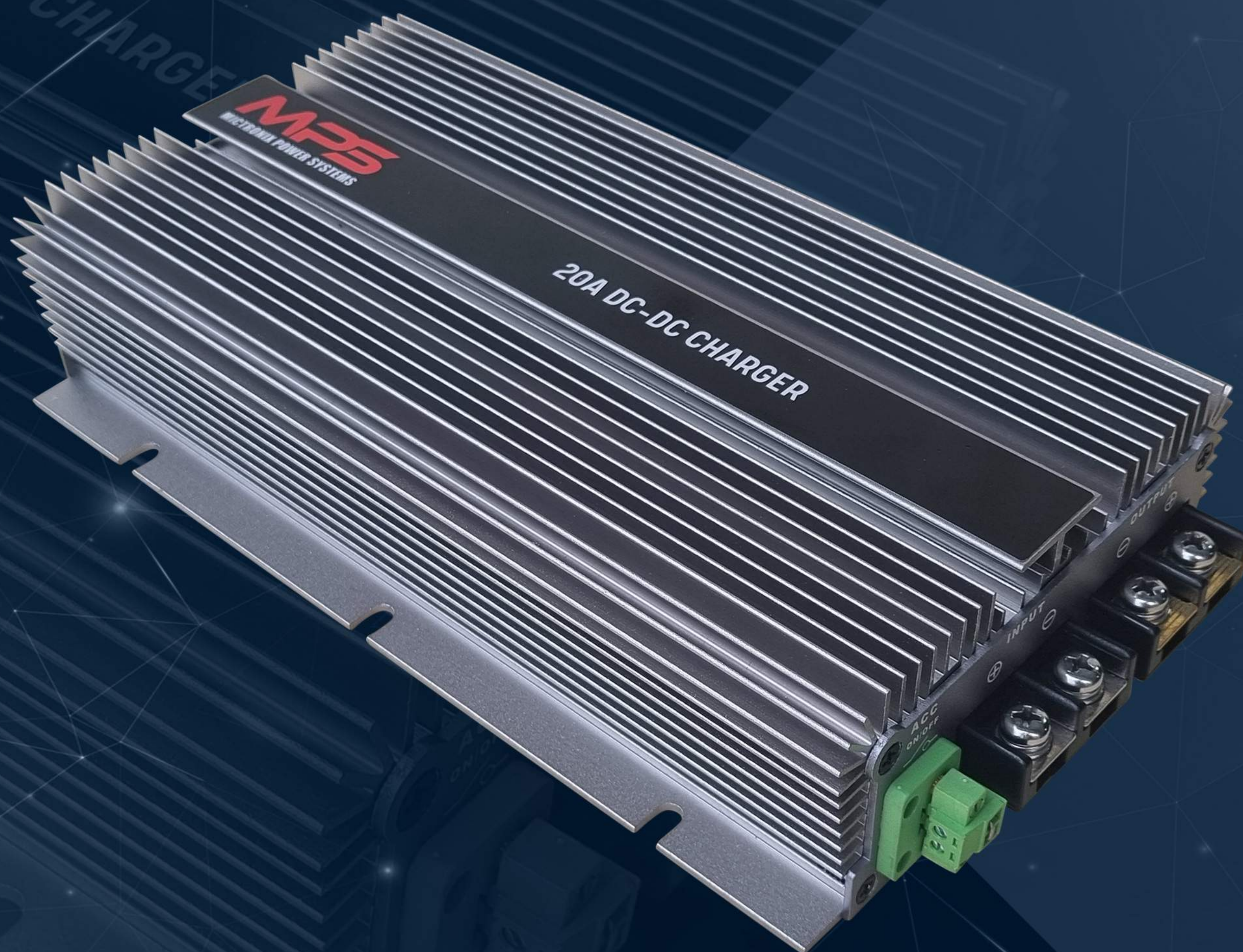




MICRONIX POWER SYSTEMS



PRODUCT MANUAL

12V/24V TO 48V DC TO DC CHARGER

INTRODUCTION

The MPS12/24V DC to DC charger has been made to easily and efficiently charge 48 volt battery systems from 12V / 24V alternators and batteries.

Simplicity of installation and ruggedness was a priority in the design process.

FEATURES

- ✓ Automatic input voltage sensing 12V/24V
- ✓ Automatic start and stop based on input voltage sensing
- ✓ Dedicated Lithium charging profile for both MPS and Pylontech batteries
- ✓ 100% full rated power
- ✓ 100% full stable output Current
- ✓ High efficiency up to 95%
- ✓ IP68 waterproof, Epoxy potting, Anti-vibration, Dustproof
- ✓ Cooling by free air convection
- ✓ Surface mountable
- ✓ 3 years warranty
- ✓ Over current protection, over voltage protection, output short circuit protection
- ✓ Automatic temperature regulation and shutdown on over temperature

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SAFETY

Designers and installers must have a detailed understanding of this manual before undertaking any works involving the charger. They must also be qualified to carry out the installation of the charger in the intended geographical region.

Battery charging, discharging and storage specifications must be followed at all times.

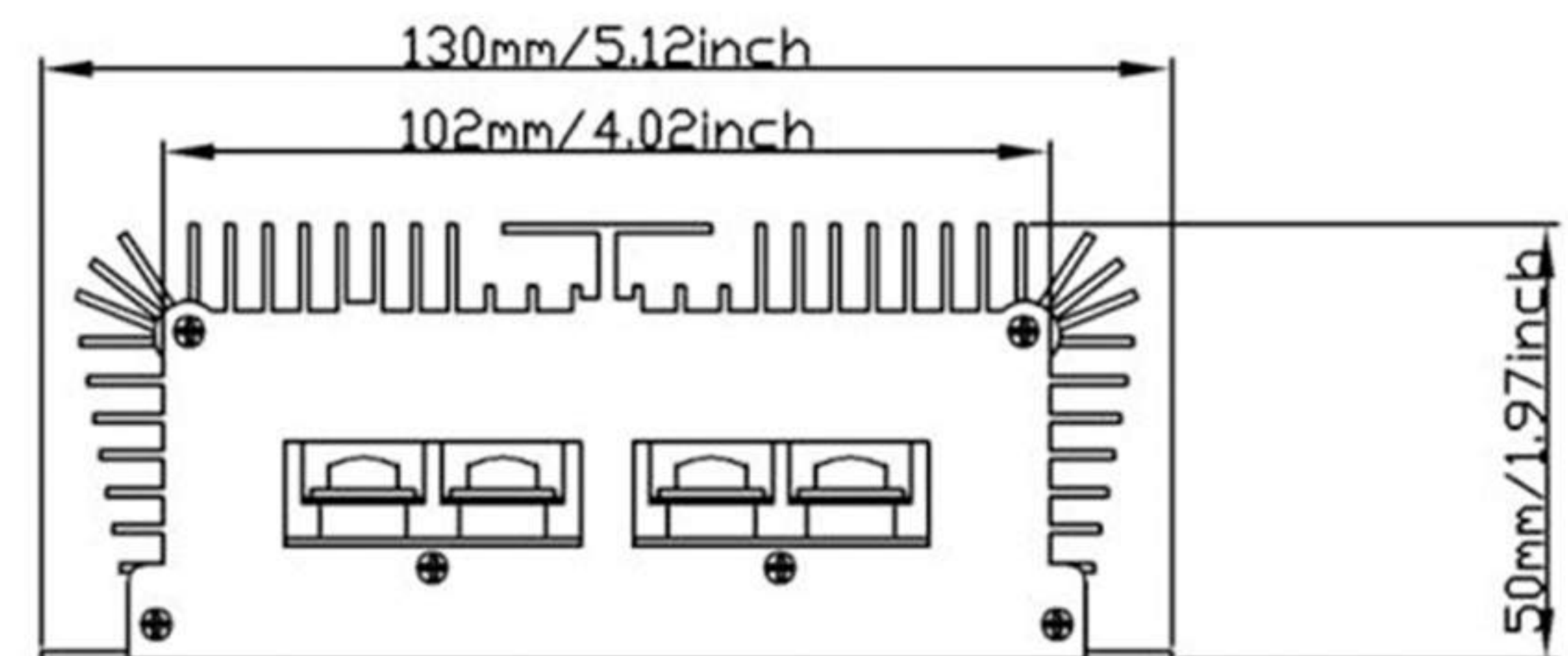
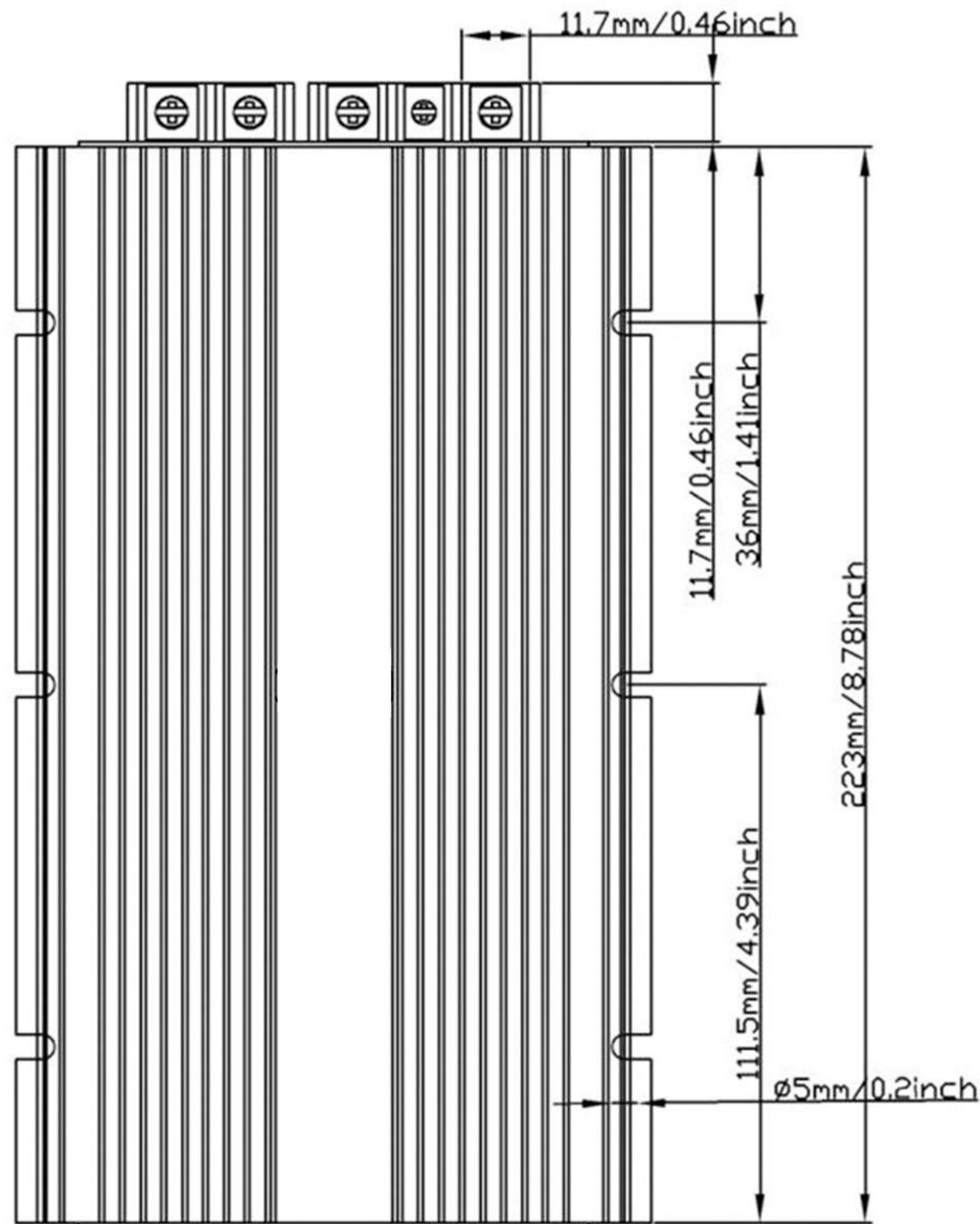
KEY SAFETY POINTS

- ✓ The charger must have appropriate fusing installed on input and output
- ✓ The charger must be installed with appropriately sized cabling to minimise voltage drop
- ✓ The charger must not be exposed to salt spray
- ✓ The charger must not be installed in direct sunlight
- ✓ The charger must be removed from service if damaged
- ✓ The charger must not be disassembled
- ✓ Do not reverse the polarity of the charger on either input and output
- ✓ The charger may become hot during operation

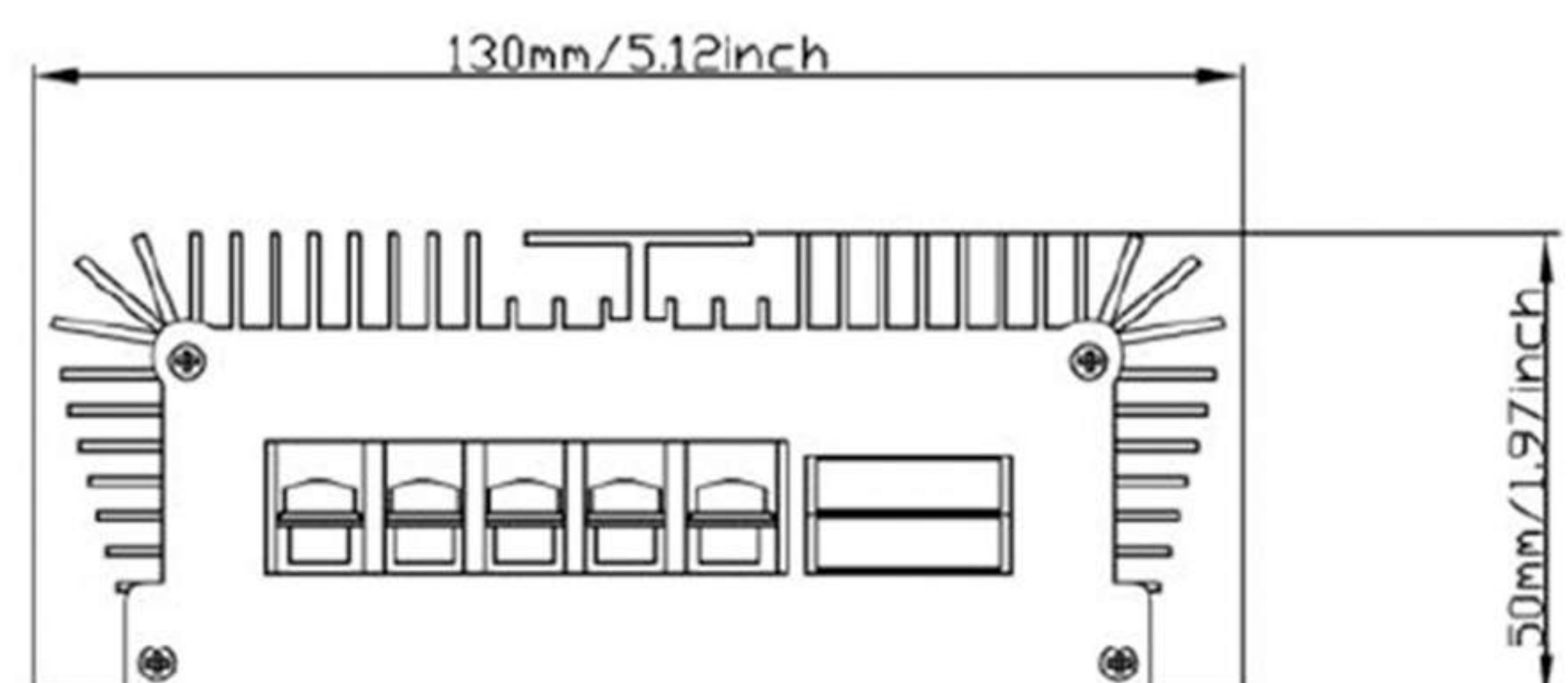
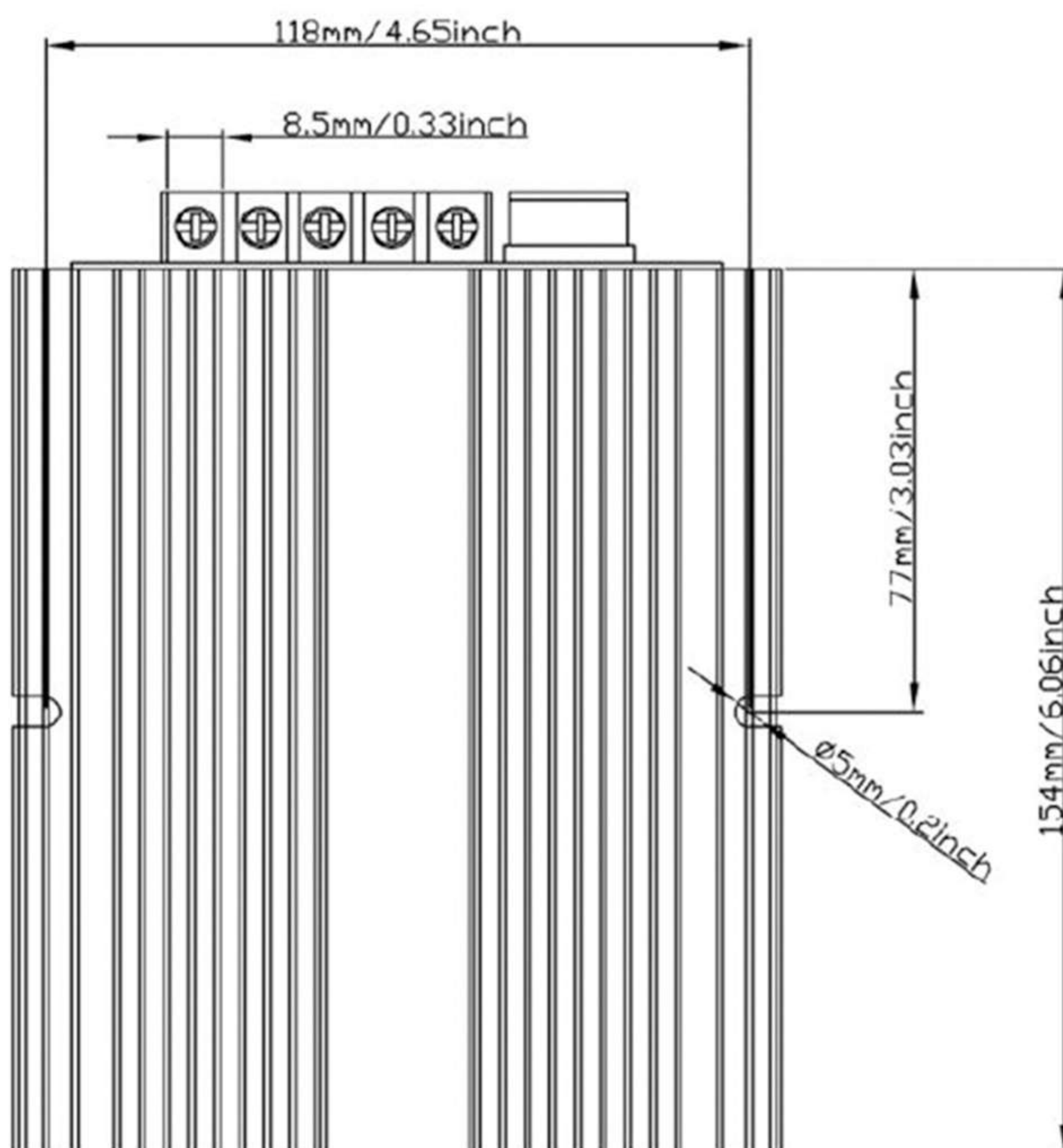
SPECIFICATIONS

DIMENSIONS

20A model



10A model



MODEL NUMBER	MPS-DC-10-56	MPS-DC-20-56	MPS-DC-10-52	MPS-DC-20-52
Input voltage	12V-16.3V/24V-32V	12V-16.3V/24V-32V	12V-16.3V/24V-32V	12V-16.3V/24V-32V
Output voltage	56.0V	56.0V	52.4V	52.4V
Input current	45A @ 12.6V 22A @ 25.2V	90A @ 12.6V 44A @ 25.2V	43A @ 12.6V 21A @ 25.2V	90A @ 12.6V 44A @ 25.2V
Output current	10A	20A	10A	20A
Idle current	<5mA	<5mA	<5mA	<5mA
Typical efficiency	95%	95%	95%	95%
Line regulation	±0.2%	±0.2%	±0.2%	±0.2%
Load regulation	±0.2%	±0.2%	±0.2%	±0.2%
Voltage accuracy	±1.5%	±1.5%	±1.5%	±1.5%
Temperature derating	>50°C	>50°C	>50°C	>50°C
Ambient operating temperature	-20 - 60°C	-20 - 60°C	-20 - 60°C	-20 - 60°C
Automatic start voltage	13.4V / 26.6V	13.4V / 26.6V	13.4V / 26.6V	13.4V / 26.6V
Automatic stop voltage	12.4V / 24.8V	12.4V / 24.8V	12.4V / 24.8V	12.4V / 24.8V
Recommended fuse size (input)	60A @ 12V 30A @ 24V	125A @ 12V 60A @ 24V	60A @ 12V 30A @ 24V	125A @ 12V 60A @ 24V
Recommended fuse size (output)	20A	32A	20A	32A
Weight	1500 grams	2450 grams	1500 grams	2450 grams
Dimensions	165 x 130 x 50mm	235 x 130 x 50mm	165 x 130 x 50mm	235 x 130 x 50mm
Packaging dimensions	240 x 155 x 95mm	310 x 155 x 95mm	240 x 155 x 95mm	310 x 155 x 95mm

INSTALLATION

This manual should be followed for correct installation of the charger.

MOUNTING

The charger may be mounted to a solid surface by bolting or screwing through the provided mounting holes. Care should be taken to firmly fix the device strong enough to resist vibrations.

MPS does not recommend mounting inside engine bays due to possible heat and corrosion issues.

HORIZONTAL VS VERTICAL MOUNTING

The charger may be mounted in any orientation.

CLEARANCES

The charger should have 100mm of clearance from all sides to ensure adequate cooling.

TEMPERATURE

The ambient temperature will determine how much power the charger can output. As the charger is boosting voltage, there are some losses involved which present as heat. Due to the higher input currents at 12V, there will be more heat generated. When the case temperature reaches approximately 60 degrees, the charger will start to reduce output current to maintain heat at a safe level.

Inside confined spaces there may be a requirement to add ventilation and or fans to remove generated heat.

DISTANCE FROM BATTERIES

There are two scenarios where the charger can be mounted.

Closer to the 12 / 24V battery has the benefit of reducing the high current cabling voltage drop. The chances of premature starting and stopping of the charger will be reduced. This may cause slower charging of the 48V battery towards the end of the charge cycle due to voltage drop over the 48V cabling.

Closer to the 48V battery requires larger cabling on the 12 / 24V side but ensures full power charging right up to the end of the charge cycle.

LOCATION

Local regulations should be followed when determining a mounting location for the charger.

Direct sunlight should be avoided.

Salt spray in coastal locations should be avoided. Otherwise, a sealed enclosure may need to be used.

ELECTRICAL CONNECTIONS

CONNECTIONS

The charger comes with cable lugs to suit the input and output screw terminals. It is important to ensure cabling is sized appropriately to avoid voltage drop issues which can lead to incorrect operation of the charger.

The 10A model comes with cable lugs to suit 10mm² cable on the 12 / 24V side. If larger cables are needed it is recommended to have a short section of 10 mm² cable which is then joined to the larger cable using an appropriate high current connection such as bolted cable lugs, crimp reducers or screwed cable links. The 48V side is supplied with cable lugs to suit 10mm² cable.

The 20A model comes with cable lugs to suit 35mm² cable. If larger cables are needed it is recommended to have a short section of 35 mm² cable which is then joined to the larger cable using an appropriate high current connection such as bolted cable lugs, crimp reducers or screwed cable links. The 48V side is supplied with cable lugs to suit 10mm² cable.

FUSING

The cabling to and from the charger must be fused appropriately. Please consult the specifications section of this manual for fuse sizes. Appropriately rated DC circuit breakers may be used.

Device current rating	Cable length	Cable size on input
10A model @ 12V input	0 – 1M	10mm ²
10A model @ 24V input	0 – 1M	10mm ²
10A model @ 12V input	1 – 3M	25mm ²
10A model @ 24V input	0 – 3M	10mm ²
10A model @ 12V input	3 – 6M	35mm ²
10A model @ 24V input	3 – 6M	25mm ²
20A model @ 12V input	0 – 1M	35mm ²
20A model @ 24V input	0 – 1M	35mm ²
20A model @ 12V input	1 – 3M	50mm ²
20A model @ 24V input	0 – 3M	35mm ²
20A model @ 12V input	3 – 6M	50mm ²
20A model @ 24V input	3 – 6M	35mm ²

OPERATION AND COMMISSIONING

OPERATION

When the start battery and alternator are less than the automatic start voltage, the charger will stay in idle mode. Once the voltage on the input terminals increases above the automatic start voltage, the charger will commence charging. If at any time the input voltage decreases below the automatic stop voltage, the charger will cease charging.

Upon power up, the charger will automatically detect between 12v or 24v operation.

If there is excessive voltage drop on the input cables, the charger may stop and start. This can be tested by measuring the voltage at the input terminals and comparing it to the voltage at the start battery. If there is excessive voltage drop the cable size would need to be increased.

If the charger reaches a high operating temperature, it will reduce the output power to ensure the case temperature does not get too high. Undersized input cables can cause extra temperature rise.

COMISSIONING

- ✔ Before connecting the input and output cables, the polarity should be tested to avoid damage to the unit and or batteries.
- ✔ Confirm cable and fuse sizes are as per the specifications listed in this manual.
- ✔ Terminate cables to the input and output connections.
- ✔ Double check all connections on the installation to avoid hot joints.
- ✔ Start the engine and using a clamp meter, check input and output current meets the specifications.

PERIODIC MAINTENANCE

- ✔ Check cable connections are tight.
- ✔ Ensure there are no hot joints on all connections in the system.
- ✔ Ensure cable insulation is not damaged or worn away.
- ✔ Ensure mounting screws are tight.

DISPOSAL

The charger can be recycled via an E waste facility at the end of its usable life.

WARRANTY

The charger has a 3-year warranty from date of purchase. Reverse polarity will damage the unit and is not covered by warranty.