CZONE Motor Output Interface Installation Guide

Motor Output Interface
Installation Guide

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Motor Output Interface

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Important
BEP Marine strives to ensure all information is correct at the time of printing. However, the company reserves the right to change without notice any features and specifications of either its products or associated documentation.
Translations: In the event that there is a difference between a translation of this manual and the English version, the English version should be considered the official version. It is the owner's sole responsibility to install and operate the device in a manner that will not cause accidents, personal injury or property damage.

Use of This Manual

Copyright © 2018 BEP Marine LTD. All rights reserved.Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of BEP Marine is prohibited.This manual serves as a guideline for the safe and effective operation, maintenance and possible correction of minor malfunctions of the Output Interface Module.

GENERAL INFORMATION

USE OF THIS MANUAL

Copyright © 2016 BEP Marine. All rights reserved.Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of BEP Marine is prohibited.This manual serves as a guideline for the safe and effective operation, maintenance and possible correction of minor malfunctions of the Motor Output Interface, called MOI further in this manual.
This manual is valid for the following models:

Description	Part number
CZONE MOI C/W CONNECTORS	80-911-0007-00
CZONE MOI C/W CONNECTORS	80-911-0008-00

It is obligatory that every person who works on or with the MOI is completely familiar with the contents of this manual, and that he/she carefully follows the instructions contained herein.
Installation of, and work on the MOI, may be carried out only by qualified, authorized and trained personnel, consistent with the locally applicable standards and taking into consideration the safety guidelines and measures (chapter 2 of this manual). Please keep this manual in a secure place!

GUARANTEE SPECIFICATIONS
BEP Marine guarantees that this unit has been built according to the legally applicable standards and specifications. Should work take place which is not in accordance with the guidelines, instructions and

specifications contained in this
Installation manual, then damage may occur and/or the unit may not fulfil its specifications. All of these matters may mean that the guarantee becomes invalid.

QUALITY

During their production and prior to their delivery, all of our units are extensively tested and inspected. The standard guarantee period is two years.

VALIDITY OF THIS MANUAL

All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the Combined Output Interface delivered by BEP Marine.

LIABILITY

BEP can accept no liability for:

- Consequential damage due to use of the MOI. Possible errors in the manuals and the results thereof CAREFUL! Never remove the identification label

Important technical information required for service and maintenance can be derived from the type number plate.

CHANGES TO THE MOTOR OUTPUT INTERFACE

Changes to the MOI may be carried out only after obtaining the written permission of BEP.

SAFETY AND INSTALLATION PRECAUTIONS

WARNINGS AND SYMBOLS

Safety instructions and warnings are marked in this manual by the following pictograms:

 **CAUTION**

Special data, restrictions and rules with regard to preventing damage.

 **WARNING**

A WARNING refers to possible injury to the user or significant material damage to the MOI if the user does not (carefully) follow the procedures.

 **NOTE**

A procedure, circumstance, etc, which deserves extra attention.

USE FOR INTENDED PURPOSE

1. The MOI is constructed as per the applicable safety-technical guidelines.
2. Use the MOI only:
   - In technically correct conditions
   - In a closed space, protected against rain, moisture, dust and condensation
   - Observing the instructions in the installation manual

    **WARNING** Never use the MOI in locations where there is danger of gas or dust explosion or potentially flammable products!
3. Use of the MOI other than mentioned in point 2 is not considered to be consistent with the intended purpose. BEP Marine is not liable for any damage resulting from the above.

ORGANIZATIONAL MEASURES

The user must always:

- Have access to the user's manual and be familiar with the contents of this manual

MAINTENANCE AND REPAIR

- Switch off supply to the system
- Be sure that third parties cannot reverse the measures taken
- If maintenance and repairs are required, only use original spare parts

GENERAL SAFETY AND INSTALLATION PRECAUTIONS

- Connection and protection must be done in accordance with local standards
- Do not work on the MOI or system if it is still connected to a power source. Only allow changes in your electrical system to be carried out by qualified electricians
- Check the wiring at least once a year. Defects such as loose connections, burned cables, etc. must be corrected immediately

OVERVIEW

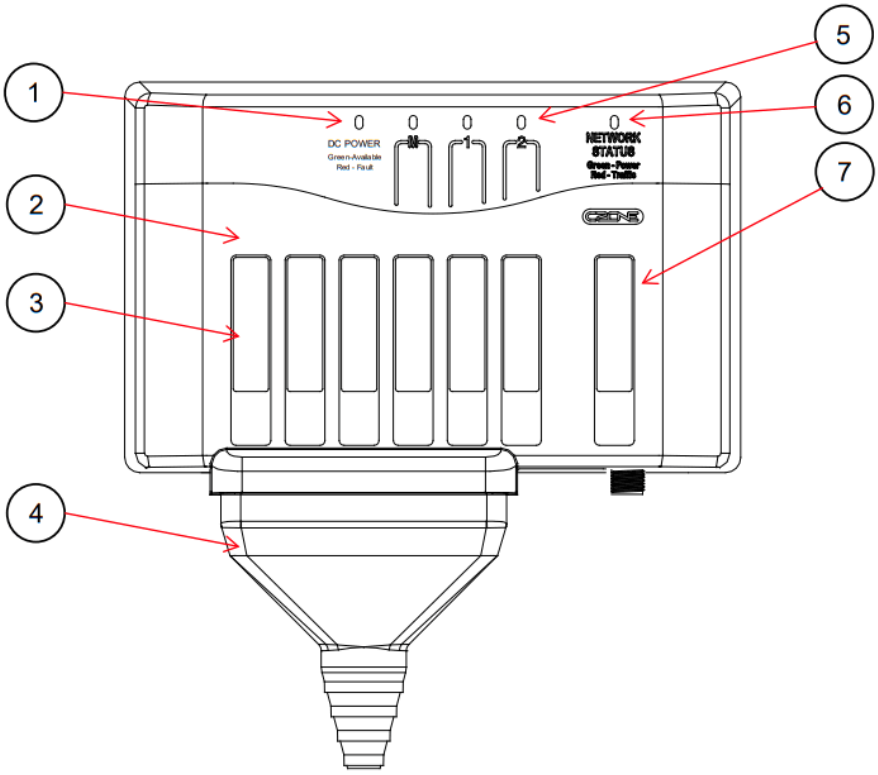
DESCRIPTION

The Motor Output Interface (MOI) has an output pair for controlling DC motors which require a reversal of polarity to change the direction of their mechanical operation. For example, a DC motor for an electric window mechanism will move the window up or down depending on the polarity of the feed to the motor. The MOI also incorporates two standard output channels such as is found on the Output Interface. Connection to the unit is simple: a large 6 way plug allows connections to cables of up to 16 mm2 (6AWG) in size, or multiple smaller conductors. No need for specialized crimp terminals and expensive crimp tools to be carried for terminations to CZone, just a blade screwdriver. A protective flexible boot offers protection to the connections from harsh environment conditions.

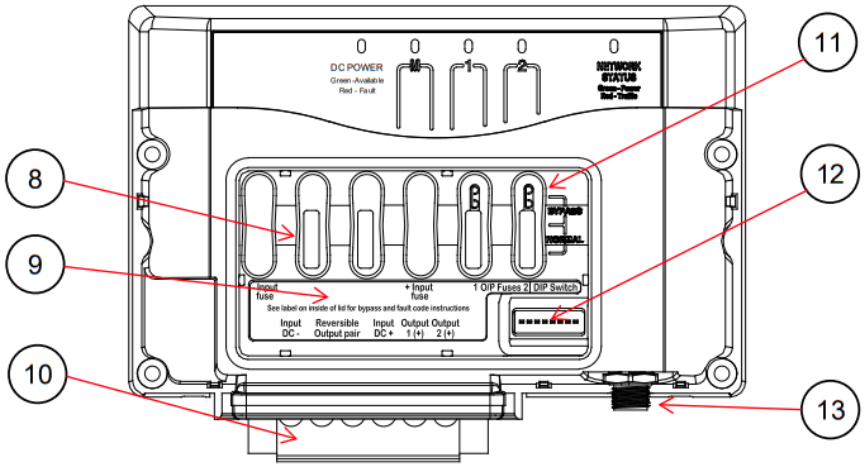
FEATURES

- 4 levels of backup fusing including manual override (as required by ABYC)
- Multiple channels can be bridged together to offer higher current switching
- Power consumption 12 V: 85 mA (standby 60 mA)
- Dimensions, WxHxD: 7-29/32″x5″x1-3/4″ 200x128x45 mm
- Small, non metallic, easy to install case
- 2 x 20 amps circuits
- 1 x 20A “H Bridge” output for controlling direction of DC motors through polarity change
- IPX5 water ingress protection
- Programmable software fuse sizes

MOI HARDWARE OVERVIEW



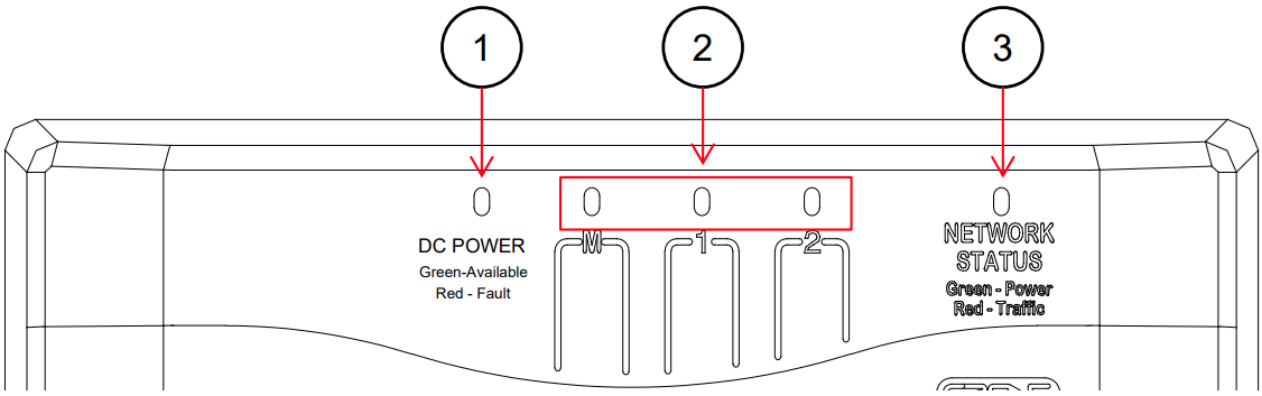
MOI With Cover



MOI No Cover

1. DC Power LED	8. Motor Circuit Fuses
2. Waterproof Cover	9. MOI Input/Output Fuse Label
3. Circuit ID Labels	10. DC Output Connector
4. Protective Boot	11. Output Circuit Fuses
5. Channel Status LEDs	12. Dipswitch
6. Network Status LED	13. NMEA 2000 Connector
7. Module ID Label	

LED INDICATORS



MOI LED Indicators

1. DC Power LED

Colour	Description
Extinguished	Network Power Disconnected
Green	Input Power Available
Red	Input Power Reverse Polarity

2. Channel Status LED Indicators

Colour	Description
Extinguished	Channel Off
Green Solid On 1 Red Flash	Channel On
1 Red Flash	Module Not Configured
2 Red Flash	Configuration Conflict
3 Red Flash	DIP Switch Conflict
4 Red Flash	Memory Failure
5 Red Flash	No Modules Detected
6 Red Flash	Low Run Current
7 Red Flash	Over Current
8 Red Flash	Short Circuit
9 Red Flash	Missing Commander
10 Red Flash	Reverse Current
11 Red Flash	Current Calibration

3. Network Status LED Indicator

Colour	Description
Extinguishe	Network Power Disconnected
Green	Network Power Connected
Red Flash	Network Traffic

DESIGN

- Ensure load being H-Bridged is capable of being controlled via polarity change.
- Load must be under 20amps current draw.
- Make a list of outputs to be wired to the MOI and assign them to one of the 2 output channels.
- Ensure all cables are appropriately rated for each assigned load.
- Output connector accepts cable gauges 24AWG – 8AWG (0.5 – 6mm).
- Ensure power supply cable to the MOI is appropriately rated for the maximum continuous current of all loads and is fused appropriately to protect the cable.
- Ensure continuous current draw of each connected load does not exceed maximum channel rating of 20A.
- Install the appropriately rated fuses for each channel.
- Loads exceeding 20A will require paralleling 2 channels together.

INSTALLATION

THINGS YOU NEED

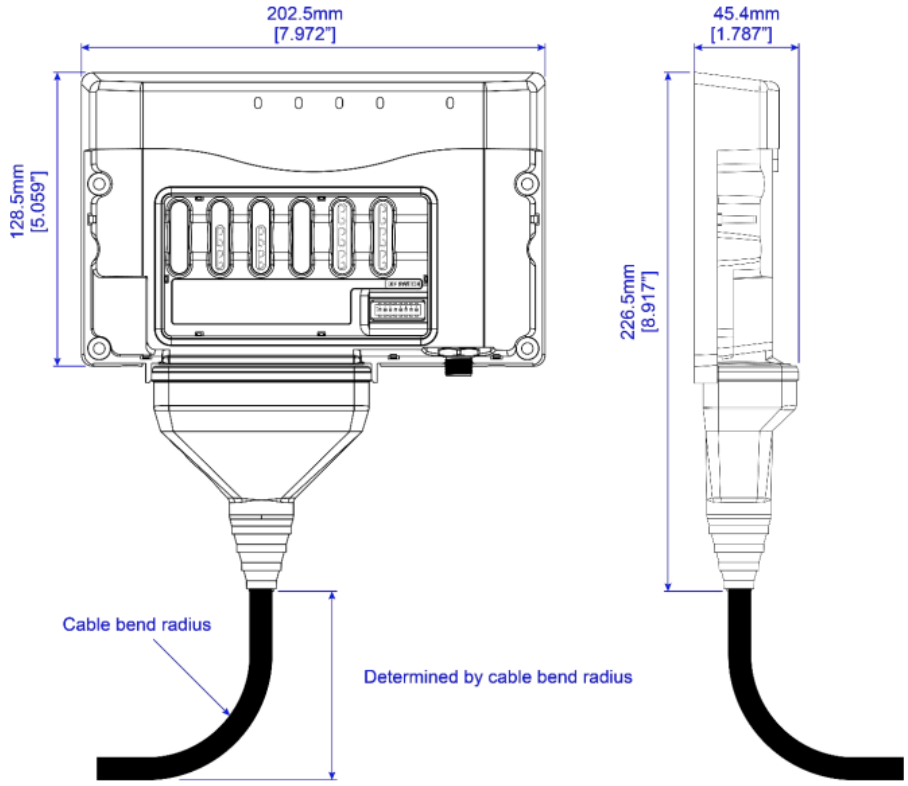
- Electrical tools
- Wiring and fuses
- Motor Output Interface Module
- 4 x 8G or 10G (4mm or 5mm) self-tapping screws or bolts for mounting the MOI

ENVIRONMENT

Obey the following stipulations during installation:

- Ensure the MOI is located in an easily accessible location and indicator LED’s are visible.
- Ensure there is enough clearance above the MOI to allow the cover to be removed.
- Ensure there is at least 10mm clearance around the sides and top of the MOI.
- Ensure the MOI is mounted on a vertical flat surface.
- Ensure there is sufficient space for the wires to exit the product.

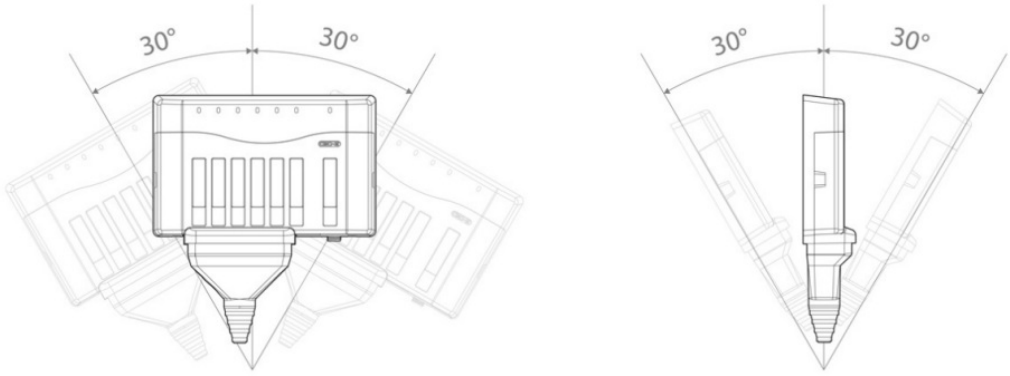
MOUNTING



MOI Mounting

1. Mount the MOI on a vertical surface with the cables exiting downwards.
2. Allow enough space below cable grommet for wiring bend radius.

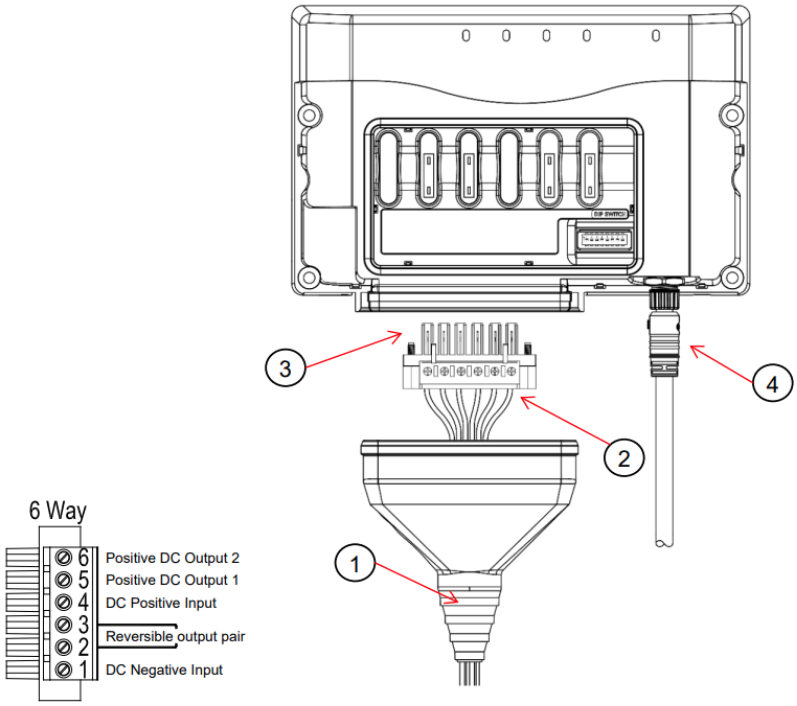
   Note – Cable radius determined by wiring manufacturer.
3. Fasten the MOI by using 4 x 8G or 10G (4mm or 5mm) self-tapping screws or bolts (not supplied).



IMPORTANT – The MOI must be mounted within 30 degrees from the vertical position to ensure water correctly runs away from the product if mounted in a location where water can contact the product.

CONNECTIONS

The MOI has a convenient output connector that requires no crimping tools and accepts cables from 24AWG to 8AWG (0.5 – 6mm). The unit has no power key and will turn on when power is applied to the network. The module will continue to draw power even when it is not in operation. It is recommended that a battery isolator switch is installed for when the system is not in use.



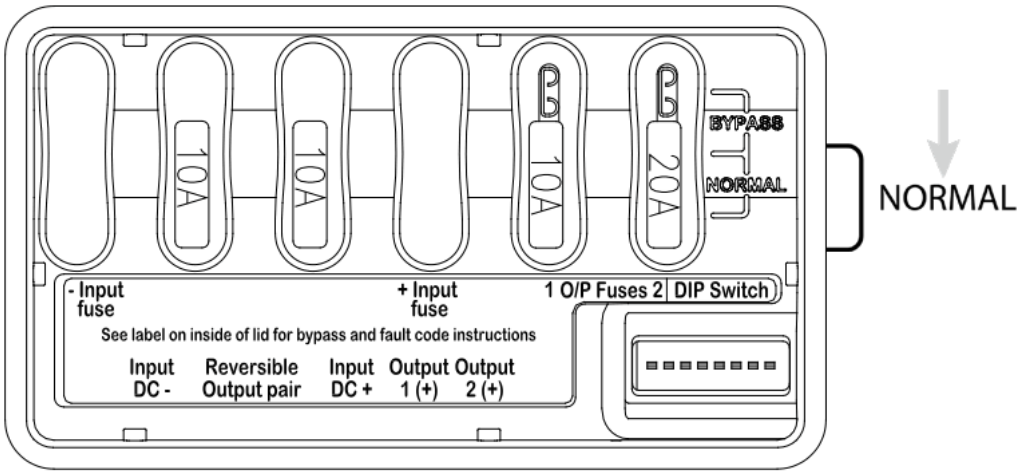
MOI Connections

1. Feed output wires through cable grommet
2. Strip and insert each wire into the connector ensuring the correctly rated wire is used for each load and tighten screws to 4.43 in/lbs (0.5NM).
3. Insert plug firmly into module and tighten 2x retaining screws.
4. Connect a NMEA2000 drop cable from the NMEA2000 backbone (do not power up network yet).

IMPORTANT – The positive cable must be sufficient size to carry the maximum current of all loads connected to the MOI. It is recommended to have a fuse/circuit breaker rated to protect the cable.

INSERTING FUSES

The MOI provides ignition protected circuit protection for each individual channel via standard ATC fuses (not supplied). Appropriately rated fuses should be selected and installed for each channel to protect the load and the wiring for each circuit.



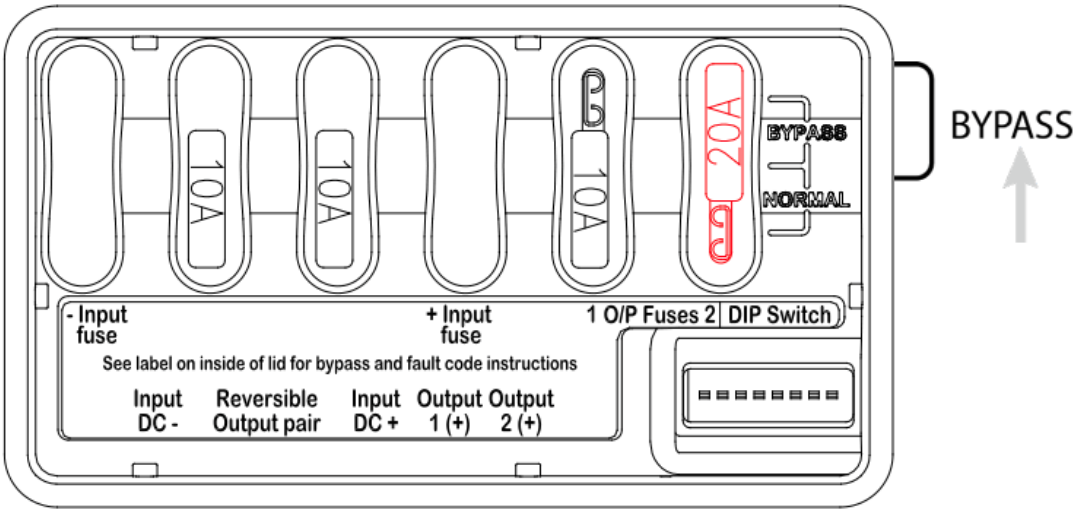
Fuses In Normal Operation

1. Select the appropriate fuse rating for each individual circuit.
2. Insert the correctly rated fuses into the NORMAL (bottom) position of all circuits.
3. The ATC fuse should be rated to protect the connected load and the wiring from the MOI to the load and also

the ground wire.

MECHANICAL BYPASS

The MOI includes a mechanical bypass feature on each of the 2 output channels for redundancy purposes. Moving any fuse to the BYPASS (top) position will supply constant battery power to that output. See below diagram showing circuit #2 in the BYPASS position.



Fuse in Bypass Position

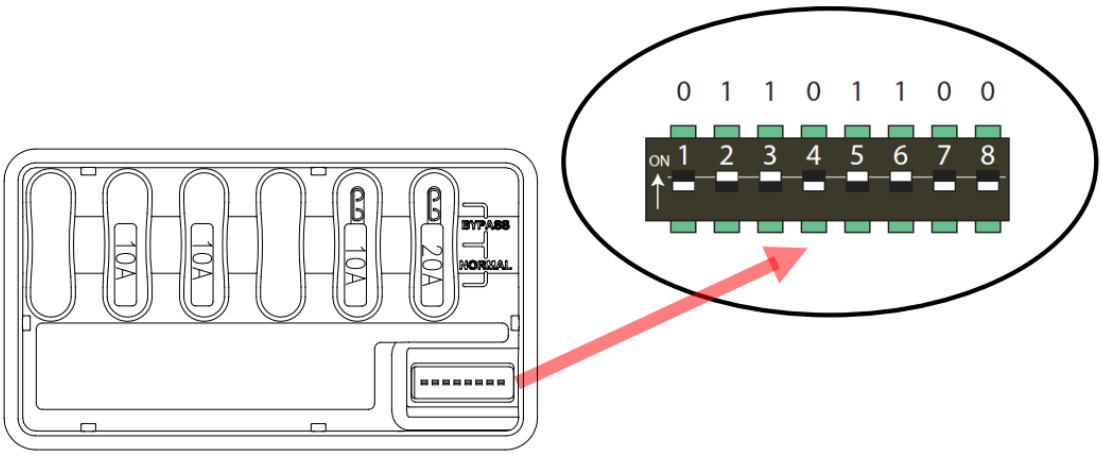
NOTE – MOI does not have circuit bypass on the H-Bridge Channel.

WARNING – Ensure area is free of explosive gasses before removing/replacing fuses or placing fuses in the bypass position as sparks may occur.

NETWORK CONFIGURATION

CZone modules communicate with each other over a NMEA2000 CAN BUS network. Each module needs a unique address, this is achieved by carefully setting the dipswitch on each module with a small screwdriver. The dipswitch on each module must match the setting in the CZone configuration. Refer to CZone Configuration Tool Manual on instructions on creating and editing a CZone configuration.

- To install the MOI with other networked CZone modules, or to achieve advanced functionality such as timers, load shedding or one touch Modes of operation, a custom configuration needs to be installed.
- Set the dipswitch on the MOI to match the configuration file.
- All other CZone modules must have the dipswitch set to same as the configuration file. The example below shows a dipswitch setting of 01101100 where 0 = OFF and 1 = ON

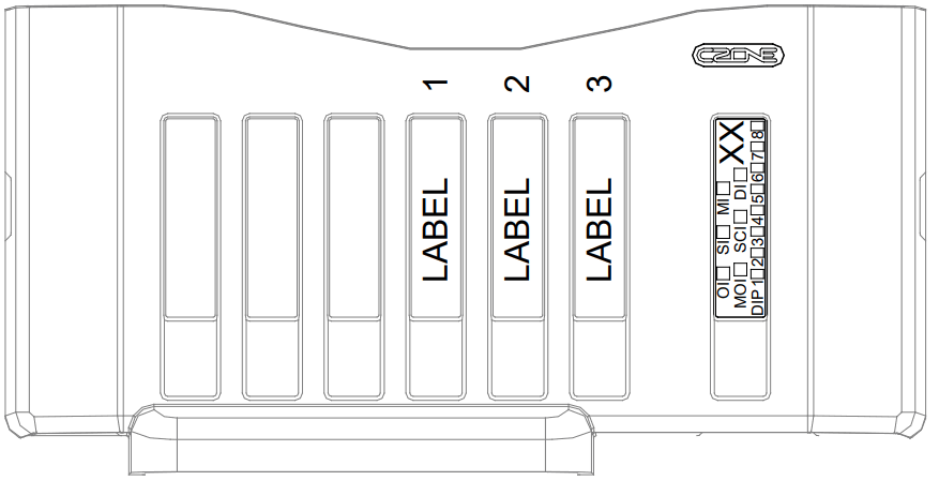


Setting Dipswitch

IMPORTANT – Each CZone device must have a unique dipswitch number and the dipswitch of the device must match the dipswitch set in the configuration file.

CIRCUIT IDNETIFICATION LABELS

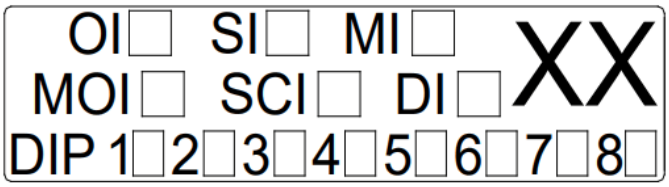
Standard BEP circuit breaker panel labels are used to indicate the circuit name for each output



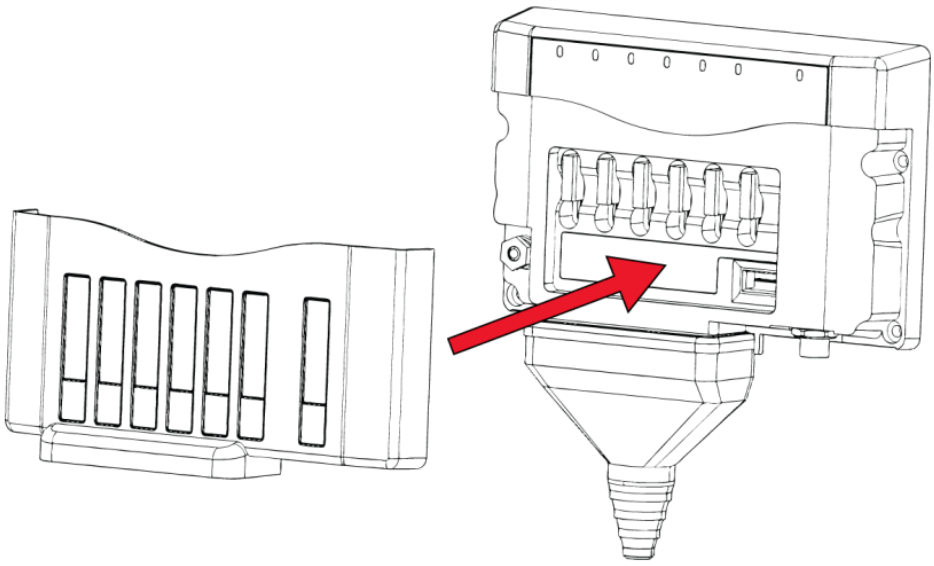
MOI Labels

MODULE IDENTIFICATION LABEL

These labels allow easy identification of each module whilst recording the dipswitch setting. These labels are to be fitted to the cover and to the module (this prevents covers being swapped). To record the module type and dipswitch settings use a permanent marker and strike through the applicable boxes (a strike through on a dipswitch box indicates that switch is on).



FIT THE COVER



Fit The Cover

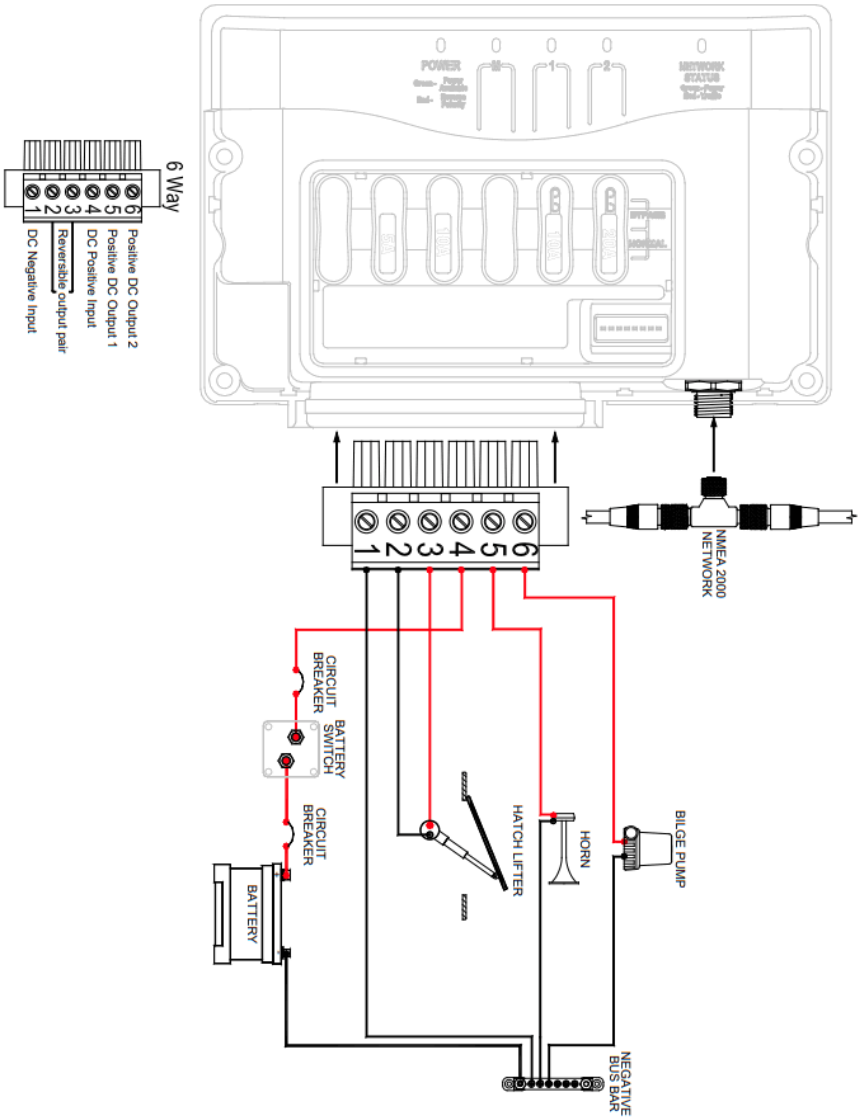
1. Slide the cable gland up the output wires ensuring it is correctly seated.
2. Firmly push the top cover on to the MOI until you hear it click into pace on each side.
3. Ensure the cable gland is still correctly in place.
4. Install circuit labels if you have purchased a label sheet.

WARNING! The MOI is only ignition protected with the cover correctly installed.

INITIAL POWER UP

1. Power up the NMEA2000 Network, system will flash all outputs for a short time while booting.
2. Check that the Network Status LED lights up. It may also be flashing if other devices are on the network and transmitting data.
3. Turn the switch/circuit breaker on supplying power to the input stud (if fitted).
4. Check the software version on the MOI with the CZone Configuration Tool and update if necessary.
5. Write the configuration file to the network (Refer to the CZone Configuration Tool Instructions for details on how to write a CZone configuration file).
6. Test all outputs for correctly configured functionality.
7. Check the circuit status LED's for each individual circuit. Refer to LED codes to diagnose any faults which need to be rectified.

SYSTEM DIAGRAM EXAMPLES



ORDERING INFORMATION

Part Numbers and Accessories

Part Number	Description
80-911-0007-00	CZONE MOI C/W CONNECTORS
80-911-0008-00	CZONE MOI NO CONNECTORS
80-911-0041-00	TERM BLOCK OI 6W PLUG 10 16 PITCH
80-911-0034-00	SEAL BOOT for CZONE OI 6W CONN BK SILICON

SPECIFICATIONS

TECHNICAL SPECIFICATIONS

Technical Specification	
Circuit protection	ATC Fuse with Blown Fuse Alarms
NMEA2000 connectivity	1 x CAN Micro-C port
Output wire range	0.5 – 6mm (24AWG – 8AWG)
Output channels	1x 20A H-Bridge channel 12/24, 2 x 20A Output channels 12/24V
Maximum current	60A Total Module Current
Dimming	Output channels, PWM @100Hz
Power supply	M6 (1/4″) Positive Terminal (9-32V)
Network Supply voltage	9-16V via NMEA2000
Circuit bypass	Mechanical Fuse Bypass on all Channels
Ingress protection	IPx5 (mounted vertical on bulkhead and flat)
Compliance	CE, ABYC, NMEA, ISO8846/SAEJ1171 Ignition Protected
Power consumption max	85mA @12V
Power consumption standby	60mA @12V
Warranty period	2 years
Operating temperature range	-15C to +55C (-5F to +131F)
Storage temperature range	-40C to +85C (-40F to +185F)
Dimensions W x H x D	202.5 x 128.5 x 45mm (7.97 x 5.06 x 1.77”)
Weight	609g

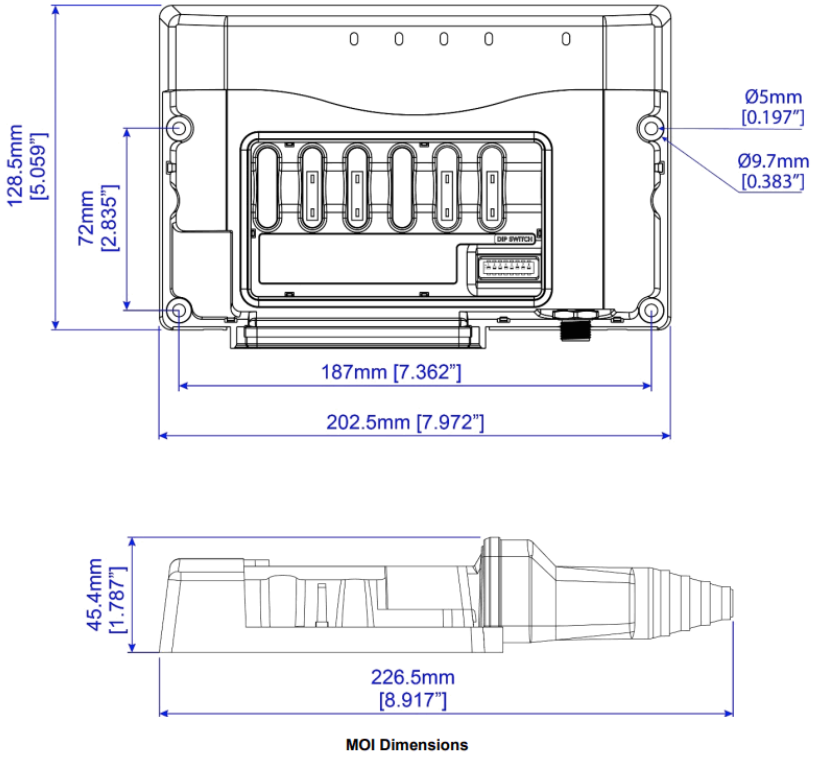
EMC RATINGS

- IEC EN 60945
- IEC EN 61000
- FCC Class B
- ISO 7637 – 1 (12V Passenger cars and light commercial vehicles with nominal 12 V supply voltage – Electrical

transient conduction along supply lines only)

- ISO 7637 – 2 (24V Commercial vehicles with nominal 24 V supply voltage – Electrical transient conduction along supply lines only)
- IEC Standards for indirect lighting strikes

DIMENSIONS



MOI Dimensions

Declaration of Conformity
EU declaration of conformity

Name and address of the manufacturer.	BEP marine Ltd

This declaration of conformity is issued under the sole responsibility of the manufacturer.
Object of Me declaratan:
Czone MOI (Motor Output Interface)
The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

- 2011/65/EU (RoHS directive)
- 2013/53/EU (Recreational Craft Directive)
- 2014/30/EU (Electromagnetic Compatibility Directive)

References to the relevant harmonised standards used Of references to the other technical specificaticos in relation to which conformay IS declared:

- EN 60945:2002 Maritime navigation and radiocommunication equipment and systems
- ISO 8846:2017 Small craft — Electrical devices — Protection against ignition of surrounding flammable gasses (ISO 8846:1990) EU Type Examination certificate # HPiVS/R1217-004-1-01

Auckland, New Zealand – 29th April 2019
BEP Marine LTD

B. E. P. MARINE LIMITED
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Documents / Resources

	CZONE Motor Output Interface [pdf] Installation Guide Motor Output Interface, Motor Interface, Output Interface, Interface

Manuals+,