

Motorised Battery Switch

Model: 720-MDVSO 12/24V Voltage Sensitive Switch
OPERATION AND INSTALLATION INSTRUCTIONS

BEP
LEADING ELECTRICAL DESIGN



INTRODUCTION:

The 720-MDVSO (VSS –Voltage Sensitive Switch) automatically senses voltage and provides optimal, efficient charging of a second independent battery bank. The VSS allows the battery banks to be combined or isolated based on the presence of a charging source (such as an engine alternator or battery charger), while also offering remotely activated, high current, emergency parallel connection of the banks.

Designed and constructed for longevity in the marine environment with tinned copper conductors, stainless steel nuts and high temperature, fiber reinforced plastics. The units are ignition protected, provide On/Off switching operation, and may be recessed or surface mounted.

The 720-MDVSO features digital circuitry and optical sensor positioning that automatically senses 12V or 24V input, is extremely accurate, and offers low power consumption.

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Remote emergency parallel VSS control is achieved by using a remotely mounted momentary switch, such as the BEP #80-724-0007-00 unit (pictured at right), which also features an LED to show the VSS status. When operated, the remote switch engages the 720-MDVSO contacts, paralleling the batteries, for a 10 minute period, for example to get an engine started following a flat start battery.

Alternatively, the VSS can be manually overridden to either "Manual On", or "Manual Off" modes.

SPECIFICATIONS:

- **Continuous rating:** 500 Amps DC -minimum 2x95mm² (2x 3/0) cables
- **Intermittent rating:** 700 Amps DC -minimum 2x95mm² (2x 3/0) cables
- **Cranking rating:** 2500 Amps DC -minimum 2x95mm² (2x 3/0) cables
- **Maximum Voltage:** 32 Volts DC (12V or 24V systems)
- **Voltage Note:** Both battery banks must be the same voltage, either 12V or 24V
- **Operating Voltage:** 8 to 30.5 Volts DC
- **VSS Engages:** 13.3V (26.6V)
- **VSS Disengages:** 12.7V (25.4V)
- **Sensing:** Senses voltage on both battery banks
- **Operation:** Manual On/Off, Auto On/Off
- **Mounting:** Recessed or surface
- **Ignition protected** Meets UL 1107 standards
- **IP Rating** IP65
- **Stud Size:** 2 x 12mm (1/2") –See Installation section for torques
- **Materials:** Tinned copper conductors/studs, stainless steel nuts, high temperature fibre reinforced plastics
- **Power draw:** Off/Auto Off: 5mA @12V, 5.5mA @24V
- **Auto On/On:** 8.3mA @12V, 12.5mA @24V
- **Emergency Parallel:** Remote switch activates parallel for 10 minute period
Pressing remote switch for 6 seconds, deactivates parallel function.

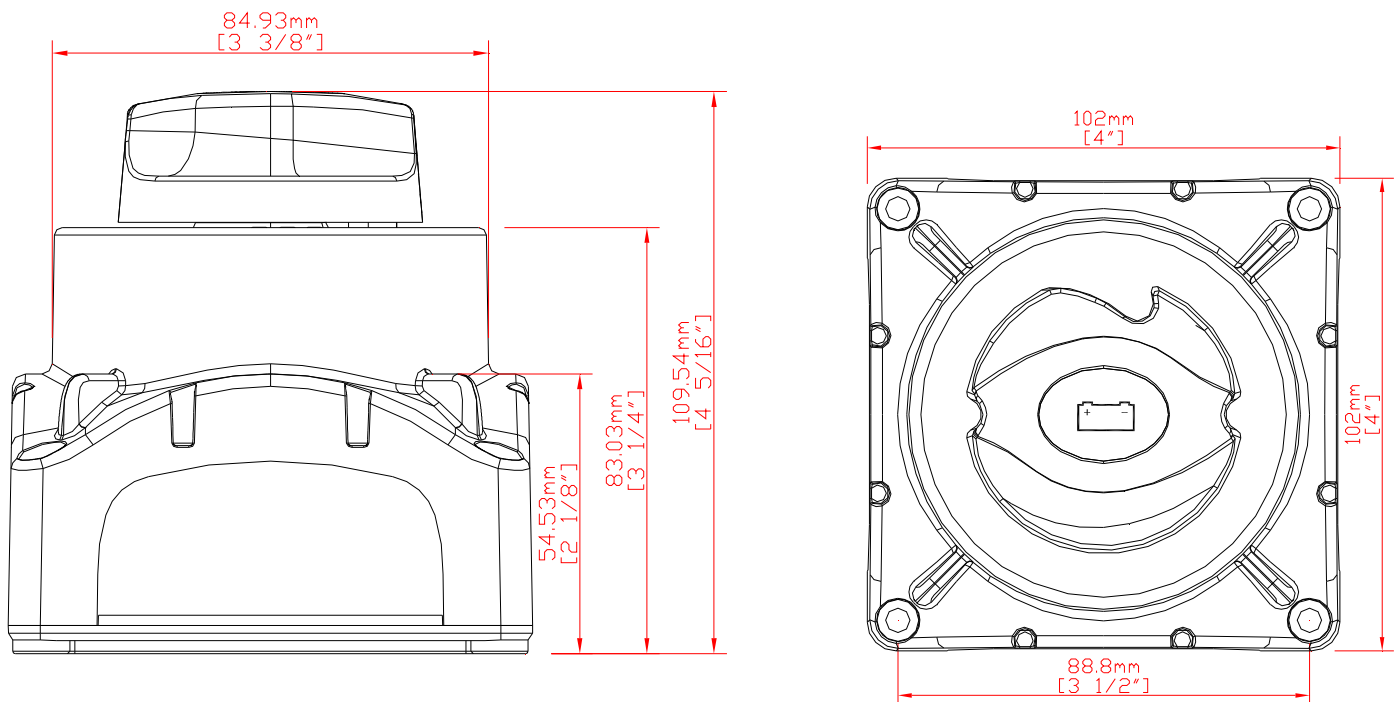
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Feature or Specification	New 720-MDVSO	720-MDVS, 720-MDVS-24V	New MDVSO Comment
Automatic Dual Voltage 12/24 Volt	✓	No	Handles either 12 or 24 volt, with no setup required
Dual Sensing Both Battery Banks	✓	✓	Parallels battery banks if either bank is sufficiently charged
Digital Circuitry, Optical Position Sense	✓	No	Improved accuracy and efficiency
Standby Power Consumption (VSS "Off")	<5 mA (<5.5mA)	15 mA	Approximately 70% reduction in power consumption @12V
Continuous Power Rating	500A	500A	
Intermittent Rating	700A	700A	
Cranking Rating	2500A	2500A	
LED Status Light On Unit	✓	✓	
Optional Remote LED Status Light	✓	✓	
Cut-In voltage (batteries are paralleled)	13.3 V (26.6 V)	13.7V (27.4V)	720-MDVSO cuts in after ~5 seconds
Cut-Out voltage (batteries are isolated)	12.7 V (25.4 V)	12.2-12.8 V (24.4-25.6V)	720-MDVSO cuts out after ~20 second delay
Same 3 Wire + 2 Stud Connections	✓	✓	Ground, remote parallel switch, remote status LED
10 Minute Remote Emergency Parallel	✓	✓	(If remote parallel switch is fitted)
Ignition Protected	✓	✓	
Full Manual Over-Ride (On & Off)	✓	✓	

DIMENSIONS:



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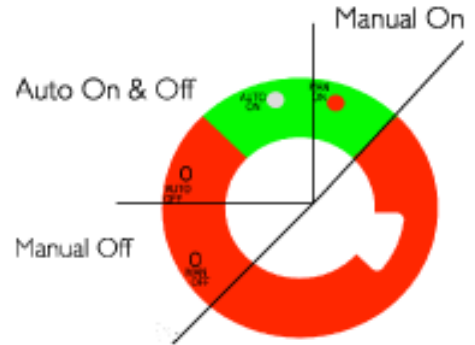
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GENERAL OPERATION:

Note that the knob must be firmly depressed prior to manual rotation, in order to disengage the motor drive. Failure to do this could damage the motor drive.

The VSS Battery Switch, (720-MDVSO) has two modes of operation, Auto and Manual. There is an LED located on both the battery switch and the optional remote key switch, indicating battery switch status.



AUTO OPERATION:

The switch moves between the “Auto Off” and “Auto On” positions depending on the battery voltages, on either battery bank.

Switches “Auto On”: Volts >13.3V (26.6V)

Switches “Auto Off”: Volts <12.7V (25.4V)

following a 20 second delay

Over-Voltage:

If voltage reaches 16.0V (or 30.5V on a 24V system), the VSS will immediately switch to “Auto Off”, and the LED status light will flash rapidly. Normal Auto Operation will only resume when voltage has returned below the over-voltage limit.

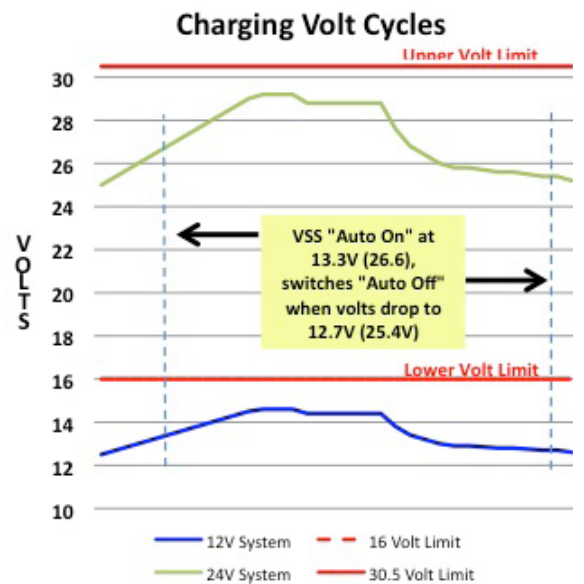
Auto operation of the Battery Switch is not possible whilst in manual mode. Knob must be returned to “Auto Off” or “Auto On” before normal automatic operation can continue.

Auto Mode LED Indications:

LED Off: Battery switch is Off

LED On: Battery switch is On

Rapid LED Flash: Over/under voltage condition



MANUAL OPERATION:

The automatic operation of the 720-MDO battery switch can be overridden at anytime by depressing the control knob and turning clockwise towards the “Man On” position, or counter clockwise towards the “Man Off” position.

During the time that the Battery switch is in “Man On” mode, the LED is illuminated. And the “Man On” symbol is visible (See above).

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INSTALLATION:

Battery cables must be correctly selected for the maximum loads expected.

Cables must be a minimum of 1x 95mm² (3/0) to achieve 350 amps continuous.

Cables must be a minimum of 2x 95mm² (2x 3/0) to achieve 500 amps continuous.

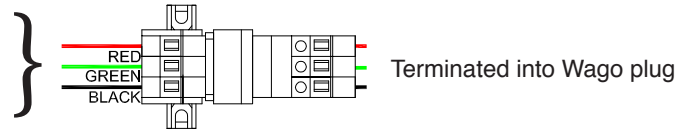
Ensure nuts on studs are correctly tightened. Recommended torque is 18 Nm (13.3 lbf). Maximum torque 25 Nm (18.5 lbf).

Any momentary on/off remote switch can be used to activate the 720-MDVSO.

When first connected to a battery, the VSS will go through a power up sequence which takes approximately 30 seconds to complete. This will be accompanied by rapid flashes on the LED, during which the VSS will detect whether it is part of a 12 volt, or 24 volt system. This may also occur if a 12 volt system reaches and sustains voltage above 16.0V. In this situation, if in the "Auto On" position, the VSS will immediate switch to "Auto Off", and with the voltage >16V, the VSS will change into 24 volt system mode. If voltage is not sustained above 16V, the VSS will return to 12V mode.

WIRES FOR CONNECTION:

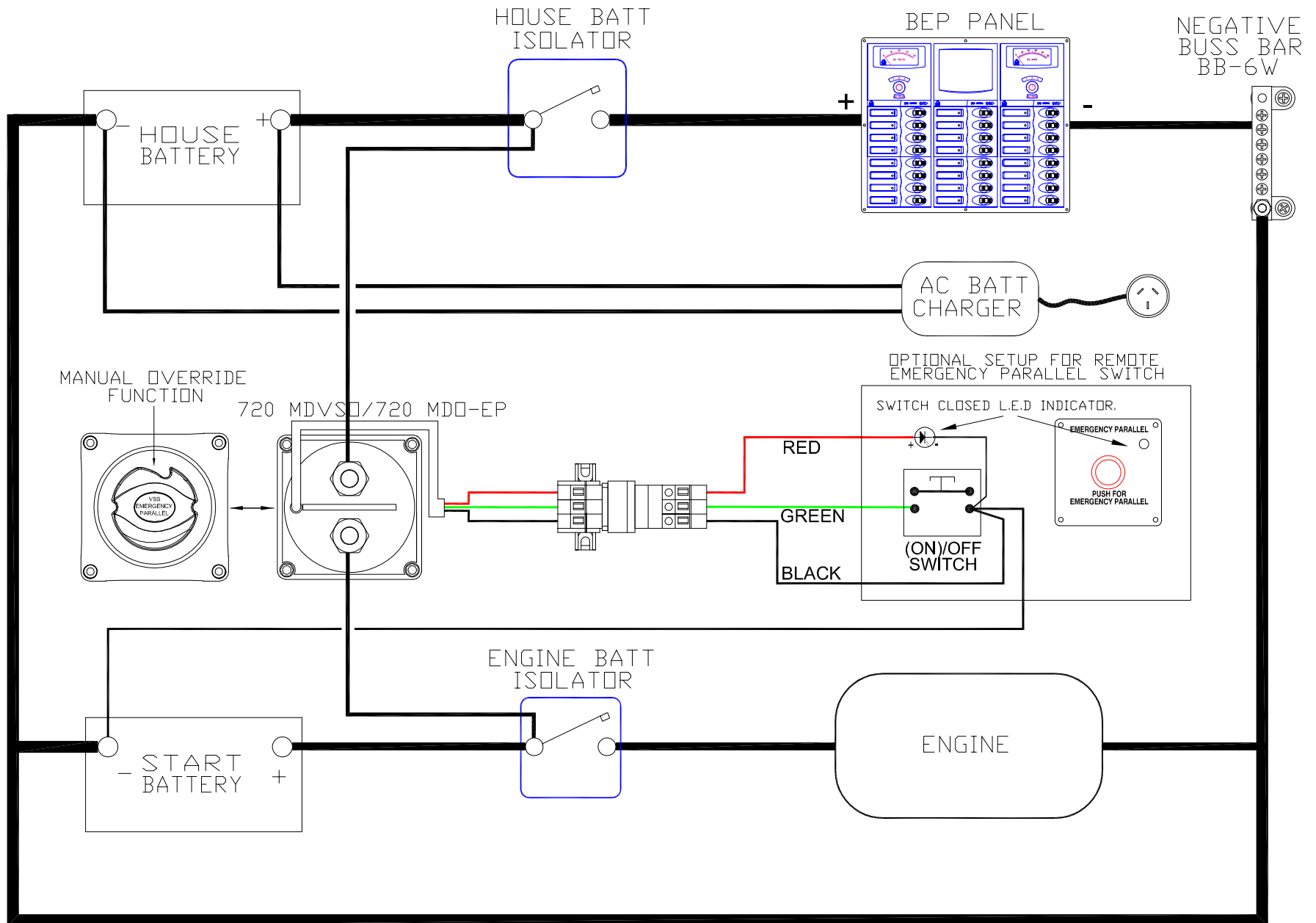
- Red** • Optional LED Wire
- Green** • Optional From Remote Switch
- Black** • Supply Negative



- Input Stud** • High Current Connection From Battery 1
- Output Stud** • High Current Connection From Battery 2

STANDARD INSTALLATION DRAWING:

(Provided as a guide for installation of the 720-MDVSO and 720-MD-EP only, not a complete system design)



IT IS IMPERATIVE THAT THE NEGATIVE (BLACK) FOR THE MDVSO/MD-EP IS TAKEN FROM THE SAME BATTERY THAT IT IS ISOLATING. FAILURE TO DO THIS WILL CAUSE THE UNIT TO WORK ERRATICALLY. ONLY ONE NEGATIVE MUST BE SUPPLIED TO EACH UNIT FOR CORRECT OPERATION.

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CUT OUT MEASUREMENTS (NOT TO SCALE)

