

IMPORTANT! It is recommended that the DVSR is fitted by a qualified marine/automotive electrician. Please follow the installation instructions supplied. If installation is not correct, the unit may not perform to its designed potential. If in doubt, consult your local dealer. It is the installer's sole responsibility to install and use this product in a manner that will not cause accidents, personal injury or property damage. Marhco/Mastervolt/BEP disclaims all liability for any use of this product that may cause accidents, damage or be a violation of any laws.

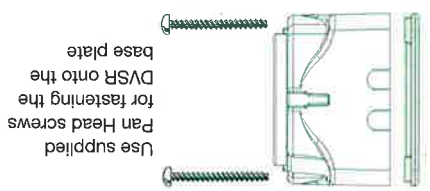
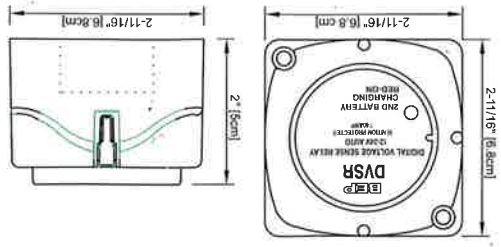
Optional Storage Mode: This can be used where the boat/vehicle is stored for long periods without any battery charging, but with the batteries still connected. Power consumption is zero when this is activated. Alternatively, the storage mode can be wired via the ignition switch, so the DVSR can only operate when the engine is running. This provides optimal protection of electronics from electrical spikes, zero power consumption when Ignition is off, and acts like a single sensing VSR as DVSR will only activate when engine alternator is charging.

Isolation: When the DVSR senses that batteries are not being charged (voltage drops to 12.8V DC or 25.6V DC) the DVSR deactivates following a 20 second delay, separating the combined battery banks into two isolated banks.

DVSR Operation Explained - Charging: The DVSR is connected between two battery banks. When the DVSR senses a charging voltage (13.4VDC or 26.8VDC) on either of the banks, it automatically activates and joins the two battery banks after a short delay (5 seconds), so they are charged as one battery bank.

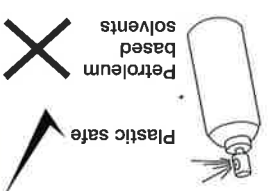
Specifications
 Current: 125 Amps Continuous, 140 Amps Intermittent
 Ignition Protected UL 1107
 Auto Voltage Sensing 12VDC or 24VDC (max 32VDC)
 Power Consumption (Standby) 1.8mA (1.6mA at 24 VDC)
 Power Consumption (Storage Mode) 0mA
 Cut In/Cut Out Voltages 13.4V (26.8V) / 12.8V (25.6V)

If a larger cable cut out is required cut or drill out the wall sections taking care not to damage the circuit board. Do not cut into the clear, soft circuit board protecting membrane.



Mounting

has been designed to be water resistant but is not designed to be partially or fully submerged. The main studs have been fitted to inhibit corrosion (petroleum base grease may be used on these for further protection, but should not be used on plastic parts).



IMPORTANT! Read before installing Use only "plastic safe" corrosion inhibiting sprays. Do not wipe solvents/petrochemicals onto any plastic part of the DVSR. These units are fully sealed so do not require any other form of water proofing. The DVSR

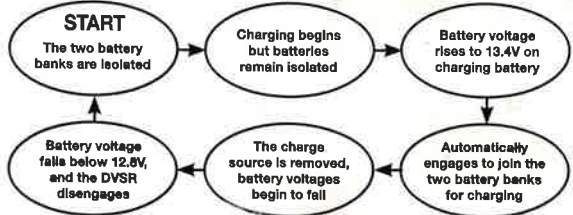
Dual battery charging made easy!

- Automatically charges a second battery bank from any single charging source
- Alternatively, can be used to supply loads, which are only powered when a charging source is operating

Features and Benefits

- Very low power consumption (<2mA)
- Multi-voltage, auto selects between 12VDC or 24VDC
- Digital technology for high efficiency and accuracy
- Dual battery bank voltage sensing
- Output for optional remote mounted status LED
- Optional switching circuit activates DVSR or switches it to zero power consumption storage mode
- Protects start batteries from becoming flat
- High capacity (140A) design allows full alternator charging of heavily discharged batteries
- Ignition protected

DVSR Operation (Shown for 12V System)



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VSR DIG 12/24V MC20



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Operation and Installation Instructions

System Voltage	12V DC	24V DC
Engages	13.4V DC	26.8V DC
Disengages	12.8V DC	25.6V DC

Connections:

Locate DVSR to minimize cable lengths and ensure all cables are sized correctly for minimum voltage drop (see table below). Voltage drop will decrease effectiveness of the DVSR, reduce charge efficiency, and could damage the DVSR and surrounding devices through excessive heat build-up. Ensure all connections are tight and suitable for the installation. Use a neutral cure sealant to seal any cut cable ends.

DVSR Cable Voltage Drop Table

Total Cable Length (m)	Total Cable Length (ft)	Amps	Voltage Drop (%)	Cable Size mm ²	Cable Size AWG
1	3	125	3	6	10
2	6	125	3.5	10	7
3	9	125	3.4	16	5
4	12	125	2.6	25	3
5	15	125	3.3	25	3
6	18	125	3.9	25	3
7	21	125	4.6	25	3

Alternator Vs Battery Bank Size:

The charging alternator's amperage output should be between 20% and 35% of the battery bank size in Amp Hours. e.g. 220AH bank = 44 - 77A alternator

NOTE: Alternator size must not exceed 140A, or 125A if alternator is "hot rated" with a 3 stage regulator

Start Batt Positive + (Large stud marked red): Connects to the battery (Live) side of the Start Battery Isolator Switch

House Batt Positive + (Large stud): Connect to the battery (Live) side of the House Battery Isolator Switch

Negative (Black wire): Connect to battery negative (ensure both battery banks share common negative, see diagram)

Optional Remote LED indicator output (Orange wire):

Connect to negative leg of LED, connect the LED positive leg to fused 12V positive supply. For 24V supply, use a 2.2K (1/4W) resistor on positive supply.

Optional Ignition Control/Storage Mode (red wire):

Cut end of the red looped wire (off end closest to "House Batt Positive +" stud) where it joins the PCB/potting, connect the remaining tail to the ignition terminal on the engine ignition/start switch. With this feature selected the DVSR will only operate when the ignition key is in the "ON" position (i.e. engine running). With the ignition switch "OFF", current draw of the DVSR will be zero Amps.

Optional Storage Mode:

Cut the red looped wire (as detailed above in 'Ignition Control') then connect to the output from an ON/OFF switch. Connect the input of the switch to a fused positive supply (+ 8-32V DC). With the switch in the ON position the DVSR will operate as normal. With the ON/OFF switch OFF, the DVSR will not operate and the DVSR current draw will be zero Amps.

DVSR Power Supply:

The DVSR takes its power supply from the red paint marked stud (Start Batt Positive +) for standard installations. When the optional Ignition Control/Storage installation is chosen, the DVSR power supply is supplied via the fused secondary supply and switch, to the DVSR's red looped wire. With the switch (or ignition switch) turned off, the DVSR cannot activate.

12/24 Volt Selection, and First Powering:

When the DVSR is first powered, it will sample the power supply then decide whether to enter 12 volt (7-15.9 volts), or 24 volt (16 - 32 volts) mode. LED will flash rapidly while this occurs. Please double check voltage in case batteries are flat, or another power source (e.g. solar panel) is affecting the voltage. Once the 12 or 24 volt mode is selected, the DVSR will remain in this mode until power is disconnected.

LED codes:

OFF: DVSR is disengaged, battery banks are not connected

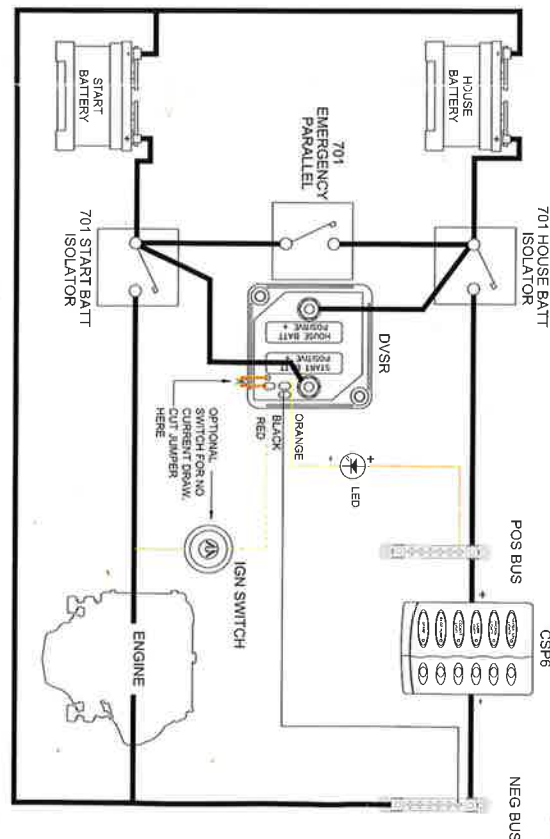
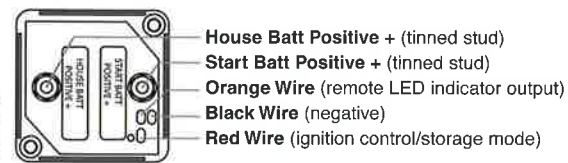
ON: The DVSR is engaged, battery banks are combined

Brief flash every 5 seconds: DVSR is disengaging

Fast flash: System voltage is either too high or too low, check electrical system.

Wiring Diagrams

DVSR Connections



Example System: NOTE - This diagram is a guide only showing DVSR connections and not intended as a full electrical systems wiring diagram.