

BF451-KIT VSR with Cable Kit Instruction Manual

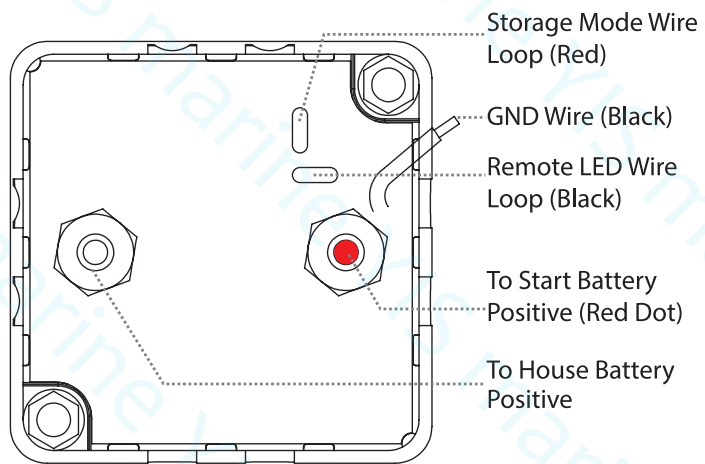
VSR (Voltage Sensitive Relay) are automatically controlled switches that allow two batteries to be combined when charging, and to be isolated when not charging. VSR helps to reserve a fully charged battery at all time, avoid the dead battery and possibility of towing on the sea. This Kit provides all the necessary cables, accessories and the VSR that you need to install the secondary battery with the VSR.

Product Features

- Automatically combines two batteries when charging and isolates the two batteries when not charging
- No voltage drops comparing to battery isolator diodes (0.6V)
- Meets ISO8846 Ignition Protection, suitable for use in engine room
- Robust Glass Fiber reinforced Nylon enclosure
- Built-in LED indication (ON when VSR engages)
- Port for remote LED indicating VSR status (LED not included)
- Surface or panel mount options provides flexibility when installing
- Optional Storage Mode allows zero power consumption when engine is off

Product Specifications

- Nominal Voltage | DC 12V
- Combine Voltage | DC 13.3V
- Open Voltage | DC 12.8V
- Continuous Rating | DC 125A
- Intermittent Rating | DC 140A
- Power Consumption | 10mA (Standby)
330mA(Engage)
0mA (Storage)
- Terminal Studs | M6(1/4")
- Notes | ISO8846/SAE J1171 (Ignition Protected)



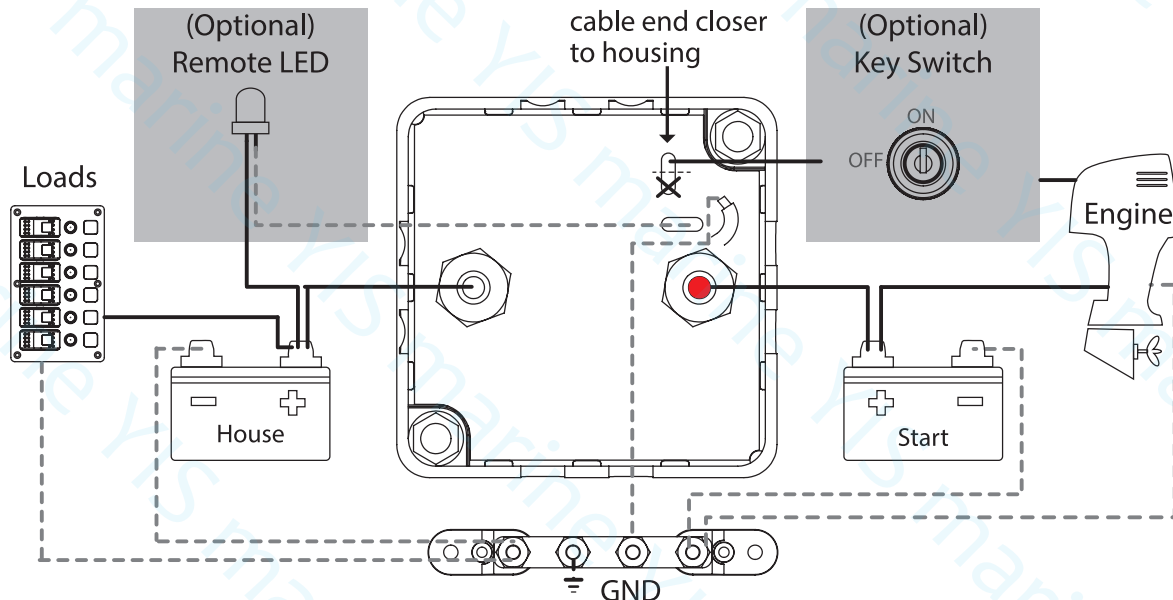
- 1 x VSR (Voltage Sensitive Relay) with mounting screws
- 1 x 6 meter red cable terminated at both ends
- 1 x 600mm black earth cable
- 2 x Positive marine battery terminals
- 1 x Negative marine battery terminal
- 2 x SC16-8 copper crimp lugs (for red cable)
- 1 x SC25-8 copper crimp lugs (for black cable)
- 2 x Red heat shrink
- 6 x 200mm cable ties
- 1 x Instruction manual

Tools required

- Cutting pliers, side cutters or cable stripper to cut and strip the cable
- Crimping or electricians pliers for terminal crimping
- Spanner set or socket set
- Philips screwdriver
- Hairdryer or flame for heat shrink
- Power drill and 3.5mm (9/64) drill bit
- Voltmeter

Installation Instructions

Wiring Diagram:



※ Wiring Diagrams are for reference only, consult professionals for wiring suits your needs.

These instructions assume you have purchased and mounted your auxiliary battery (preferably a deep cycle) in your vehicle.

1. Disconnect the Negative terminal of the Starting Battery.
2. Mount the VSR onto desired location that is easily accessible, not having cables running near exhausts and is as close as possible to the Starting Battery. Use the mounting bottom plate of VSR as template to mark the position of the 4 holes and drill holes. Secure the 2 blind holes of the plate with the short screws included.
3. Take the 6 meter red cable and run the cable from the center of the mounting plate to the positive terminal of the Starting Battery (be careful to keep the wiring away from any moving parts). Cut the cable to length.
4. Use the rest red cable to repeat the above process to the positive terminal of the Auxiliary Battery.
5. Strip the un-terminated ends of both cables back 15mm, fit the included copper lugs and crimp in place, making sure the connection is secure. Alternatively you can solder the cable to the lug if you wish. Slide the heat shrink over the lug and cable then heat with a flame or hairdryer until secure.
6. Attach the insulated ring terminal to the black wire on the VSR. This is an earth wire and it is important that it has a secure and clean (bare metal) contact. If possible select a nearby bolt or screw that is earthed to the body.
7. Attach both red cables to the VSR and tighten the retaining nuts. The cable from the Start Battery goes to the stud on the VSR with the painted RED dot (ENG). The cable from the Auxiliary Battery goes to the unpainted stud (BAT). Note you will have to cut the notched sections in the VSR housing for the cables to exit.
8. Mount the VSR to the bottom plate and fix with the 2 longer screws.
9. Secure the black earth lead on the VSR to the selected earth point.
10. Fit the included Positive (Red +) battery terminal and the Negative (Black -) battery terminal to the Auxiliary Battery and tighten.
11. Attach the RED lead from the VSR to the positive (+) terminal of the Auxiliary Battery and then secure the cable using the cable ties.
12. Auxiliary battery black earth cable - Select a nearby body bolt or drill an 8mm hole in the inner guard and secure one end of the 61cm (24") black earth cable, make sure to have a secure and clean (bare metal) connection. Attach the other end of the black earth lead to the negative (-) terminal of the Auxiliary Battery.
13. Check if the existing battery terminal has a stud and nut on the terminal to secure the existing wiring connect to the existing terminal. If not, replace it with the included Positive (Red +) battery terminal. Attach the red cable from the VSR to the positive (+) terminal of the start battery and secure the cable using the cable ties.
14. Reconnect the Start Battery earth cable.
15. **[Remote LED] (Optional)** Cut the black LED looped wire and connect one end to negative leg of a remote LED. Connect 12V power to LED's positive leg; Seal the other end of the cut looped wire with insulation tape or potting.
16. **[Storage Mode] (Optional)** Cut the red looped wire and connect J2 (the end closer to the housing) to the engine start /key switch ("Ignition" terminal)
17. **[Testing]** Test the connections and the VSR following the instructions below:
 - Test for a proper earth on the Auxiliary Battery by placing a voltmeter across the positive (+) and negative (-) terminals and take a reading. Remove the negative (-) probe and place on an earth point on the body or engine (not the point the earth cable is mounted), both readings should be the same. If the readings are not the same check the earth cable has a clean and secure mounting.
 - Start the vehicle's engine; When the Starting Battery's voltage reaches 13.3V the relay will close automatically and allow the auxiliary battery to be charged. The red light on the front of the VSR will illuminate. Check if the Auxiliary Battery is charging by measure its voltage (should >13V).
 - Turn off the engine; Check if the VSR disengages when the start battery's voltage falls below 12.8V. This can take some time so to speed up the process turn on the headlights or leave the door open and interior lights on.