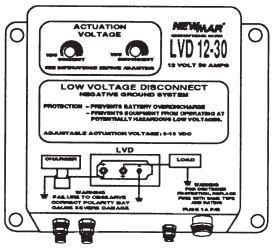
Low Voltage Disconnect

MODELS: LVD 12-30, LVD 12-75, LVD 24-20, LVD 24-50, LVD 48-30



INSTALLATION/OPERATION MANUAL

A) GENERAL INFORMATION

Back-up batteries at communication sites may be damaged by over-discharge when AC power is lost for extended periods. Unless power is restored in a timely fashion, transceivers will continue to draw current from the batteries long after any usable voltage has been drained from them. In some cases, connection to a battery at low voltage damages the transceiver itself.

To protect site batteries and equipment against damage and to help avoid any unnecessary down-time from over-discharge situations, installation of a Low Voltage Disconnect is recommended.

The LVD contains a special sense and control circuit housed in a compact, rugged, vinyl-clad aluminum case. It is installed in-line with the power leads between the battery and the load. The unit continually monitors battery voltage and if it should fall below a preset voltage threshold, the LVD disconnects the load, preventing further discharge. When the battery is recharging and voltage is raised above another preset voltage threshold, the load is automatically reconnected. These connect and disconnect points are user adjustable by means of potentiometers accessible through the front panel.

For questions or comments on Newmar Low Voltage Disconnects, please call 800-854-3906 or e-mail sales@newmarpower.com.

Note: The 12 and 24 volt LVD models come standard from the factory configured for use in negative ground battery systems. The 48 volt model comes standard from the factory configured for use in positive ground applications.

B) INSTALLATION

1) I addition to this manual, the following materials are provided with the LVD:
(1) # 10 ring lug for "SENSE" connection
(2) 1/4" ring lugs for "INPUT" and "OUTPUT" connections
(2) Rubber insulating boots for "INPUT" and "OUTPUT" terminals

2) The LVD should be mounted securely at a convenient location between the battery and the load. Both horizontal and vertical mounting are acceptable. The unit contains a relay which is not ignition protected, therefore it should not be mounted inside of a closed battery box where explosive gases may accumulate. The case is electrically isolated from the input, output and ground terminals so mounting on either a metal or non-metal surface is acceptable.

NEWMAR
DC Power Onboard
www.newmarpower.com

M-LVD1224D
As of January 2008

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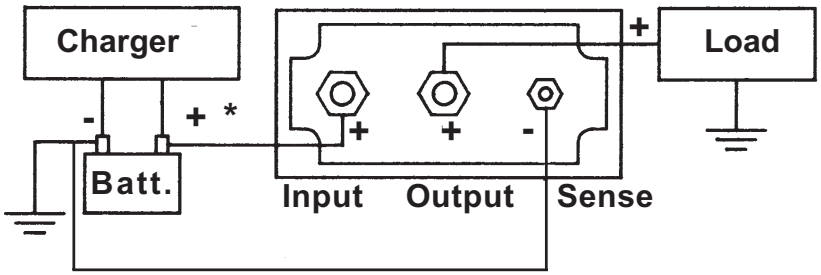
3) *Important: Disconnect the load from the battery before proceeding.*

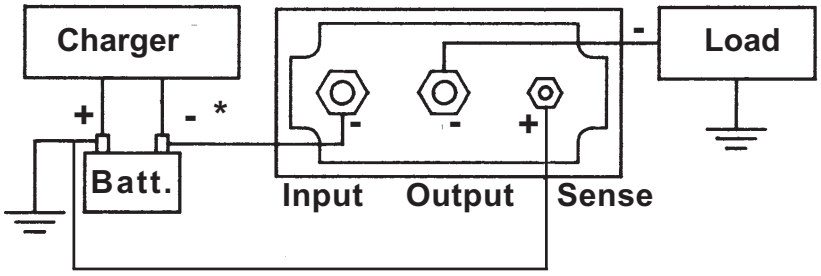
4) Cut the lead between the battery and the load at an appropriate point, slide the supplied rubber boots over the battery and load wires, then strip the wire ends and crimp or solder on the supplied 1/4" ring lug connectors. Attach the newly terminated leads to the LVD as shown in the **WIRING DIAGRAMS**, then slide the rubber boots over the input and output terminals.

WIRING DIAGRAM 1: Negative Ground Models



* *It is recommended to provide over-current fuse or circuit breaker protection on the ungrounded connection as close to the battery as possible.*

WIRING DIAGRAM 2: Positive Ground Models



5) <u>Sense Lead Wiring:</u>

Negative Ground Models - Run a sense wire (14 AWG minimum) from the battery negative (-) terminal to the LVD negative (-) sense terminal. Crimp or solder on the provided # 10 ring lug connector to attach your sense wire to the LVD.

Positive Ground Models - Run a sense wire (14 AWG minimum) from the battery positive (+) terminal to the LVD positive (+) sense terminal. Crimp or solder on the provided # 10 ring lug connector to attach your sense wire to the LVD.

6) Re-attach the lead from the input terminal of the LVD to the battery. Power up the load to verify that it is operating normally. Note: Even if the battery voltage is above the disconnect threshold, the load will not be connected to the battery if the voltage is below the LVD's connect threshold. Recharging of the batteries will first be required if this is the case.

C) ADJUSTING THE "CONNECT" AND "DISCONNECT" POINTS

The LVD is factory set to disconnect and reconnect the load when battery voltage drops below or rises above preset actuation voltages. If the application requires different disconnect and reconnect set points, the LVD may be adjusted. The factory set actuation voltages and the maximum and minimum actuation voltages are listed in the SPECIFICATIONS section.

The voltage range within which the disconnect point may be set depends upon the connect point, with the range

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being smaller at lower connect voltages and larger at higher connect voltages.

The adjustment potentiometers are accessible through two holes on the cover beneath the label “ACTUATION VOLTAGE”. You will need a small slot screwdriver to turn them. Clockwise rotation will increase the actuation voltage; counterclockwise rotation will decrease it. *Note: Setting the connect and disconnect points too close together can cause rapid cycling of the LVD.*

Adjust the connect and disconnect points as follows:

1) Disconnect battery input and any load connected to the LVD.

2) Connect a variable power supply (with output appropriate for 12, 24 or 48 volt applications) to the input and sense terminals. Connect a digital voltmeter to the same terminals.

3) Connect an ohm meter or continuity checker to the input and output terminals.

4) Turn the connect potentiometer fully clockwise. Turn the disconnect potentiometer fully counterclockwise.

5) The connect voltage must be set first. Adjust the power supply voltage until the desired connect voltage is indicated by the digital voltmeter. Slowly turn the connect potentiometer counterclockwise until the relay closes as indicated by the ohm meter or continuity checker.

6) Verify the correct connect voltage by turning the variable power supply down until the relay opens, then slowly raise the supply voltage until the relay closes. If necessary, slightly adjust the potentiometer up or down, then reverify connect voltage. Repeat this process until the desired connect voltage is achieved.

7) Set the disconnect voltage. While the relay is still closed, adjust the power supply voltage until the desired disconnect voltage is indicated by the digital voltmeter. Slowly turn the disconnect potentiometer clockwise until the relay opens as indicated by the ohm meter or continuity checker.

8) Verify the correct disconnect voltage by turning the variable power supply up until the relay closes, then slowly lowering supply voltage until the relay opens. If necessary, slightly adjust the potentiometer up or down, then reverify disconnect voltage. Repeat this process until the desired disconnect voltage is achieved.

D) FUSE PROTECTION

The sense circuitry wiring of the LVD is protected by a 1 amp fast-blow fuse. In the event the fuse is blown or is missing, the input will remain disconnected from the output. The fuseholder is located at the base of the unit beside the wiring terminals. Should the fuse ever need replacing, replace it with the same type and rating for continued protection.

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E) TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
A. LVD disconnects from load too soon-batteries not low.	1. Disconnect threshold set too high.	1. Refer to LVD adjustment procedure (Section C) for readjustment.
	2. Large voltage drop between battery terminal and LVD input terminal.	2. Shorten wire length and/or increase wire size. Check for loose connections.
B. LVD cycles back and forth between connect and disconnect.	1. Connect and disconnect thresholds set too closely together.	1. Refer to LVD adjustment procedure (Section C) for readjustment.
	2. Large voltage drop between battery terminal and LVD input terminal.	2. Shorten and or increase size of wire to decrease voltage drop. Check for loose connections.
C. LVD will not connect load to battery although battery is full charged.	1. One amp sense circuit fuse missing or blown.	1. Replace missing fuse. If blown determine cause before replacing.
	2. LVD out of adjustment.	2. Refer to LVD adjustment procedure (Section C) for readjustment.
	3. Sense wire not connected to LVD.	3. Ensure good connection between battery terminal and LVD sense terminal.

F) SPECIFICATIONS

LVD MODEL:	12 VOLT	24 VOLT	48 VOLT
FACTORY SET ACTUATION VOLTAGES:			
DISCONNECT	10.4 VDC	21.0 VDC	42.0 VDC
CONNECT	12.2 VDC	24.5 VDC	49.0 VDC
MAXIMUM CONNECT VOLTAGE (APPROXIMATE):	15 VDC	30 VDC	60 VDC
MINIMUM DISCONNECT VOLTAGE (APPROXIMATE):	9 VDC	18 VDC	38 VDC
(HYSTERESIS RANGE DETERMINED BY CONNECT VOLTAGE; LOWER VOLTAGE = SMALLER RANGE)			
CURRENT DRAW CONNECTED	.30 A	.22 A	.10 A
CURRENT DRAW DISCONNECTED	50 mA max	50 mA max	50mA max

RELAY CONTACT CONTINUOUS CURRENT RATINGS:
INDICATED BY MODEL NUMBER (e.g., LVD 12-30: 30 AMPS CONTINUOUS)
DIMENSIONS (MOUNTED VERTICALLY, ALL MODELS):
5 1/4 " HIGH x 5 1/2" WIDE x 3 1/2 " DEEP
WEIGHT (ALL MODELS): 1 LB.
OPERATING TEMPERATURE: 0° C to + 50° C

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