



HELLROARING TECHNOLOGIES, INC.

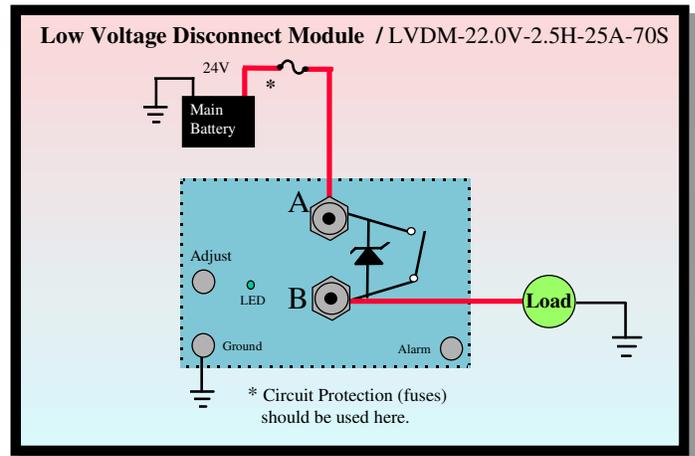
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Low Voltage Disconnect Module LVDM-22.0V-2.5H-25A-70S



The Low Voltage Disconnect Module provides for automatic power up to a load when a voltage source at a sufficient level is applied and for automatic disconnect when the source voltage drops too low. This module has an open collector alarm output that sinks low 70 seconds prior to a power disconnect. This delay allows for equipment to perform any necessary shutdown routines prior to losing power.

The Module has a built-in Hysteresis of about 2.5V. Therefore, it will require the source voltage to rise 2.5V higher than the voltage at which it disconnected. Both Thresholds are adjustable with a single external resistor, but the Hysteresis will remain about the same. Therefore, if the disconnect threshold is adjusted lower, then so will the switch on threshold be adjusted lower.

Caution:

Damage can occur if power is disconnected while power is ON to an inductive load. To minimize any risk of damage, follow the disconnect procedure below.

Disconnect procedure:

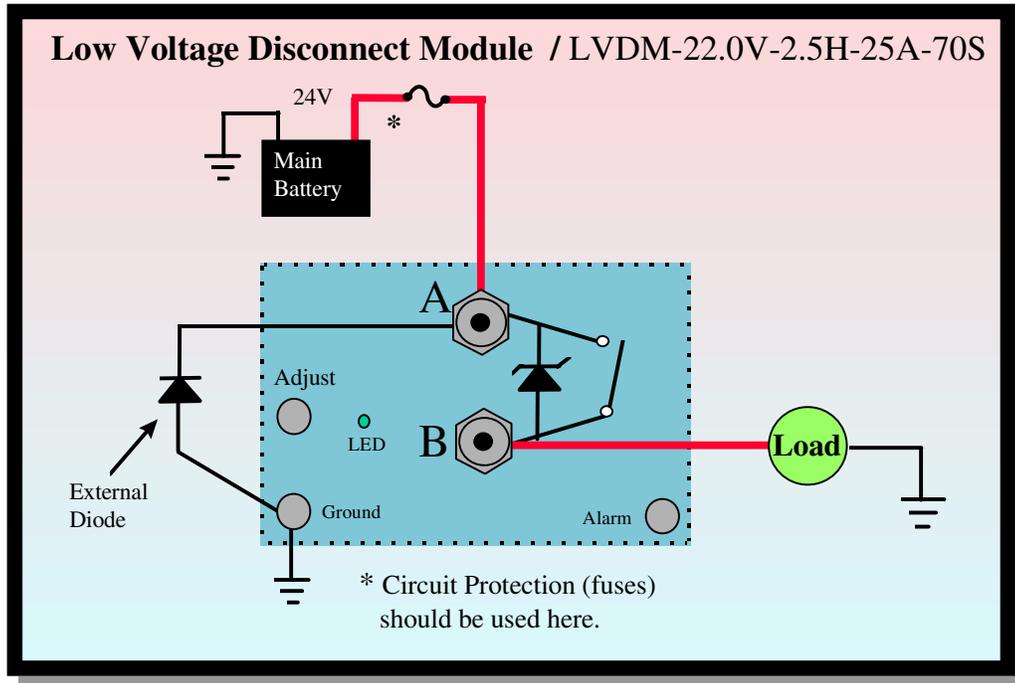
1) Shut down load. 2) Disconnect load. 3) Disconnect power.

Alternative disconnect procedure:

1) Apply < 10K resistance from Adjust terminal to ground. 2) After LED extinguishes, disconnect power.

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If this procedure can not be adhered to, then it is recommended to always connect an external diode (such as 1N4003) from terminal A to ground as shown in the following diagram.



For the least risk of damage, use the external diode and also follow the disconnect procedure above.

The LVDM-22.0V-2.5H-25A-70S has five terminals. 1) Terminal A - Power input terminal (Nominal 24V+) for the battery input voltage. 2) Terminal B - Load output terminal. The load connects to this terminal. 3) Ground - This terminal connects to the common ground (battery neg). 4) Alarm - This provides the open collector drive transistor. Limit currents to less than 50 mA on this terminal. 5) Adjust - This terminal can be used to adjust the threshold levels if desired. Connect a resistor from this terminal to A to lower the threshold levels. Connect a resistor from this terminal to ground to increase the threshold levels.

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Specs:

LVDM-22.0V-2.5H-25A-70S:		Unless specified otherwise, ambient temp=25C ; max current from terminals "A" to "B".
Max voltage	+36 Volts	+A to -B With built-in transient suppressor
Recommended operating voltage	+20 to +32Vdc	
Absolute Max ON Current	25 Amps	100% duty cycle 65C ambient to 30 Vdc Natural Convection.
	50 Amps	40% duty cycle, to 3 minutes max duration, 65C ambient, to 30 Vdc, Natural Convection
	100 Amps	10% duty cycle, to 30 seconds max duration, 65C ambient to 30 Vdc. Natural Convection
Max On resistance (@ 1 amp)	0.002	Ohms (A to B)
Control Input	Automatic	Automatic power up after some delay
Quiescent current	< 500uA	When Output Disconnected
Switch on transient time Tr	< 5 mS	
Switch off transient time Tf	< 300 uS	
LED	Illuminated	When output is ON.
Output	Unidirectional DC	Observe proper power and load polarity
Automatic start up threshold	> 24.5V	+/- 0.3V after no less than 1 second after a shutdown has been released.
Automatic Disconnect threshold	< 22.0V	+/- 0.3V . Once triggered, the alarm output is set and a 70S timer started. Disconnect occurs after the 70 second time out even if the voltage returns to above the start up threshold.
Alarm output:		
Max voltage	40V	
Max current	50mA	
Delay	70S	+/- 10S. Output low for 70S prior to shutdown. (Delay time can be custom ordered for different values.)

Should you have a specific application or question not covered here, feel free to send an e-mail technical support request. Include as much detail as practical regarding your application. Send to: sales08@hellroaring.com. Or check our website for the current e-mail address.

Note: Specifications are subject to change without notice.

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Standard Terms and Conditions of Sale

The sale of Hellroaring Technologies, inc. products shall be governed by the laws of the state of Montana. All sales shall transfer title within the state of Montana via common carrier. Hellroaring Technologies, inc. will not collect sales taxes for any other state. Should the unlikely event, a cause of action arises, buyer agrees that such action shall be held and governed in the state of Montana. The buyer recognizes that there exists inherent risks associated with batteries and installation & operation of battery devices. It is understood that any technical information published by Hellroaring Technologies, inc. including any installation instructions is of a general nature only and it is the user's responsibility to determine the proper application, installation, and operation of products. The buyer assumes all risk and agrees to indemnify Hellroaring Technologies, inc. against any and all causes for injury or damage to third parties that arises from use of such product.

Return Policy

Should any single unit product sold by Hellroaring Technologies, inc. not meet or exceed your expectations, you may, within 30 days of our shipment to you, return such product for a full refund (credit on credit card orders) less a 15% restock charge, provided that:

- a) You obtain an RMA number and provide your shipping address by calling customer service at 406 883-3801 or send an RMA request via e-mail (include the model #, serial number, and your phone number), and
- b) The product, including all accessories, is returned in original and re-saleable condition, and
- c) Units are Shipped (prepaid and insured for damage in transit) in the original or equivalent packaging, and
- d) (optional) You include a simple note as to the reason for dissatisfaction. (This can help us improve our products)

For quantity or custom orders, sales are final and our standard limited warranty applies.

Limited Warranty

This Limited Warranty is extended to the original purchaser. Hellroaring Technologies, inc. warrants that our SSR products will be free from defects in materials and workmanship upon delivery. All claims for defects must be made within 30 days of delivery. The sole and exclusive remedy for failure of the product shall be for us, at our option, to repair or replace the product, to whatever extent we deem necessary to restore the product to proper operating condition. We may make replacements with new or functionally equivalent products of equal value. Should Hellroaring Technologies, inc. be unable to repair or replace the product within a reasonable time, we reserve the right, at our option, to issue a refund or credit of the purchase price in lieu of repair or replacement. We reserve the right to assess a \$15 fee for units returned and proven not to be defective. To obtain warranty service you must:

- 1) Call Customer Service at 406-883-3801 for a Return Material Authorization (RMA) number and shipping address. Or send an RMA request via e-mail (include the model #, serial number, and your phone number and your return shipping address)
- 2) Return the product in the original or equivalent packaging (Shipping prepaid and insured for damage in transit), together with the RMA number AND a description of the problem. Include your return shipping address and your phone number.

Do not attempt to disassemble, or otherwise tamper with any of the 4 nuts on the bottom of each unit. Doing so will void this limited warranty. For quantity orders, extended warranty for switching applications may be available on an application specific basis at slight extra cost.

Exclusions

This Limited Warranty is made expressly in lieu of and to the exclusion of any and all warranties, express or implied, oral or written, including, without limitation, any and all implied warranties of merchantability or fitness for a particular purpose, and all such other warranties are expressly disclaimed. This Limited Warranty shall not be applicable to failures of the product that result from accident, abuse, misapplication or alteration, improper installation or maintenance, unauthorized repair attempts, operation or attempts to operate it beyond its mechanical, chemical, thermal, or electrical capacity intentionally or otherwise, and we assume no liability as a consequence of such events under the terms of this warranty. Hellroaring Technologies, inc. shall not be liable for any special, indirect, incidental, consequential, exemplary, or punitive damages for claims in any claim, action, suit or proceeding arising out of the purchase, use or performance of the product, and whether or not it has been advised of the possibility of such damages. The foregoing allocation of risk is reflected in the price of the product. Nor shall there be any liability thereunder for claims of labor, loss, profit, goodwill, repairs or other expenses incidental to the repair or replacement of such product.

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