



HELLROARING TECHNOLOGIES, INC.

P.O. Box 1521

POLSON, MT 59860

406 883-3801 [HTTP://WWW.HELLROARING.COM](http://www.hellroaring.com)

SUPPORT@HELLROARING.COM

SSR-4060-200V-12C

The SSR-4060-200V-12C is designed for positive DC load switching (solid state relay) applications for source voltages up to 120 Vdc (200V SSR output rating) and a control voltage input of 12 volts at approximately 20 mA. This unit **does utilize opto-isolation**. Many applications will benefit by the reliable, high current, dc switching capability. The SSR-4060-200V-12C unit can switch either the high side or low side and can be configured for back to back mosfet output at half the current rating and 4 times the on resistance.

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: sales06@hellroaring.com or check our website for a current valid address.

Depending on your power source capability and wire size utilized, appropriate circuit protection should be installed. The following table includes recommendations for wire protection values. In all cases, we recommend using circuit protection no greater than 60 amps.

Wire Size AWG	Circuit protection
8	60 A
10	40 A
12	25 A
14	20 A
16	15 A

The circuit protection listed is for continuous current.

Industrial Switching Applications:

Wire per one of the Load Switching Applications diagram illustrated below. **Diode suppression** for inductive loads is recommended for most applications and should be used even if your load is mostly resistive. Wires still have some inductance. For the H-bridge configuration using 4 units, additional diode suppression may not necessary because it is essentially built-in to the configuration, unless the dc source utilizes a blocking diode. For installation, follow these steps:

- 1) For highly inductive loads, Verify the load has diode suppression installed as illustrated.
- 2) Connect the power source Positive (+) to terminal "A" and "C".
- 3) Connect the load (+) to terminal B. The other side of the load should be connected to the power source common.

The unit is now ready for switching. Apply a 12 volt control voltage (requires 20 mA) to the control signal input as desired and within the limits specified. Do not disconnect the load while the SSR is switched ON.

Note on Diode Suppression

The Hellroaring SSR-4060-200V-12C series have built-in suppression, for slight inductive loads, with dissipation up to 1 Joule, non repetitive or 0.1 Joules repetitive. For higher inductive energy, you will need to use external means to protect the SSR. We recommend a minimum of a 5KW peak TVS for any application.

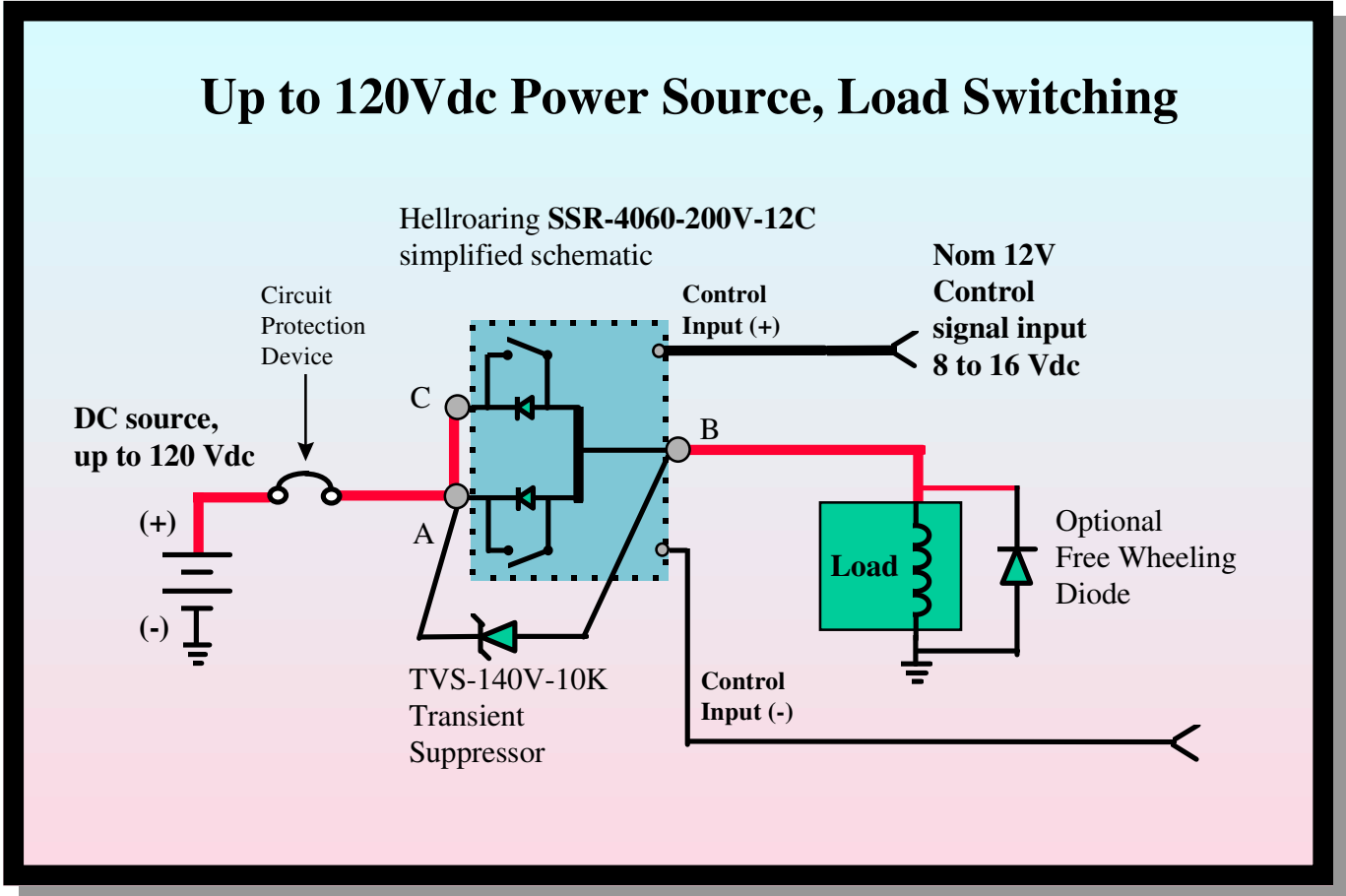


Figure 1

Basic DC load Switching applications.

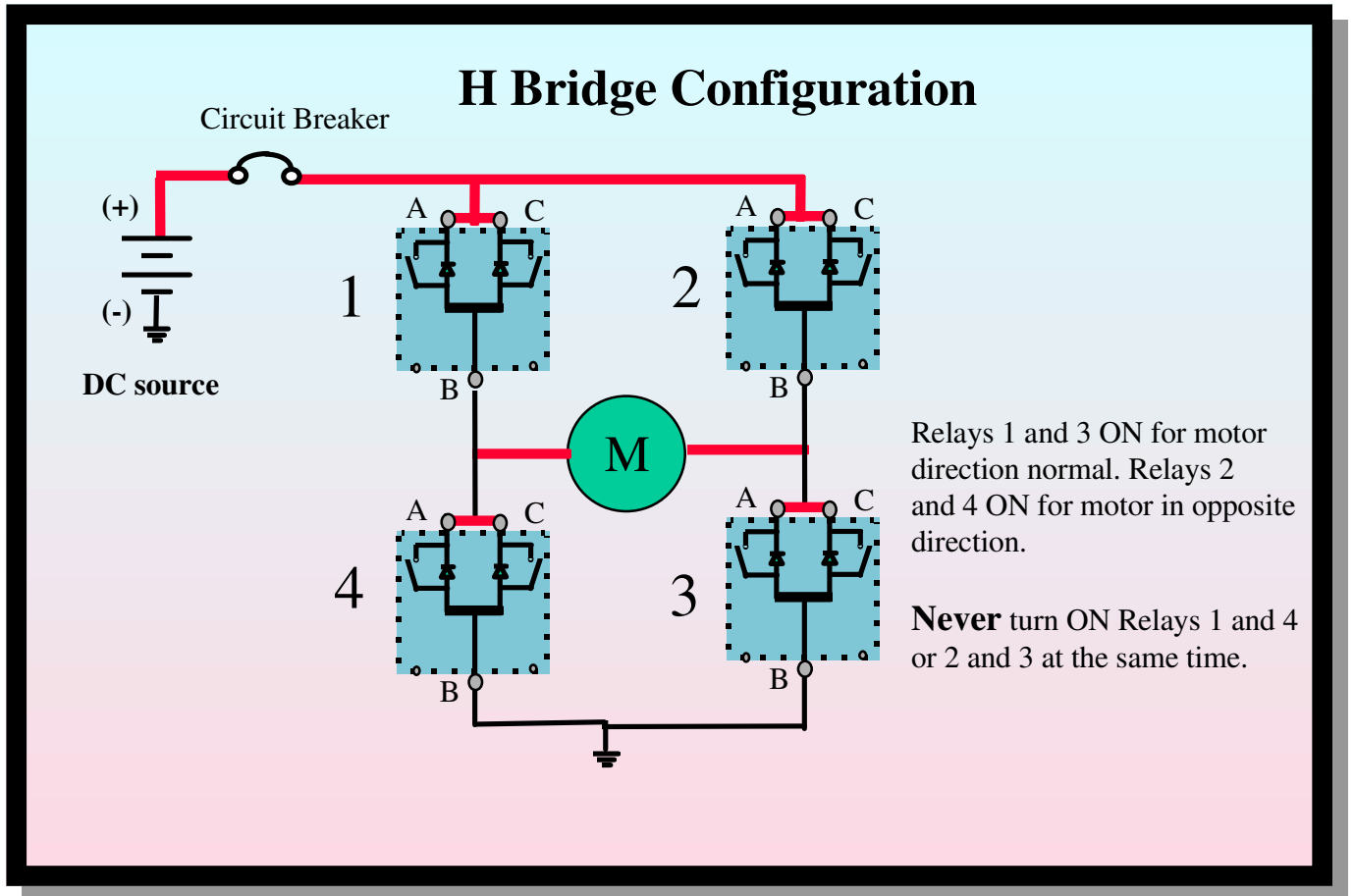


Figure 2

H-Bridge Motor Control.

Some Possible Applications include:

Motor forward and reverse control.

Note: For power sources that have a **blocking diode** (prevents transient energy from flowing back into and dissipating into the DC source), then the transient will be forced to be dissipated into relays 3 and 4. For added transient protection, add transient suppression diodes across relays 3 and 4 rated at voltages of no more than 60 to 70% of the SSR. For the 200V SSR, a 140V TVS works well. And, it should have the power dissipation required for the inductance of the circuit. Battery power sources without blocking diodes (as shown in Figure 2) will dissipate transients into the battery. In this case, an external TVS may not be needed.

Hellroaring SSR-4060-200V-12C Instructions

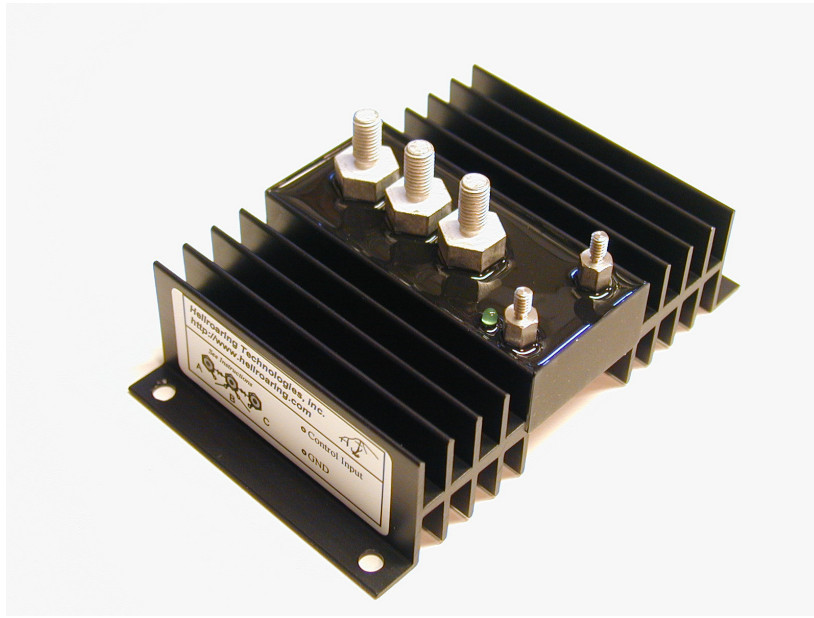
For other applications or possible setups, check our web site <http://hellroaring.com> for additional suggested configurations or other tips. If you have other questions you can send e-mail to sales06@hellroaring.com or check our website for the most current valid e-mail address. Please include your serial number.

Definitions:

Control Input: This terminal, when connected to a voltage of 9 to 16 volts (12V nominal) will cause the terminals A, B, and C to electrically Combine (switch ON). This terminal, when open circuited, will cause the terminals A, B, and C to switch OFF. Input resistance is about 500 ohms resulting in only 0.02 amps with a 12 Vdc control input. The control input voltage (input current) has a direct effect on the turn on time. This is about 3 to 6 mS with a 12 Vdc control input.

Terminals A, B, & C: Terminals A and C are typically jumpered together to obtain the maximum current capability. When Jumpered, terminals A and C must be more positive than terminal B and are normally connected to the power source positive for high side switching (or the load negative for low side switching). Terminal B would normally be connected to the load for high side switching (or to the power source negative for low side switching). Terminals A and C are the cathode end of a diode and terminal B is the Anode.

Dimensions: 4.8" long, by 3.0" wide, by 2.0" to the top of the terminal studs.
Weight: 12 Oz., typical with 6 AWG jumper.



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Specifications:

<u>SSR-4060-200V-12C:</u>		Unless specified otherwise, ambient temp=25C ; max current from terminals "B" to parallel "A" & "C".
Max voltage	200 Volts	continuous
Recommended max source voltage	120 Vdc	
Absolute Max ON Current	40 Amps	100% duty cycle 65C ambient to 120 Vdc source and 12 V control input.
	60 Amps	5% duty cycle 65C ambient to 120 Vdc Source, 12 V control input. Max pulse width 15 seconds.
Max On Resistance (@ 10 amps)	0.01	Ohms terminal "B" to parallel "A & C"
Control Input Current	0.020	Amps (with 12 Vdc input) typical
Switch on transient time Tr	3-6 mS	typical, with 12 Vdc Control input
Switch off transient time Tf	< 0.3 mS	typical

Note: Specifications are subject to change without notice.

Hellroaring SSR-4060-200V-12C Instructions

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 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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