Information Bulletin

Electronics

Printed Circuit Board (PC Board) Terminal Board Connections:

All terminals may not be present on your PC board. See options section of this bulletin.

(+) Positive voltage 12VDC or 24VDC depending on the controller ordered.

(–) Negative side of the supply voltage.

(X) Auxiliary output: Supply voltage is present whenever the controller is turned on. Output current must not exceed 3 amps.

(A) Output terminal to proportional coil when the controller handle is moved in the "A" direction.

(B) Output terminal to proportional coil when the controller handle is moved in the "B" direction.

(C) Common return when high current PC boards are used. The coil's ground or (–) connection ***must be returned to the PC board "C" terminal, not to ground****.*

(R) Range terminal: See Dual Range option.

Most *PC boards have LEDs (Light Emitting Diodes) which can be used for troubleshooting, or simply as an indication of output at a specific terminal. LEDs are located near the "A" and "B" terminals.*

Standard Coil Connections:

Dual Coil:

Two coils or solenoids, with each having at least two connections. One side of the first coil is connected to the PC board "A" terminal, the other side is connected to the negative (–) side of the supply voltage. The other coil is connected to the "B" terminal and the negative (–) side of the supply voltage. Two or more PC boards can be paralleled to operate the same coil.

Single Coil:

Single coil, solenoid, force motor, etc., for bi-directional operation. The coil has two connections; one is wired to the PC board "A" terminal and the other is wired to the "B" terminal. PC boards cannot be paralleled. Relays or switches must be used when two or more controllers are used to control the same coil.

Flow Control:

Single coil or solenoid, for single direction. The coil has two connections; one is wired to the PC board "A" terminal and the other is wired to (–), or the negative side of the supply voltage. Switches to control directional valves may be provided on the controller.

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Adjustment Procedures:

Adjustments are made by turning a trimpot adjustment screw. The trimpots are multi-turn, end-to-end devices. It may be necessary to turn the adjustment screw several turns to observe a change in output.

Clockwise (CW) adjustment of the trimpot increases the output.
Counterclockwise (CCW) adjustment of the trimpot decreases the output.

Adjustments affect output current, voltage or percentage of duty cycle to the coil. The minimum and maximum output is preset at the factory. ***However, for optimum performance, they must be adjusted while the equipment is operating****.*

Although the following adjustments affect the current / voltage or percentage of duty cycle, the best way to adjust the function is to observe the response or speed of the function. The following adjustments affect function response, or speed. There may be some interaction between adjustments, making it necessary to repeat the adjustment in order to achieve the desired response.

"Threshold" Adjustment:

Adjusts the initial current flow or duty cycle, affecting the function response, or speed, when the handle is first moved from the off position. Deflect the handle slowly to the position where the controller first turns on. Adjust the threshold trimpot screw to the point where the controlled function just starts to move, then turn the trimpot screw one full turn in the counterclockwise direction. ***This adjustment should be done first****.*

"Maxout" Adjustment:

Adjusts the full stroke current or duty cycle affecting the maximum function response, or speed, when the handle is deflected to its full travel. Fully deflect the handle and adjust the maxout trimpot for maximum desired function response or speed. To obtain proportional resolution, it is important that the function starts to slow down as soon as the handle is moved back from the fully deflected position.

The ideal adjustment occurs when the function just begins to move when the handle is deflected, and the output increases until it reaches its maximum desired response, or speed, at the end of handle travel.

Options:

Depending on the features ordered, your controller may or may not have the optional features listed below:

Integrated Ramp System (IRS):

Provides smooth function response when reacting to an abrupt change in handle deflection. Clockwise (CW) rotation of the trimpot increases ramp time and slows the response time. Counterclockwise (CCW) rotation decreases ramp time and increases the response time. To increase the ramp time, turn the adjusting screw clockwise a few turns, then move the controller handle abruptly. Continue to adjust until a smooth response is observed. Most controllers have ***on/off*** *contacts which remove power from the PC board when the handle is returned to the "off" position. When the handle is abruptly returned to n utral, the output will* ***not*** *ramp down, and the function will stop.*

Ramp Thru Off:

The PC board should be adjusted as outlined in the IRS adjustment procedure. If the handle is abruptly returned to neutral ("off"), the output will ramp down to off. Ramp time is factory set to two seconds, unless otherwise specified.

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Dual Range:
*When supply voltage is applied to the "R" terminal, the board is in **"Hi Range".** When voltage is not applied to the "R" terminal, the board is in **"Lo Range"**.*

Hi Range Adjustment:
*With supply voltage applied to the "R" terminal, fully deflect the handle. Adjust the **"Hi Range"** trimpot for desired **"Hi Range"** response or speed. Refer to **"Maxout"** adjustment procedures. Whenever the dual range switch or contact is closed, the output should be adjusted for the maximum function response or speed.*

Lo Range Adjustment:
*With no voltage on the "R" terminal, fully deflect the handle. Adjust the **"Lo Range"** trimpot for the desired **"Lo Range"** response or speed. Again refer to **"Maxout"** adjustment procedures. Whenever the dual range switch or contact is open, you are in "Lo Range".*

When changing from "Hi Range" to "Lo Range", a change in function speed should be observed.

Dual Max:
*Allows for separate **"Maxout"** adjustments in each direction of the handle movement. **"A Maxout"** adjusts the maximum output when the handle is moved in the "A" direction, and **"B Maxout"** adjusts the maximum output in the "B" direction. Refer to **"Maxout Adjustment"** for adjustment procedures.*

Troubleshooting Procedures:

Problem:	Procedure:
The function will not operate when the handle is moved. The LEDs do not light.	Check that the voltage is present at the positive (+) input terminal. Check that the ground is connected to the negative (–) terminal. If there is an in-line fuse, check to see if it is good. Check the controller on/off switch and the connectors. Voltage should be present a the "X" terminal when the controller is turned on. Check that valve wiring is not shorted to ground. The LEDs will not light. Check that valve wiring is not open. The LEDs will light, but the intensity will not vary. Check the trimpot settings. Fully counterclockwise (CCW) turns output off, clockwise (CW) turns output fully on.
The function jumps or lurches when turned on.	Perform **"Threshold"** adjustment procedures.
The function reaches maximum speed before the handle is fully deflected.	Perform **"Maxout"** adjustment procedures.
The function speed remains constant regardless of the degree of handle deflection.	Perform **"Maxout"** adjustment procedures.
IRS Option: Function speed reacts too slowly or too quickly in relation to handle deflection.	Check **"IRS"** (ramp) trimpot adjustm nt. Clockwise (CW) increases ramp time, counterclockwise (CCW) decreases ramp time.
Dual Range Option: Controller will not switch between "Hi" and "Lo" range.	Check to see that source voltage is present at the "R" terminal when in "Hi" range, and absent when in "Lo" range. Check trimpot adjustments.

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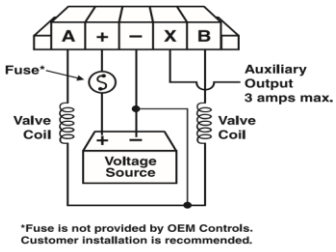
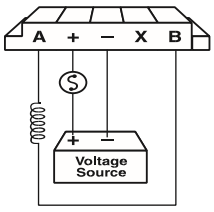
Bulletin #700

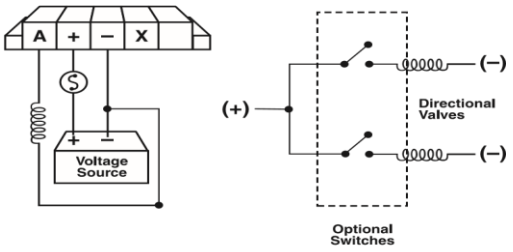
Information Bulletin



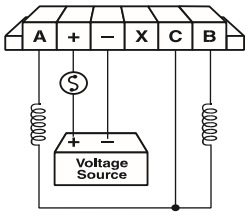
Dual Coil



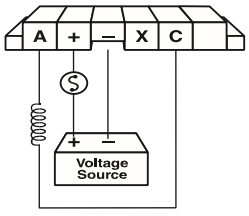
Single Coil



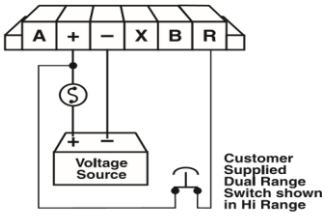
Flow Control



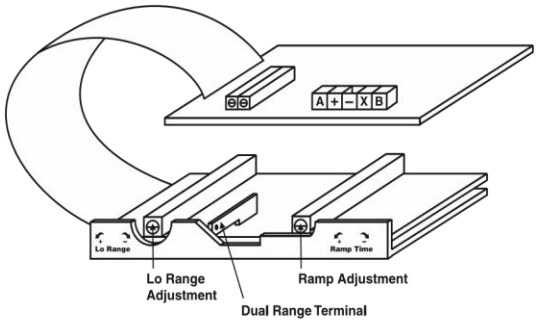
Typical Dual Coil
High Current with Return



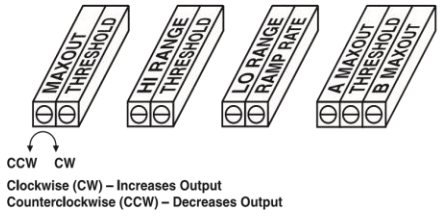
High Current
Flow Control



Dual
Range



IRS + Dual Range Option
When Used with Separate Module



Adjustment Trimpots are Multi-Turn, End-to-End Devices. It May Be Necessary to Turn the Trimpot Several Turns to Increase or Decrease the Output.

WARNING: It is the purchaser's responsibility to determine the suitability of any OEM Controls product for an intended application, and to ensure that it is installed and guarded in accordance with all federal, state, local and private safety and health regulations, codes and standards.

Due to the unlimited variety of machines, vehicles and equipment on which our controls are used, and the numerous standards which are frequently the subject of varying interpretation, it is impossible for OEM Controls personnel to provide expert advice regarding the suitability of a given controller for a specific application. The flexibility of our products allows us to offer thousands of custom configurations. We can advise you of the various features that are available and you can examine models to see what meets your needs. We believe our customers' engineering departments should be the qualified experts in their own product field. If the product will be used in a safety critical application, the customer must undertake appropriate testing and evaluation to prevent injury to the ultimate user.

Should you have any questions or if any of the above warning is unclear, please contact OEM Controls at 10 Controls Drive, Shelton, CT 06484, FAX: 203.929.3867, TEL: 203.929.8431.

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