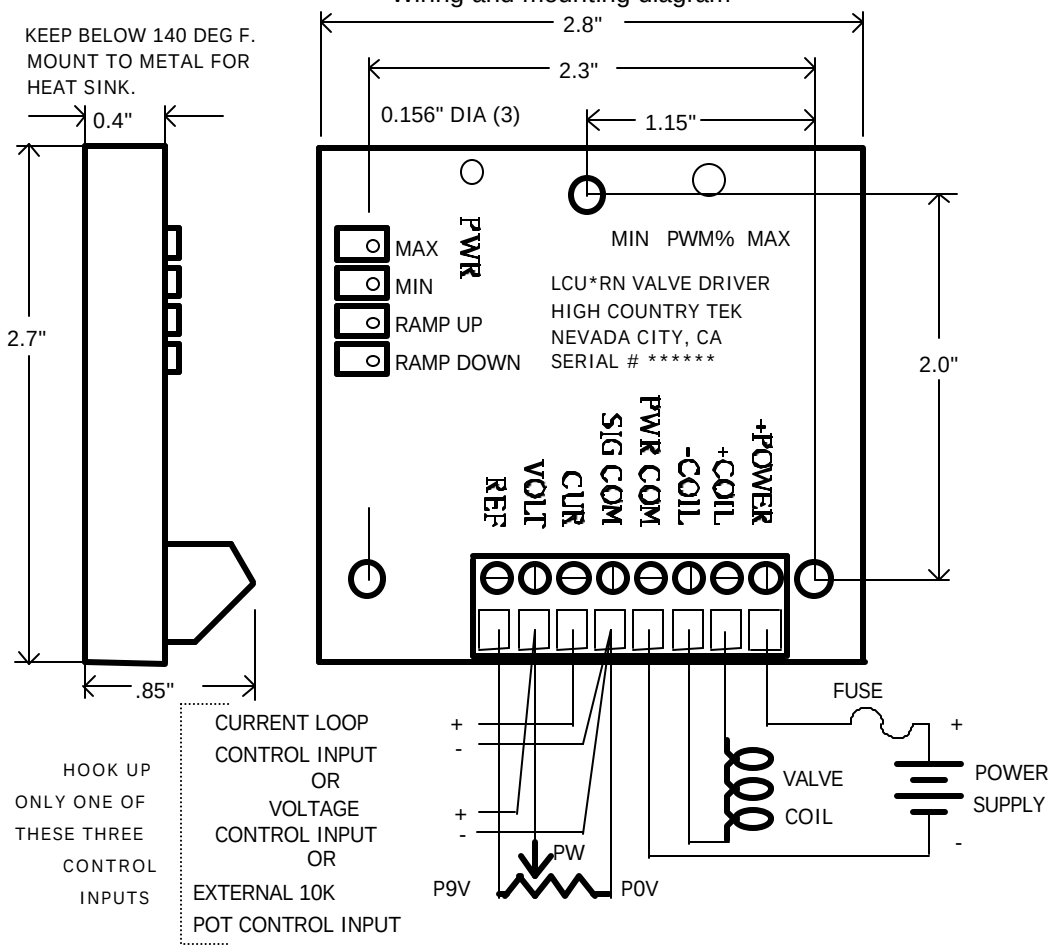
Wiring and mounting diagram



Control input choices:

1. Current loop control input, 0 to 20 mA or 4 to 20 mA
2. Voltage control input, 0 to +10 V or -5 to +5 V
3. External 10 Kohm pot control input. A pot and knob come with the card. PW is the middle (wiper) pin. When the wiper is rotated to the P9V pin, the VOLT terminal will be at 9 V, for greatest valve shift. When the wiper is rotated to the P0V pin, the VOLT terminal will be at 0 V, for least valve shift. Usually the wiper is rotated to the P9V pin when the pot is fully CW. Reverse the P9V and P0V pins if minimum valve shift causes maximum system response.

Wiring:

Hook up unit per above diagram, using only one of the three control input choices.

Use 16 AWG wire for power and coil wiring. Use shrouded coil connectors.

The fuse should be located as close to the power supply as possible. This will protect the wiring and the valve controller.

Use **only** an AGC-5 fuse for up to 3.33A coils, or an AGC-10 fuse for 3.34A to 5.00A coils. Failure to use a fuse invalidates the warranty.

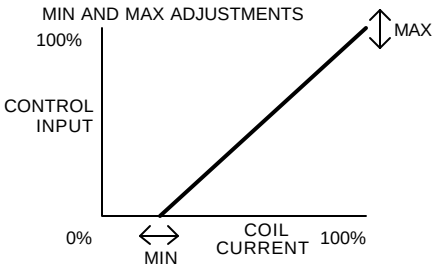
Set up procedure:

The unit is best adjusted by observing the system response. Coil current can also be used, but coil voltage is not accurate.

Always adjust the MIN or MAX pot until the response starts changing and then adjust to the desired response.

1. Turn the MAX pot 10 turns CW and the MIN, RAMP UP, RAMP DOWN pots 10 turns CCW.

2. Turn on the power supply. The PWR light will come on if the power supply voltage is greater than 10.5 volts. The unit will not function correctly if the PWR light is off or blinking.



3. The PWM% light indicates the duty cycle of the voltage to the coil by going from pure red, always off, through pure green, always on. The ratio of red to green gives a relative indication of current flow through the coil as an aid to tuning and trouble shooting. In many systems, the maximum duty cycle required to drive the coil will result in a yellow light.

4. Set the control input to minimum, (0 mA, 0 V or etc.) and adjust the MIN pot for the desired response,

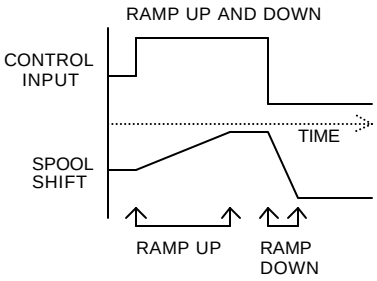
CW for more current. The MIN pot can eliminate the valve's deadband.

5. Adjust the MAX pot 10 turns CCW. Set the control input to its maximum, (20 mA or 10 V or etc.) and adjust the MAX pot for the desired maximum response, CW for more current. The MAX pot adjusts the maximum valve shift.

Do not adjust the unit for more current than is required to fully shift the

valve; this reduces the useful range of the control input and may harm the coil.

6. The MIN and MAX pots interact and the system response may change as it warms up. Warm up the system and repeat steps 3 and 4 until both MIN and MAX pots are adjusted properly.



7. There is a RAMP UP and a RAMP DOWN pot. Set the RAMP UP pot to the desired value by quickly switching the control input from minimum to maximum, while observing the speed of response. Set the RAMP DOWN pots the same way, but going from maximum to minimum. Turning the ramp pots CW will increase the ramp time. The ramps slow down the system's response to fast control input changes.

Trouble shooting

If the set up procedure does not achieve the desired results, double check the wiring and perform the following tests. Record the test results.

Tools required:

A battery operated multi meter and a small screw driver are required.

Check the power input:

The card will not function correctly unless the +POWER to PWR COM voltage is at least 11 V. If this voltage is more than 30 V the card may be damaged.

Check the control input you are using:

Pot input: Measure the wiper voltage between the VOLT and SIG COM terminals. With a 10 Kohm pot, the wiper will go from 0 (minimum current) to 9 V. The difference in voltage should be more than 5 V from minimum to maximum. The voltage must not be less than 0 V or more than 10 V.

Current loop input: Measure the current into the CUR terminal. The difference in current should be at least 10 mA from minimum to maximum. The current must not be negative or more 20 mA. If a current meter is not available, measure the voltage from the CUR terminal to the SIG COM terminal and divide by 150 for an approximate reading.

Voltage input: The difference in voltage between the VOLT and SIG COM terminals should be greater than 5 V from minimum to maximum. The voltage must not be less than -5 V or more than +10 V.

Only one control input at a time may be hooked up.

Verify the coil is not shorted:

If the +COIL to -COIL is shorted, the valve driver will shut down it's output until the short is removed. Disconnect the wires going to the +COIL and -COIL terminals and measure the resistance between the wires. Verify it is correct for the coil being driven.

Check the card at full on and full off:

Temporarily disconnect all wires from the VOLT and CUR inputs. To test the card at full on, turn the MAX and MIN pots 10 turns CW and temporarily connect the VOLT and REF terminals. Measure the voltage from +COIL to -COIL. There should be more than three volts if the card is operating correctly and the correct coil is used. To check the card at full off, disconnect the VOLT and REF terminals and turn the MAX pot 10 turns CW and the MIN pot 10 turns CCW. The +COIL to -COIL voltage should be zero.

If the valve won't fully shift:

If the card passes the "full on test" above, the problem is in the system. Measure the power supply voltage at the power supply or battery and the voltage across the coil's terminals. Compare these readings to the values taken at the card. If there is excessive voltage drop in any of those wires, they should be shortened or replaced by bigger wires. Bad frame ground connections can cause large voltage drops.

If the valve shift is erratic :

Electrical interference on the control lines can cause erratic behavior if it is strong enough. Try changing the routing of the control wires to see if the problem changes.

Power supply interference or brown outs can also cause erratic behavior. Test for this by running the card off it's own fully charged battery.

If interference is not the problem, one of our valve controllers with dither may be required.

Stiction can keep the valve from moving for small control input changes, and then move too far when the control input changes enough to unstick it.

Hysterisis can cause the valve shift to be much different for the same control input depending on whether the control had last changed up or down.

Dither is a rapid, small movement of the valve about the set point. It is intended to keep the valve moving to avoid stiction, and to move far enough to cancel out hysterisis, while being small and fast enough not to be noticed by the system.