

## Dual PWM Solenoid Valve Controller VC-2, VC-2B, VC-2C

The VC-2 PWM Valve controller allows you to independently control the power to two proportional solenoid valves, up to 5 amps each using a potentiometer or an analog voltage (0-5V, 0-10V) or current level (4-20 mA). Use of PWM and low on-resistance MOSFETs allows for high efficiency control with minimal power loss. Selectable PWM frequencies allow for optimal control for your particular valve.

### Absolute Maximum Ratings:

Parameter	Max	Units
Continuous Output Current per channel	5	A
Instantaneous Output Current	7	A
Continuous Input Voltage	30	V

**Warning – operating at or above the absolute maximum ratings may damage your controller or your equipment under control.**

### Operating Parameters:

Parameter	Min	Typical	Max	Units
Input Voltage	6	12	26	V
Continuous Output Current	--	--	5	A
Digital Logic Input Low Level	0	--	1.5	V
Digital Logic Input High Level	3.5	--	5	V
Digital Input Capacitance	--	0.1	--	uF
Analog Voltage Input	0.0	--	5.0*	V
Analog Current Input**	0	4-20	20	mA
Potentiometer Total Resistance	1	10	30	kΩ
PWM Frequency	0.2	--	24	kHz
Quiescent Current Drain	5	10	16	mA
Temperature	-30	25	+55	°C

\* Maximum input is 10V for the 0-10V version (VC-2B).

\*\* Applicable to the 4-20 mA control version (VC-2C).

### Pin-out:

Pin Label	Function	Active H/L
V+	Positive input from power supply	--
GND	Negative input from power supply	--
O1+	Positive output to valve, CH 1	--
O1-	Negative output to valve, CH 1	--
O2+	Positive output to valve, CH 2	--
O2-	Negative output to valve, CH 2	--
P+	Positive to potentiometers (+5V)	--
CN1	Wiper of pot or 0-5V input signal, CH 1	--
CN2	Wiper of pot or 0-5V input signal, CH 2	--
P-	Lower pin of potentiometers or analog ground	--
EN1	Enable, CH 1	H = enable, L = disable
EN2	Enable, CH 2	H = enable, L = disable

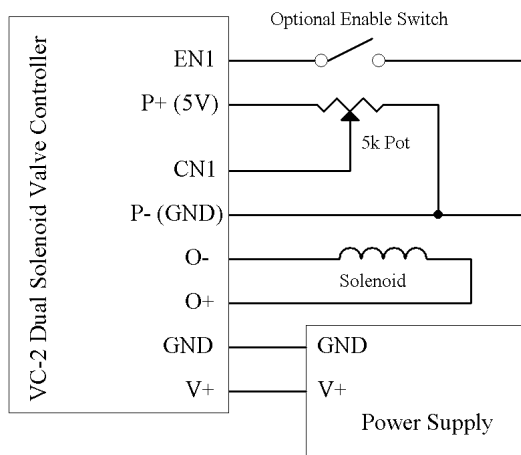


Fig 1: Potentiometer Connections for VC-2 (0-5V version). Channel 1 is shown.

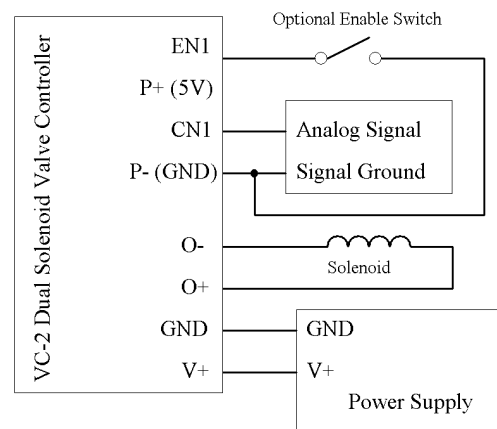


Fig 2: Analog Signal Input Connections  
0-5v Control for VC-2, 0-10V for VC-2B  
4-20 mA for VC-2C. Channel 1 is shown.

### Operation:

The on-board LED's will flash slowly during normal operation. The LED will flash quickly when an error is detected (VC-2C only).

#### VC-2: (Standard Version)

A potentiometer of 1k – 30k can be used to control the pulse width. Alternatively, a varying voltage (0 – 5 V) level applied between the CN1 (CN2) and P- pins can be used as well. The voltage input is converted to a pulse width at the output (0 – 100%).

There is a built-in dead-band that sets the duty cycle to:  
0% for any voltage level < 0.10 V.  
100% for any voltage level > 4.90 V.

#### VC-2B: (0-10 V Control)

A varying voltage between 0 and 10 volts applied to the CN1 (CN2) and P- pins will produce a varying pulse width from 0 – 100% at the output.

There is a built-in dead-band that sets the duty cycle to:  
0% for any voltage level < 0.20 V.  
100% for any voltage level > 9.80 V.

#### VC-2C: (4-20 mA Control)

A current between 4 and 20 mA applied to CN1 (CN2) and the P- pins will produce a varying pulse width from 0 – 100% at the output. Any current less than 4 mA will produce no output and indicates a disconnected or failed signal wire. The LED will flash quickly when the controller detects less than 4 mA.

### Output Enable:

The output is enabled by default and is internally pulled up. Bringing the EN pin low immediately brings the PWM output to 0%. Allowing the pin to return to high re-enables the PWM output at the previous duty cycle.

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**Frequency Selection:**

The PWM frequency can be switched to better match your solenoid valve's characteristics. The DIP switch settings are as follows:

Frequency	Switch 1	Switch 2	Switch 3
200 Hz	OFF	OFF	ON
400 Hz	OFF	ON	OFF
800 Hz	OFF	ON	ON
1.5 kHz	ON	OFF	OFF
3 kHz	ON	OFF	ON
6 kHz	ON	ON	OFF
12 kHz	ON	ON	ON
24 kHz	OFF	OFF	OFF

\* These settings take effect at power-up. Switch 4 is not used.

**Application Notes:**

A fuse appropriately rated for the load device is required to ensure safe operation.

This controller is not reverse-polarity protected. Ensure that it is wired correctly before applying power. Always turn off the power supply before making any changes to the wiring.

PWM controllers switch currents at high frequencies to vary the average power to the load. This switching can cause undesirable RF interference. To minimize such interference, it is recommended to twist the input V+ and Ground wire pair as well as the Out+ and Out- wire pair.

Ensure that the controller has adequate air flow for proper cooling. If operating for extended periods of time in high temperature environments, a cooling fan may be necessary.

Use the shortest possible wiring between the load and controller, and between the controller and the power source. Ensure that the cables carrying the load current are adequately sized. Inadequate power supply filtering or other causes leading to a high impedance path to the power supply will result in higher losses in the filter capacitor and wiring, and may damage the load and/or controller.

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**30-Day Limited Warranty:**

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