SPLIT SECOND

VC3-100
Voltage Clamp

Description:

The VC3-100 Voltage Clamp is designed to limit signals to a user-adjustable signal range. Its third-generation circuit design performs a precision clamp function when operated from either a 5V or 12V power supply. Under normal operating conditions, the VC3-100 outputs a signal that is identical to the signal present at its input. When the input voltage reaches the internally set clamp level, the VC3-100 maintains a constant output voltage as the input voltage exceeds the limit voltage.

The VC3-100 can limit a signal to both an upper and lower limit. The clamp levels are set by a pair of user adjustable, internal 20-turn trim potentiometers. The clamp levels are very stable over time and temperature. Once in clamp, the VC3-100 maintains the clamp level precisely regardless of overdrive.

The VC3-100 is especially useful for forced induction conversions where a supercharger or turbocharger is fitted to an engine that was originally naturally aspirated. Under boost, the engine can generate higher flow or pressure levels than normal. The clamping function of the VC3-100 maintains the input to the ECU within normal levels. Throughout its entire tracking and clamping range, the VC3-100 always produces a clean, undistorted signal that the ECU can reliably read.

The VC3-100 allows the conversion to forced induction on engines with modern fuel injection including those with OBDII on-board diagnostics. The stock ECU programming may be used without activation of fault codes under boost.

Features:

- Hard clamps limit to a precise level
- Can be used with either a 5V or 12V supply voltage
- User adjustable high clamp level from 2.5V to 5V with a 5V supply
- User adjustable high clamp level from 3.5V to 7V with a 12V supply
- User adjustable low clamp sets lower voltage limit
- Avoids fault codes due to excess flow or pressure readings
- Prevents fuel cut
- Compatible with OBDII systems
- Clean, undistorted output signal

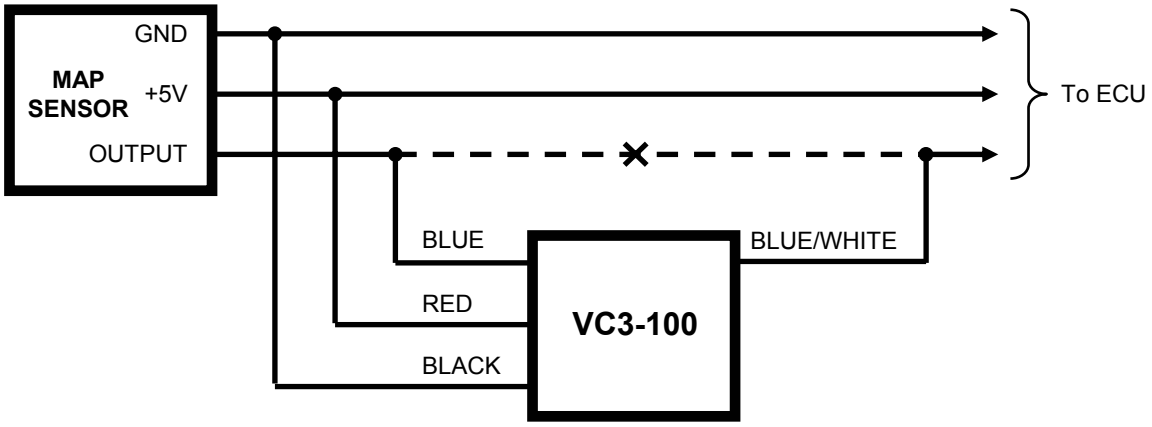
Wire Assignments:

WIRE COLOR	CONNECT TO	LABEL
Red	Sensor power	POWER
Black	Sensor ground	GROUND
Blue	Sensor output	SIGNAL IN
Blue/White	Sensor input to the ECU	SIGNAL OUT

Typical Connections:

This diagram shows the typical connections for use with a 5V map sensor. The same +5V and ground that power the map sensor are used to power the VC3-100. These connections will avoid errors due to different ground voltages at different locations on the vehicle. This will also insure that the output signal is active whenever the map sensor is active. Note that map sensors can be powered up even when the vehicle ignition is off.

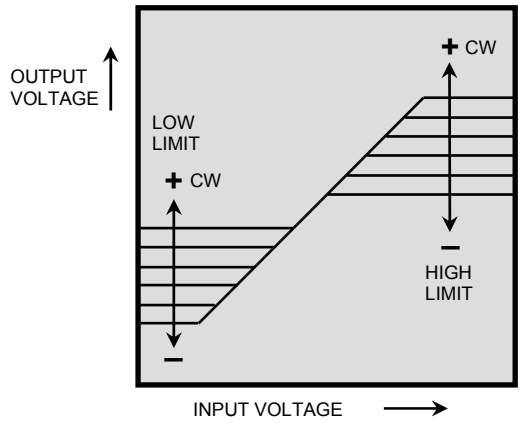
The signal wire from the sensor to the ECU is cut. The blue wire is connected to the sensor side of the cut wire. The blue/white wire is connected to the ECU side of the cut wire. When use with a 5V supply, the high clamp voltage range is from 2.5V to 5V. The low clamp voltage range is from zero to 2.5V.

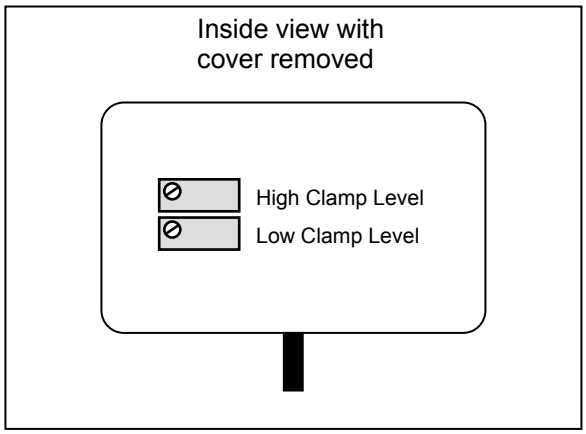


The connections are the same when used with an MAF sensor. Most MAF sensors operate from a 12V supply voltage. The red wire on the VC3-100 is connected to the 12V wire on the MAF sensor. Connect the black wire to the MAF sensor ground wire. When used with a 12V supply, the high clamp voltage range is from 3.5V to 7V. The low clamp voltage range is from zero to 3.5V

Clamp Function (User adjustable):

The diagram below illustrates the effect of adjustment to the clamp levels. Below the high clamp level, the output tracks the input. Above the clamp level, the output is held constant at the clamp level. The low clamp works the same way, but sets an adjustable lower limit.





Clamp Adjustment

In order to adjust the clamp voltage, remove the two screws holding on the bottom cover. Under that cover you will find a pair of 20-turn trim potentiometers. Use a miniature screwdriver to adjust the setting. Turning the setting clockwise will increase the clamp voltage.

To adjust the high clamp to a specific voltage, temporarily connect the blue wire to the red wire. Connect a DVM set to DC volts to the blue/white wire. Turn the high level until you read the desired voltage on the DVM. To adjust the low clamp level, temporarily ground the input and turn the low setting until you read the desire voltage.

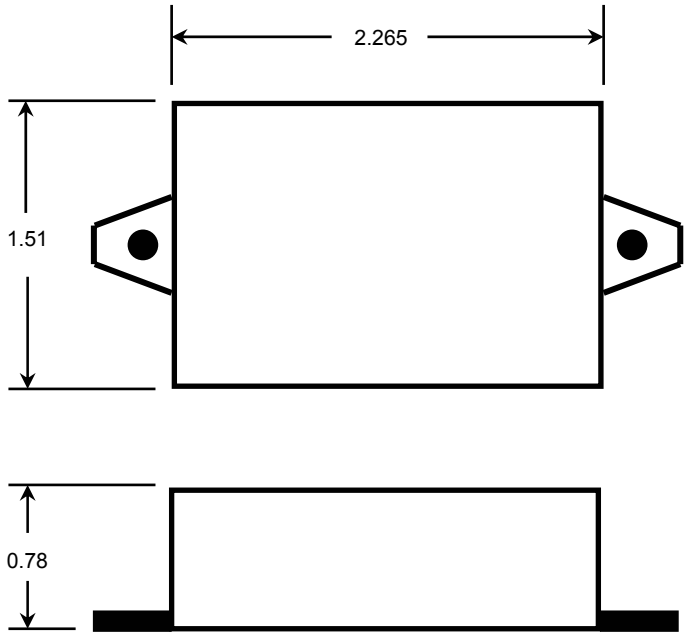
When used to clamp map sensors on OBDII applications, the clamp settings can be done with a scan tool that can read engine data. This method is very accurate at sea level, but is not recommended if the adjustment is made at high elevations.

With ignition-on and engine-off, bring up the map sensor reading on the scan tool. The reading may be in inHg, kPa or some other units of measurement. If your tool reads in kPa for example, the reading should be 101 kPa at sea level. If the reading is lower than that, turn the setting clockwise. Find the setting where the reading stops increasing as the setting is increased. Turn the setting another ¼ turn clockwise for a little headroom.

Electrical Characteristics:

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Supply Voltage (Vs)	Vs to ground	4.5		14	V
Input Voltage	Signal Input to ground			Vs	V
High Clamp Range	5V supply	2.5		5	V
High Clamp Range	12V supply	3.5		7	V
Low Clamp Range	5V supply	0		2.5	V
Low Clamp Range	12V supply	0		3.5	V
Input Resistance	Signal Input to ground		100		kΩ
Output Resistance			50		Ω
Supply Current			5		mA

Mechanical Characteristics:



(dimensions in

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