

# ROBOT POWER

## Robot Power Products

### Vyper Product Information



The Robot Power Vyper is a flexible high-performance one-channel motor controller for medium to large mobile robots such as firefighting robots, sumo, robotic combat, theater props, inspection and other applications. It may be used on robots up to as much as 500 pounds or more as long as the motor current limits are respected.

Also the Vyper supports manually controlled "throttle" applications such as scooters, boats, winches and others using a pot or other analog voltage control. Similarly the Vyper is suitable for applications including lights, hydraulic valves, pumps and other non-robot uses.

## Features

The Vyper contains the following features:

- **120A continuous current** (>250A peak!)
- 7.0V to 36V battery voltage
- Overtemp protection
- Size: 3.125" x 2.875" x 1.375"
- Weight: 6.5 oz (185g) without wires
- Input pin headers for:
  - RC input or Pot/Voltage Control - fully reversible H-bridge channel
  - Limit Switch inputs
- Indicator LED for speed and direction. A status/error LED shows the control signal status and error conditions
- Failsafe shuts off motor if control signal is lost
- Calibration function to match Vyper to your radio or analog pot source - settings stored in EEPROM
- Switching style 5V regulator (BEC function) eliminates battery voltage worries and provides increased current on the 5V rail for the newer 2.4GHz radio receivers - BEC can be disabled
- RC Mode Options:
  - BEC On/Off
  - Brake or Coast at zero speed
  - Lipo battery cut-off On/Off
- Pot Mode Options:
  - Forward only or Forward/Reverse control
  - SafeStart On/Off (control must be set to zero speed to start)



*Vyper Controls*

## Control Features

The Vyper is designed to provide easy control of your motor via the two most common forms of input; namely RC servo signal or an analog voltage via a pot. The control modes and options are set via a small DIP switch accessible from the top of the Vyper. The following table describes the control options available on the Vyper.

### RC Mode

SW	ON	OFF

1	BEC On	BEC Off
2	RC Mode	-
3	Brake Mode	Coast Mode
4	Lipo Cutoff	Lipo Ignore

#### Pot Mode

SW	ON	OFF
1	5V On to pot	5V Off
2	-	Pot Mode
3	Forward & Reverse mode	Forward only mode
4	Safe Start mode	Safe Start off

The following configuration options are available in the Scorpion XXL software:

- **RC Mode / Pot Mode** - Switch #2 controls the Vyper operating mode. When ON RC Mode is selected. When OFF Pot Mode is selected. Mode configuration switches are read upon power-up and switching them while in operation does not change the operating mode.
- **BEC** - The BEC function supplies 5V to the RC receiver in **RC mode**. Switch #1 controls the BEC mode. Turning Switch #1 ON supplies 5V to the RC receiver through the RC cable. If the RC receiver has a battery or other voltage supply then this can be turned OFF. Also, turning BEC off allows multiple Vypers to be connected to the RC receiver without the 5V regulators on each unit conflicting. Finally if servos or other loads are to be driven by the receiver, the BEC should be turned off and a voltage source with sufficient capacity should be used. The BEC function is only intended to power a receiver or other low-current load. It does not have enough capacity to drive a servo or other high-current load.
- **Brake/Coast** - in **RC Mode** switching the #3 switch to ON activates Brake Mode. In this mode the motor leads are shorted together when a zero speed is commanded. This provides a strong electromagnetic braking action to the motor. The OFF position activates Coast Mode. In this mode the motor leads are disconnected at zero speed. This allows the motor to more gently coast to a stop. The physics of the individual application will decide which setting is best.
- **Forward or Forward/Reverse** - In **Pot mode** Setting the #3 switch to ON activates Forward and Reverse mode - OFF activates Forward Only Mode. In Forward/Reverse mode the pot control will be off in the center position with power to the motor increasing in either the forward or reverse direction as the pot is moved away from the center position. In Forward Only mode the power to the load will be off at one extreme of the pot travel and power will increase in only one direction as the pot is moved to the other extreme. This is similar to a scooter or car throttle action and is used where reversing voltage to the load is not needed.
- **Lipo Cutoff** - in **RC Mode** the #4 switch controls the Lipo battery safety cut-off feature. When switched ON the Lipo cut-off is activated if OFF the battery voltage is ignored. Lithium chemistry batteries can be damaged if they are over-discharged. The Lipo cut-off feature will disable the outputs if the battery voltage falls below 3.0V per battery cell. The system determines the cell count at power-on and calculates the cutoff voltage from that. If the battery is mostly discharged when the unit is powered on an incorrect cell count may result and the cut-off function may not work properly allowing excessive discharge of the battery.
- **Safe Start Mode** - in **Pot mode** switch #4 sets Safe Start mode when ON and turns it off when OFF. Safe Start prevents the motor from getting any power until the control is moved to the zero speed position. In Forward/Reverse mode this is the center off point and in Forward mode it is one extreme of travel. After the control is moved to the zero position the motor will activate and follow the control in the selected mode. This prevents the motor from jumping into motion when power is applied.

- **Calibrate** - a pushbutton switch is provided to activate the Vyper's calibrate mode. This mode is used to map the RC signal source or Pot voltage to the full range of motor outputs. The range of values sent by the signal source is recorded and the Vyper stores the values in non-volatile memory and retains them permanently.

Documentation for the Vyper with details on setup and operation of the controller will be available soon from the [downloads page](#). Contact us for any detailed questions about setup or use of the Vyper.

Robot Power offers the Vyper in fully assembled and ready to install and use. Check the [Web store](#) for details on prices and special offers.