



# ***Brushless Micropump Variable Controller***

## **TCS Brushless Controller: EQ20-VAR**

**(for use with all variants of the MG1000 & M500 including S, Waterproof and Submersible variants)**

(Patents Pending, Quality Assured ISO 9001, RoHS compliant)

## **INTRODUCTION**

The TCS EQ20-VAR control board is a small lightweight device that can be installed in-line with the Micropump's own wiring.

The input voltage can be anywhere between 6-24v dc (long red/black wires). There is an inbuilt voltage regulator that will limit the output voltage between 6-16v dc (this can be used to control the pump output).

Using the EQ20 you can control the output by either the on board speed control pot or from an external 0-5v input (short red/black wires). This is switchable by the user via the onboard control switch in the top corner of the device.

Instant on/off control of the Micropump can be achieved by fitting a switch to the yellow/blue pair of wires (this is default set to on with no switch connected).

There are 2 onboard LED's. Red LED is to let you know the unit is powered. Green LED is to let you know that the pump is running (this LED will only go out when the optional switch is fitted).

It is highly efficient, small and lightweight and can be quickly and easily installed into the smallest spaces, in a vast range of laboratory, prototype and production equipment.

## **ELECTRICAL CONNECTION**

<b>Voltage:</b>	<b>6 - 24V DC</b>
<b>Input:</b>	<b>Red lead +VE: Black lead -VE (225mm long)</b>
<b>Switch:</b>	<b>Optional. Yellow/Blue leads (50mm long)</b>
<b>0-5v Input:</b>	<b>Optional. Red/Black leads (50mm long)</b>
<b>Output:</b>	<b>3 wire DC Sensorless Brushless Motor (colour coded to match the Micropump wires)</b>

Connect the output 3 wires of the EQ20 to the corresponding colour coded Yellow/Green/Red 3 wires on the Micropump. Next connect the Red/Black input wires to your power source. We suggest that you start with a voltage of 12v. When the power is first applied there is a 4 second delay before the pump runs while the electronics carry out a diagnostics check and then the EQ20 will start the pump. You can now control the output by adjusting the pot's to reduce/control the flow rate. If instant on/off control of the Micropump is required you can fit a switch to the yellow/blue wires. The switch will only turn the Micropump on/off regardless of the settings you have made with the control pot's.

Further fine tuning can be made by restricting the outlet of your pump using a fixed jet restriction or flexible tubing and an adjustable clamp.

**(The EQ20 is not waterproof and if used with a submersible or waterproof pump it must be installed so that it is protected from the liquid. DO NOT immerse the EQ20)**