TCS MICROPUMPS: EQi M3

Suitable for use with all versions of the M3000 Micropump.
(Patents Pending, Quality Assured ISO 9001, RoHS compliant)

INTRODUCTION

The TCS EQi M3 control board is a highly efficient, small and lightweight device and can be quickly and easily installed into the smallest spaces, in a vast range of laboratory, prototype and production equipment.

The EQi M3 will accept an input voltage of up to 30v DC. The output from the EQi M3 can be controlled by either the on board speed control pot or from an external 0-3.3v input. The flow direction can be reversed. The board can be switched on and off by an Enable function. Pump RPM can be measured by a pulse output pin.

The speed of the pump is 'Governed' above 12v to maintain a constant flow as the back pressure increases. This provides a flatter pressure/flow curve. Below 12v the pump speed will decrease as the voltage is lowered.

ELECTRICAL CONNECTION

Voltage: up to 30 DC
Input: 4 screw terminal : UP to 30v/GND
Output: 6 screw terminal : Phase XYZ

1. Connect the 3 wires of the Micropump to the 3 screw terminals marked 'Phase XYZ'.
2. Connect the Input power to the 2 screw terminals marked 'Up to 30V (+) & GND (-)'.
3. Set Jumper plug for either onboard speed control in accordance with the wiring diagram or remove it entirely if using 0-3.3V control. NOTE: if using the external 0-3.3v control or if using the enable or direction features please use the supplied leads to connect to the relevant pins as labelled in the wiring diagram.
4. If using the EQi M3 in 0-3.3V control remove the jumper pin from the 6 pin header. Connect the '0-3.3V Input pin' to the positive of your external adjustable power supply, connect the 'GND' pin to ground of the same power supply. 0V the pump will be switched off, as voltage is increased the pump speed will increase, at 3.3V the pump will be at full speed. NOTE: Do not exceed 3.3V on the '0-3.3V Input pin' this will cause irreversible damage to the EQi M3.
5. If you require to reverse the flow of the pump, connect the 'Direction pin' to 'GND', this will reverse the flow. When the pin is disconnected it will revert to the original flow direction.
6. If you require to use the enable function (ON/OFF Switch) connect the 'Enable Input pin' to 'GND' this will turn the pump off. When the pin is disconnected the pump will be on.
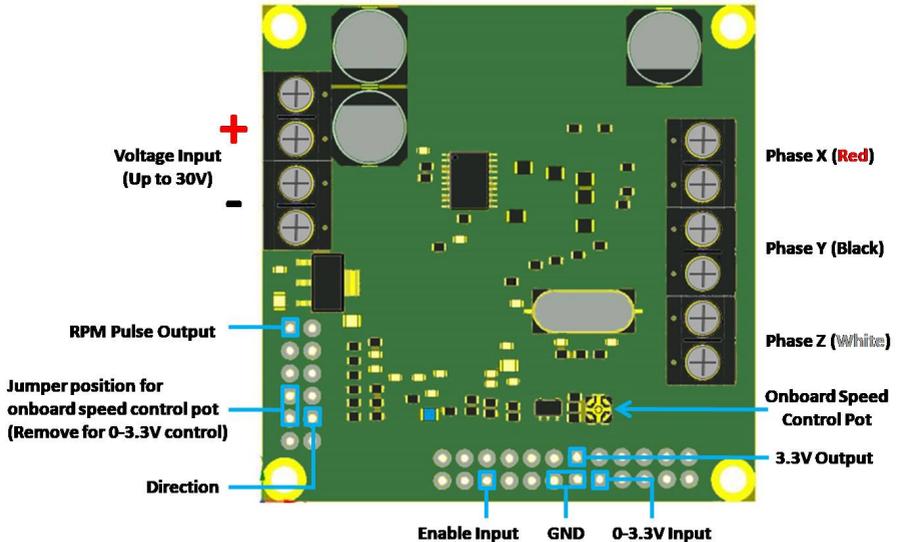
TCS suggest that you begin testing with a supply voltage of 12v.

Designed & Manufactured in the United Kingdom by TCS Micropumps Limited.
info@micropumps.co.uk.   T 01795 539 655   www.micropumps.co.uk

Document Ref No
IM159 REV 3
28.05.20

EQi - M3
Intelligent
Brushless Controller

It is advised to use an 'always live' supply voltage as the EQi M3 is instant start. If a slow starting power supply is used it may cause the EQi M3 not to start. If this is the case then turn on PSU first and then connect the EQi.

Wiring Diagram

Always make all connections before powering the EQi M3.

Voltage Input (Up to 30V)
RPM Pulse Output
Jumper position for onboard speed control pot (Remove for 0-3.3V control)
Direction
Enable Input   **GND**   **0-3.3V Input**
Phase X (Red)
Phase Y (Black)
Phase Z (White)
Onboard Speed Control Pot
3.3V Output

RPM Pulse Output (Reading pump RPM)

The pin marked as 'RPM Pulse Output' provides a frequency output (Hz) this can be measured with an oscilloscope. Some multimeters also have the ability to ready frequency.
Connect the 'RPM Pulse Output pin' to an oscilloscope probe and the ground from the probe to the ground on the three pin header, this will display as a square waveform in which frequency can be read.
For the correct RPM the read frequency must be multiplied by 10.
Example 1000Hz x 10 = 10000 RPM.
The MG3000 series will be at approximately 6000 RPM at full speed

CAUTION

On the base of the EQi M3 is an aluminium mount. This may get hot in operation and TCS recommend that is is mounted to a heat conductive surface.
Do not apply reverse polarity to the EQi M3.
Do not exceed 3.3V on the 0-3.3V Input Pin