

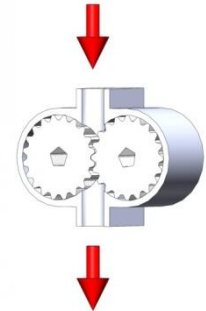


## TCS 'MG' micro-gear pump range.

TCS Micropumps manufacture a range of miniature gear pumps for liquids, that will satisfy pumping requirements where, small size, high pressure, the ability to self prime and reversibility maybe key requirements.

## Working Principle

A gear pump uses the meshing of gears to pump fluid, by displacing the fluid trapped between the teeth. Fluid is transported from the inlet, around the outside of each gear in the pockets between the teeth to the outlet. Gear pumps are positive displacement pumps with a set volume of liquid being pumped for each turn of the drive motor.



## Capabilities and Key Features

High pressure capability

Smooth, almost pulseless flow

Reversible

Self-priming

When used in combination with TCS's EQi controller they are able to deliver high and consistent flow rates against high, low or changing back pressure.

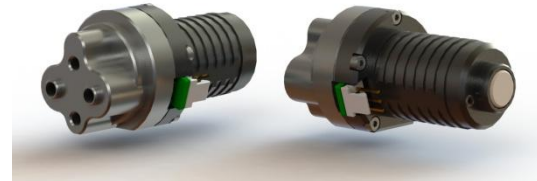
## MGD1000 RANGE

A range of lightweight self-priming pumps suitable for liquids that provide high pressure capabilities.

Various models are available capable of flows up to 1LPM and pressures of up to 10Bar.

Delivering a smooth, consistent, almost pulseless flow throughout the pressure range, these pumps are particularly suitable for systems where pressure and consistency are key requirements.

The MGD1000 Micropumps, driven by TCS's sensorless brushless motor technology (#E20) can utilise the EQi electronic driver circuit for maximum flexibility. The EQi is designed to be used independently or can be plugged onto the customers own PCB via a standard header pin configuration.

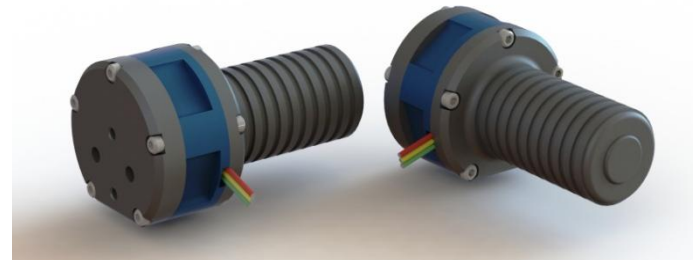
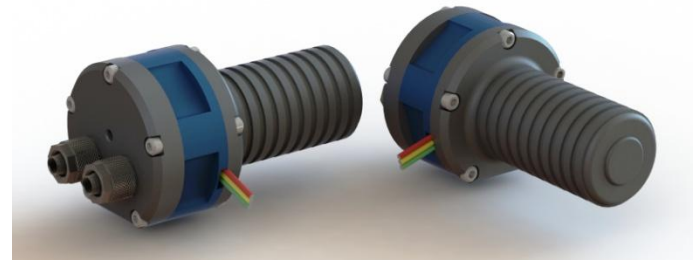


## MG2000 RANGE

Offering all the benefits of the MGD1000 pump range but in a larger form factor with higher performance capability. Various models are available capable of flows up to 2.4LPM and pressures of up to 16Bar

Delivering a smooth consistent, almost pulse less flow, through out the pressure range, these pumps are particularly suitable for systems where higher flows, pressures and consistency are key requirements.

The MG2000 Micropumps are driven by TCS's sensorless brushless motor technology (#E32) and can also utilise the EQi electronic driver circuit for maximum flexibility. The EQi is designed to be used independently or can be plugged onto the customers own PCB via a standard header pins.



## MGD3000 RANGE

These are the highest performing pumps in the TCS gear pump range and are capable of exceptional flow rates even at elevated pressure points.

Like the smaller models the MGD3000 pump range are driven by TCS's sensorless brushless motor technology (#E36) but because of the greatly increased performance potential they require a high power electronic driver circuit if you are to take advantage of this performance increase.

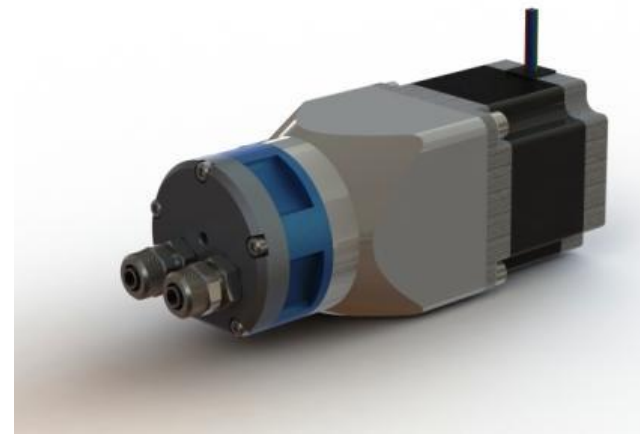
The Eqi-MG3 controller has been designed to allow full access to the increased pump potential and can be used independently or plugged onto the customer's own PCB via a standard header pin configuration.



## Stepper Motor Pumps

The MG2000-STEP is a high quality miniature dosing pump for liquids. It is seal less by design and connects the unique and proven TCS Micropumps long life gear pump head unit to a stepper motor via a sealed magnetic drive system.

When combined with a suitable controller the MG2000-STEP is not only capable of accurate flow rates but can be programmed to dispense highly accurate doses

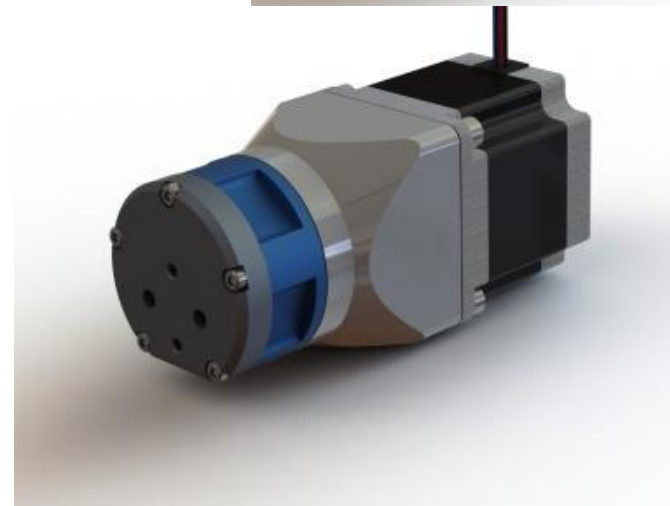
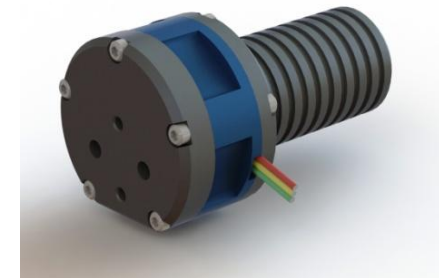


## Manifold Pumps

A potential weak point for any pump, are the problems that are associated with connecting it to the equipment it is working with. The flexibility that is offered by making all these connections with hoses, is the best solution for most customers however many find it advantageous to bolt the pump directly to their equipment.

TCS Micropumps offer a manifold version of most of their pumps however the high pressure capability of the MG gear pump range make them especially useful in these applications were the pumps exceptional pressure capabilities will burst hoses that have been incorrectly specified.

Mounting directly removes this weak point and can not only add to the overall system reliability but can also make servicing easy.



## Port Options

All MG series pumps are supplied with either G1/4" (1/4" BSP) threaded ports that are capable of accepting a wide range of standard connectors (push fit connectors are supplied as standard), or as a manifold mountable pump for direct fitment into a customers equipment.



## Special Variants

All standard 'MG series' pumps come in a range of different port configuration options, as shown. They can also be supplied with various seal materials to cover a wide range of different chemical requirements.

If a unique set of requirements is specified, that cannot be satisfied by a TCS stock pump, then the in-house R&D team, "TSO" can develop a bespoke OEM system, specifically tailored to suit the precise requirement.



# GEAR PUMPS - PERFORMANCE



TCS Micropumps test the performance and life expectancy of all pumps in house. Unless otherwise specified all tests are run using TCS Coolant (90% water + biocide + detergent), with the pump subjected to standard atmospheric pressure at 20-24deg C.

Note : The life of all pumps can be increased by running at a reduced performance / power point.

Failure mode in these tests, is defined as the point at which the pump is unable to deliver the set flow/pressure point regardless of the power supplied.

## Maximum Performance Characteristics

| Model    | Voltage Range | Max Flow  | Max Pressure | Max Power | Weight   |
|----------|---------------|-----------|--------------|-----------|----------|
| MGD1000S | 12-30V        | 500 mLpm  | 8 Bar        | 30W       | 142 grms |
| MGD1000F | 12-30V        | 850 mLpm  | 4 Bar        | 30W       | 142 grms |
| MGD1000P | 12-30V        | 400 mLpm  | 10 Bar       | 30W       | 142 grms |
| MGD2000S | 12-30V        | 1750 mLpm | 8 Bar        | 99W       | 340 grms |
| MGD2000F | 12-30V        | 2400 mLpm | 6 Bar        | 99W       | 340 grms |
| MGD2000P | 12-30V        | 800 mLpm  | 10 Bar       | 99W       | 340 grms |
| MGD3000S | 12-30V        | 2500mLpm  | 8 Bar        | 300W      | 400 grms |
| MGD3000F | 12-30V        | 3500mLpm  | 6 Bar        | 300W      | 400 grms |
| MGD3000P | 12-30V        | 1600mLpm  | 10 Bar       | 300W      | 400 grms |

## Life expectancy under typical example operating conditions

| Model   | Voltage | Flow      | Pressure | Power | Life        | Failure Mode   |
|---------|---------|-----------|----------|-------|-------------|--|
| MG1000S | 12 V    | 400 mLpm  | 3 Bar    | 21W   | 15,000 hrs  | Excessive wear on gear pockets or motor failure          |
| MG1000S | 12 V    | 400 mLpm  | 6 Bar    | 25W   | 2000 hrs    | Excessive wear on gear pockets (Fluid: unfiltered water) |
| MG2000S | 12 V    | 1200 mLpm | 1 Bar    | 22W   | 20,000+ hrs | Excessive wear on gear pockets or motor failure          |
| MG2000S | 12V     | 1000 mLpm | 4 Bar    | 46W   | 3 000 hrs   | Excessive wear on gear pockets                           |