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JONSN
PUMPS & TECHNOLOGY

# MPG SERIES PRECISION MAGNETIC GEAR PUMP OPERATING MANUAL



Please safekeep this manual.
Be sure to read the instructions of this product first, and then
follow the instructions to install and use this product.
This manual is applied to: MR Series Precision Magnetic Gear Pumps
Version No.: 2021

## Warning and Note



Warning: indicates that could cause personal injury or damage to equipment and other accidents etc.



Caution: must be observed to avoid damage to the device.



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### 1. Statement

Anyone to use, install, maintain, repair MR series gear pump, must read this manual entirely.



Upon receipt of equipment and before putting into use, check if the packaging is intact or not, the gear pump damage or not, while checking the list, any missing parts, can cause use problems or security issues. The manufacturer assumes no responsibility for equipment damage and personal injury caused.

Users are responsible for complying with the safety requirements mentioned in this manual, while the user must follow the relevant laws and regulations on safety requirements. Manufacturer is not responsible for violation of these requirements caused equipment damage and personal injury liability.

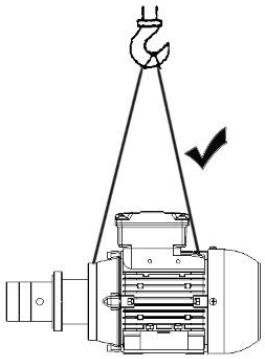
This device is designed for conditions of use when ordering, if conditions change, you must get the approval from the manufacturer or the agent authorized by the manufacturer, it can be put into use.

This equipment is only suitable for the use conditions and scope of this manual, any use of equipment beyond the scope resulting equipment damage or personal injury, the manufacturer doesn’t have to bear the responsibility.

## 2. Attention

2.1 TRANSPORT

When carrying the pump and motor, hands should hold the motor body whole carrying, not one hand holding pump head, one hand holding motor, it is easy to pull the pump head plate deformation, cause pump leakage.



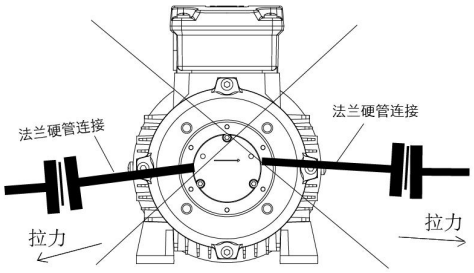


2.2 INSTALLATION

2.2.1 Pump installation - the pump is installed as close as possible to the liquid source, inlet and outlet pipeline size can't be smaller than the pump connection size, and try to shorten the length. If the inlet line must be very long, please increase the diameter. Minimize the pump inlet valve, the number of bends.

2.2.2 Piping Installation - Use a thread sealant or a Teflon sealant as a seal for the pipe connection. Don't damage the pump head during installation, don't affect the pump centering. When tightening the thread with a wrench, hold the pump head with your hand. Due to the small size of the pump, the inlet and outlet pipeline priority to use hose connection to reduce the pipeline power attached to the pump body, the pipe stress or tension too large is easy to pull the pump plate deformation, easily lead to pump leakage. When the pipe is connected with a flanged pipe, the pipe must be fitted with a support bracket fixed, center alignment, to ensure that when tightening the matching flange, will not pull the pump side of the pipeline, as far as possible to eliminate the pipeline deformation by stress, below is the installation instruction:






2.3 Filter - at the inlet of the pump should be installed 25μm or higher precision filter.

3.RUN

3.1 Magnetic drive ring - magnetic drive lets pump achieve zero leakage requirements, it also can provide protection for overvoltage to system and particle entering. When the internal and external magnetic loop occur dislocation under the extreme force, the decoupling phenomenon occurs.



3.2 When the pump locking rotor, the motor may continue to run, but the pump will stop running.

3.3 To resume running, please stop the motor completely before restarting.

3.4 If continue stalling, check whether the system overpressure. If the system pressure is normal, the pump must be disassembled to check if outer particles enter the body, resulting in gear stall. Clean internal parts, reassemble the pump. Before restarting, turn the motor fan blades, the pump and motor should be rotate smooth unimpeded.

3.5 Operating pressure - excessive inlet and outlet pressure difference causes the magnetic coupling slip. System pressure will have fluctuations and vibration noise.

3.6 Deliver viscous materials - too high viscosity and high speed will turn off the magnetic coupling, please run as per the selection speed.

3.7 Deliver high temperature materials - before leaving factory the pump gear and sliding bearing have safe expansion gap, so heat the pump to required temperature when delivering, otherwise, the pump will appear excessive leakage and pressure fluctuations at normal temperature.

3.8 Self-suction - pump has self-suction, but confirm the gear wetted by liquid before starting.

3.9 Dry-running – Dry-running will cause permanent damage to the pump, make sure that the pump has liquid when running.

4.0 Reverse - pump should rotate clockwise, short reversal is acceptable, but long continuous reversal will shorten the life of the pump.

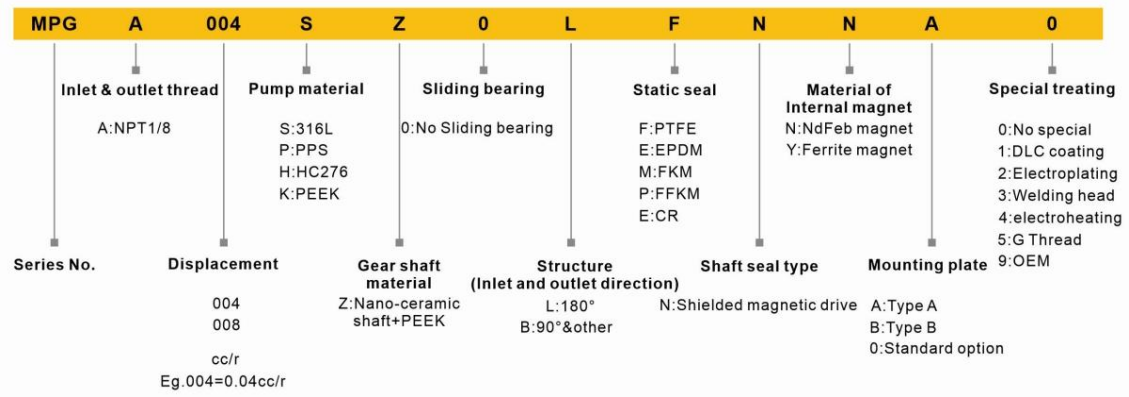
4.1 Engineering plastic gear pump - is prohibited for solvent containing dichloromethane, tetrahydrofuran, butyl lithium & dimethylacetamide and material delivering or cleaning, delivering above materials will make plastic gears and bearing sleeve swells stuck.

## 3.Technical Parameters

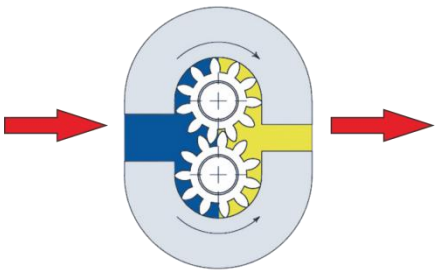
| | |
|---|---|
| Flow range | 1-320ml/min |
| Inlet pressure | -0.95~20bar |
| Differential pressure | 0~25bar Depends on material viscosity |
| Pressure resistance | for PTFE O-ring is 3 Mpa, for Viton O-ring is 4 Mpa |
| Temperature | Standard -20°C to 80°C, low temperature to -40°C, high temperature to 160°C can be customized |
| Viscosity range | 0.4-3000cps |
| Maximum density | 1.8 |
| Motor can be equipped | AC motor, BLDC motor, servo motor, variable frequency ex-proof motor |
| Import and export thread | NPT1/8、G1/8 |
| Non-standard customization | OEM mechanical equipment matching servo system customization |

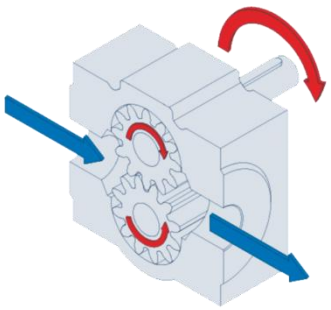


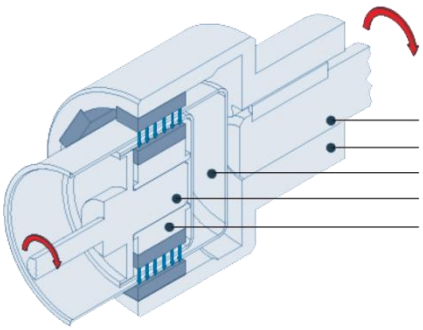
## 4.Configuration Code




## 5. Working Principle





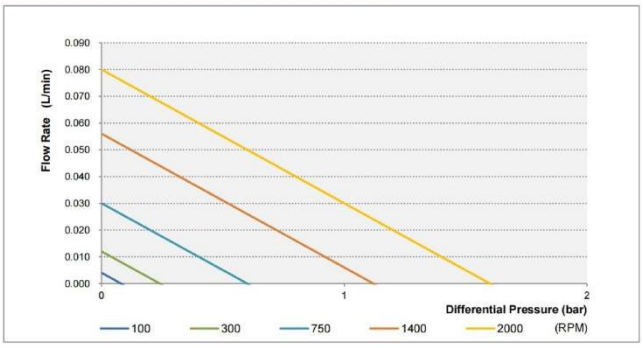


Motor shaft
External magnetic drive
Isolation cover
Driving gear shaft
Internal magnetic drive

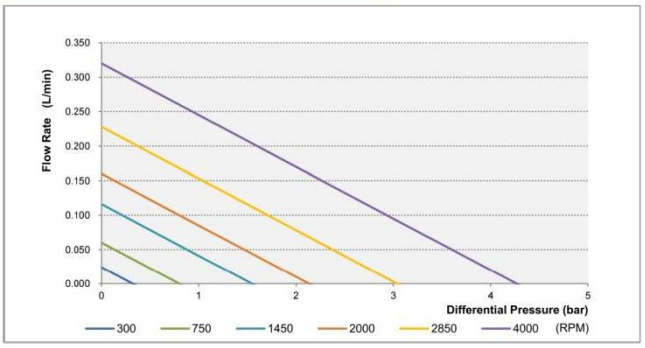
Media delivery direction
Motor rotation direction
magnetic field

## 6.Performance Curve

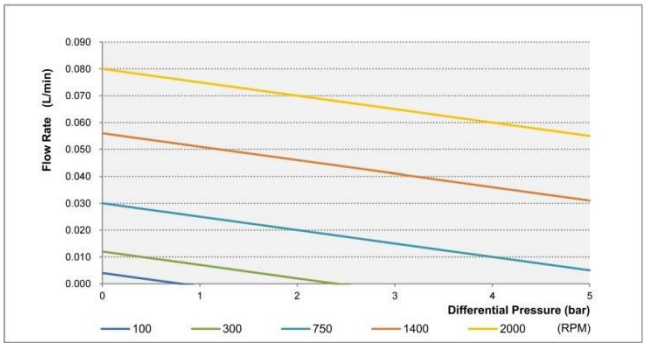
**Pump Head MPG04**
**Measured with water 1 mPas**



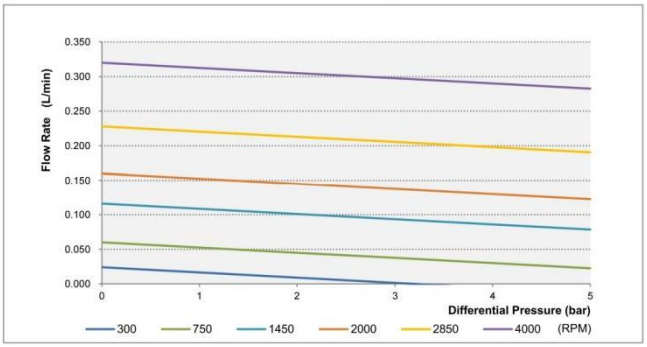

**Pump Head MPG08**
**Measured with water 1 mPas**




**Pump Head MPG04**
**Measured with oil 100 mPas**

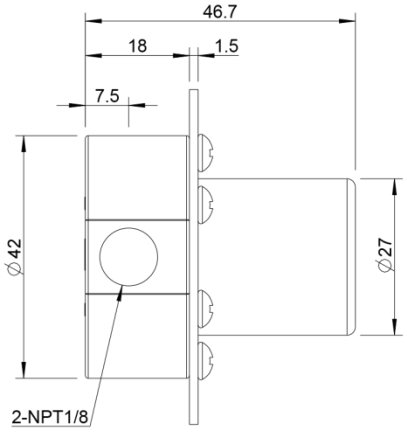


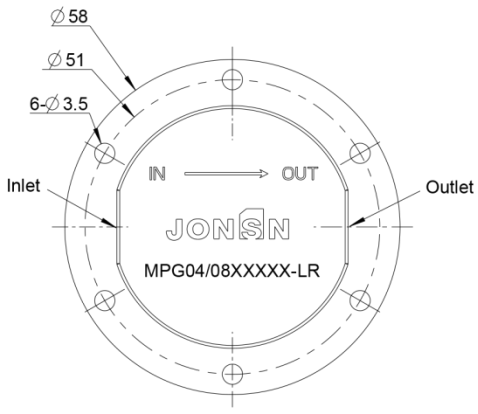

**Pump Head MPG08**
**Measured with oil 100 mPas**




## 7. Dimensional Drawing

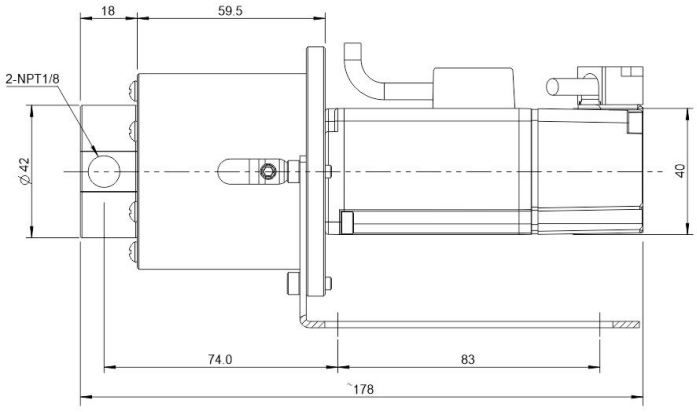
### MPG Gear Pumps

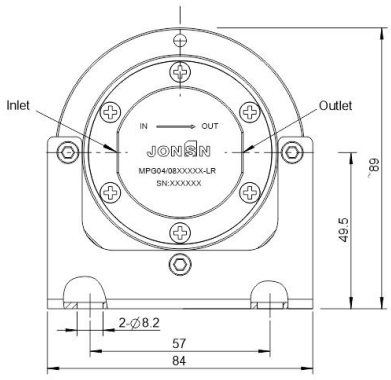


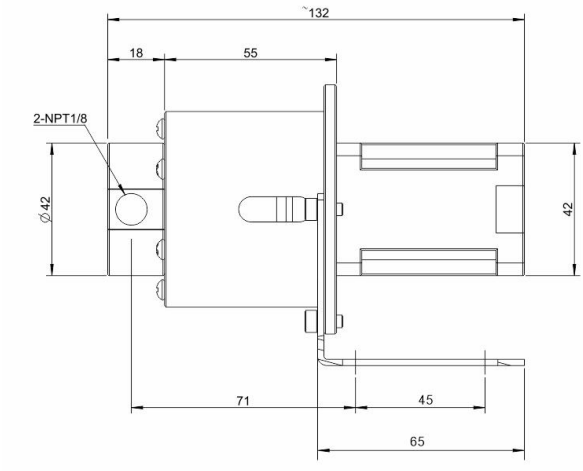

| Pumps order NO. | |
|---|---|
| MPG04 | head uniform dimensions |
| MPG08 | |

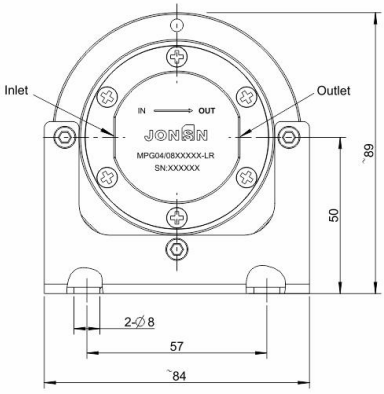
## MPG Servo Motor 220V/110V 40 Frame



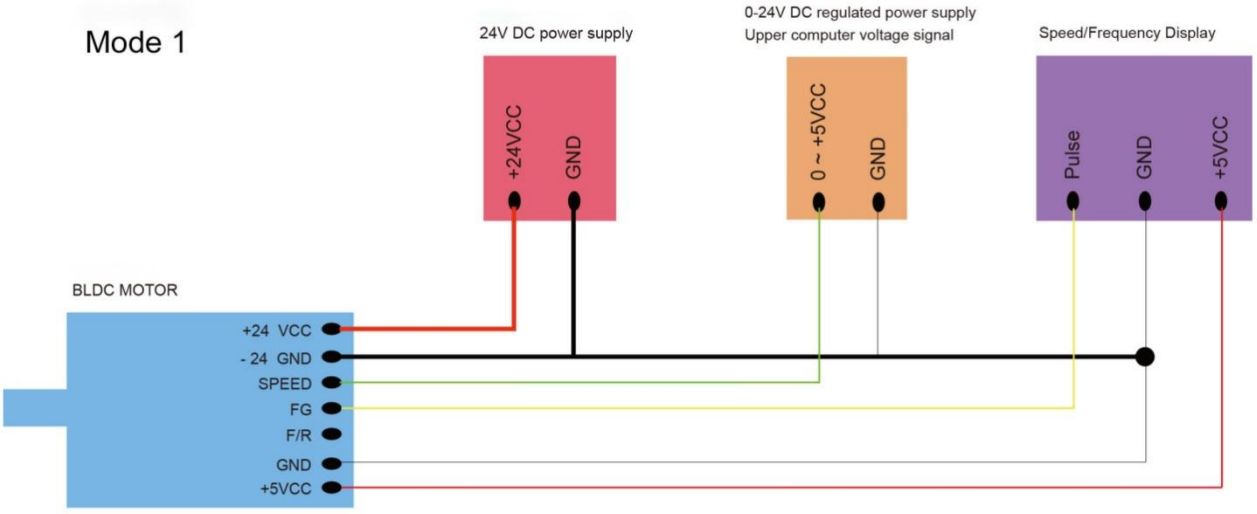




## MPG Stepper Motor 24V 42 Frame

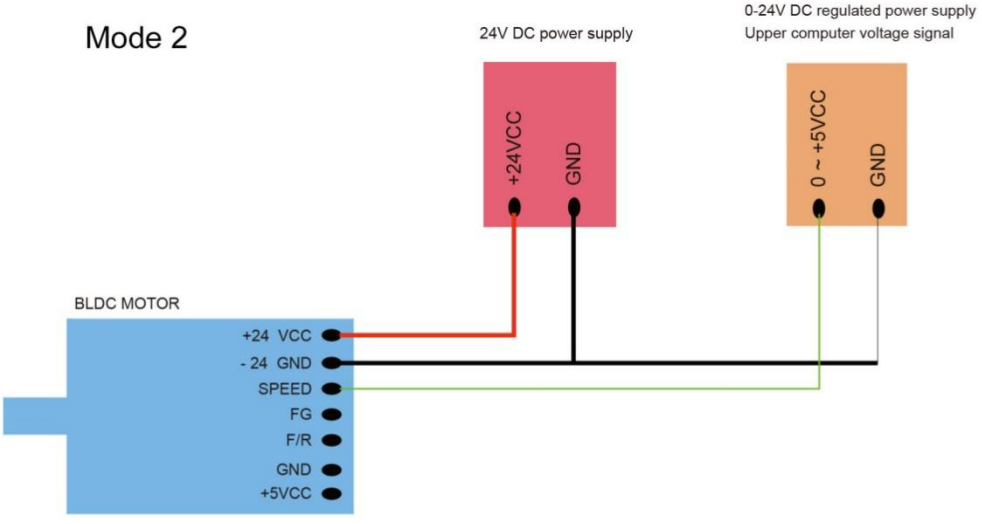


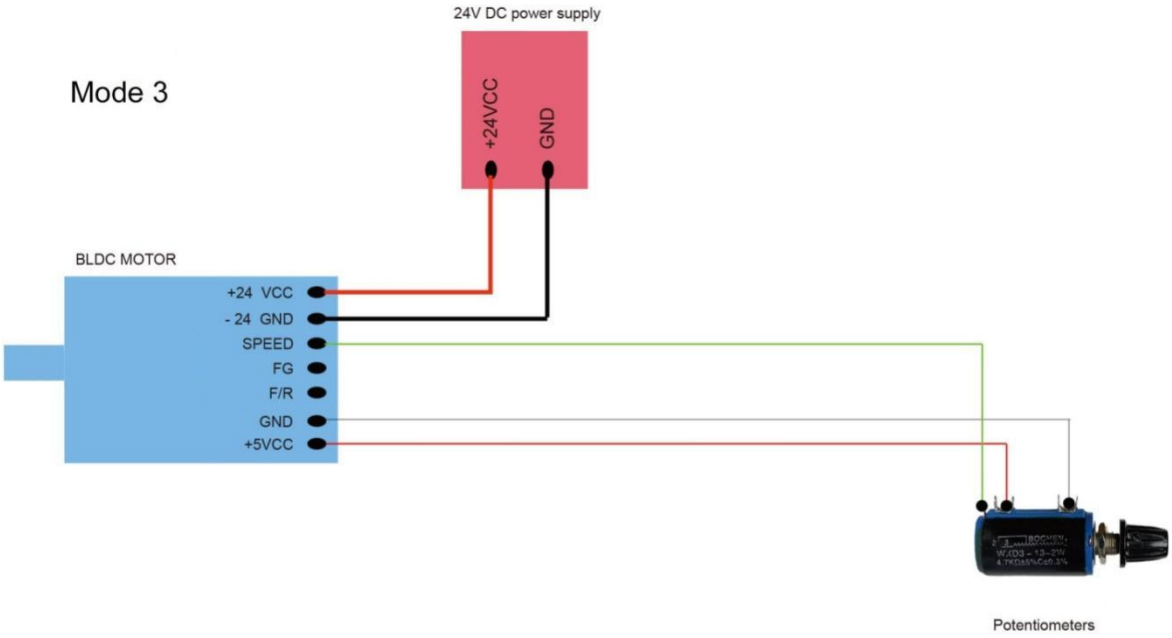
Mode 1


24V DC power supply
+24VCC
GND
0-24V DC regulated power supply
Upper computer voltage signal
0 ~ +5VCC
GND
Speed/Frequency Display
Pulse
GND
+5VCC
BLDC MOTOR
+24 VCC
- 24 GND
SPEED
FG
F/R
GND
+5VCC

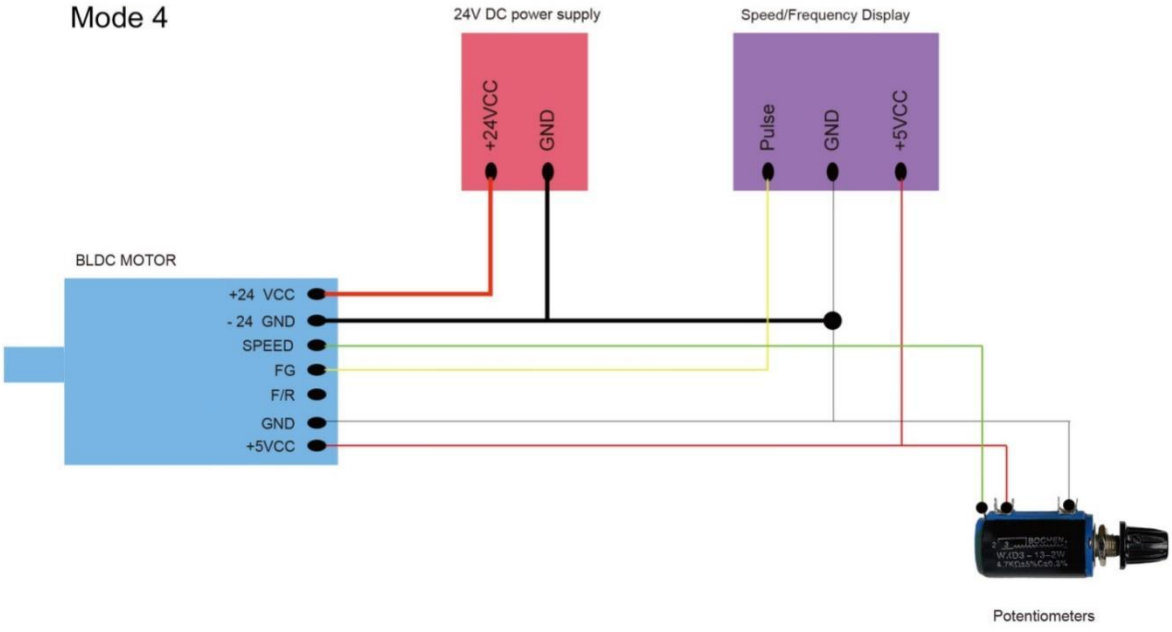
Mode 2


24V DC power supply
+24VCC
GND
0-24V DC regulated power supply
Upper computer voltage signal
0 ~ +5VCC
GND
BLDC MOTOR
+24 VCC
- 24 GND
SPEED
FG
F/R
GND
+5VCC

Mode 3

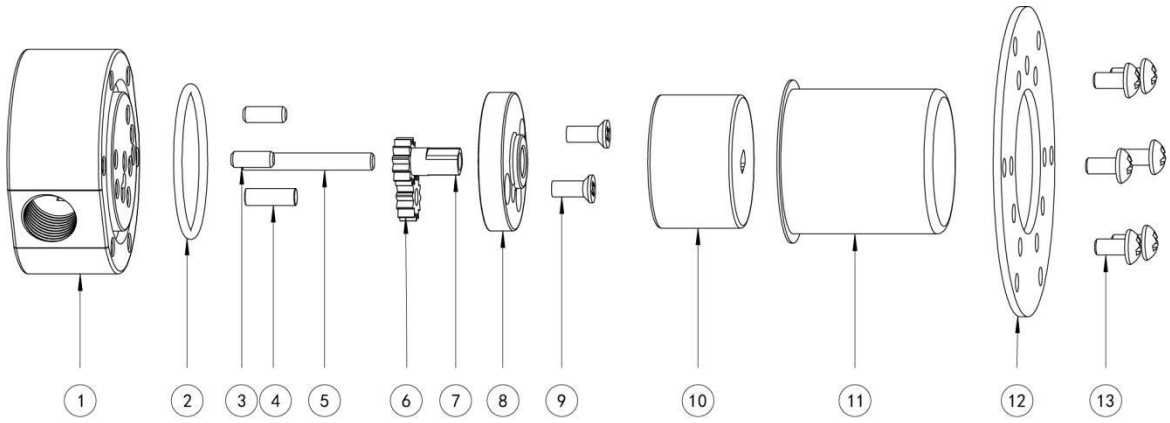

24V DC power supply
+24VCC
GND
BLDC MOTOR
+24 VCC
- 24 GND
SPEED
FG
F/R
GND
+5VCC
Potentiometers

Mode 4


24V DC power supply
+24VCC
GND
Speed/Frequency Display
Pulse
GND
+5VCC
BLDC MOTOR
+24 VCC
- 24 GND
SPEED
FG
F/R
GND
+5VCC
Potentiometers

# 8.Exploded View

## MPG




| Item No. | Part Name | Quantity |
|---|---|---|
| 1 | Pump case | 1 |
| 2 | O-ring | 1 |
| 3 | Locating pin | 2 |
| 4 | Drive ceramic shaft | 1 |
| 5 | Idle ceramic shaft | 1 |
| 6 | Drive gear | 1 |
| 7 | Idle gear | 1 |
| 8 | Gear cavity plate | 1 |
| 9 | Cross countersunk screw | 2 |
| 10 | Inner magnet | 1 |
| 11 | Shilding case | 1 |
| 12 | Pressing plate | 1 |
| 13 | Cross round screw | 6 |

# 9.Malfunction Analysis

| Items | Malfuntion | New Pump Troubleshooting Items | Old Pump Troubleshooting Items | Solutions |
|---|---|---|---|---|
| About flowrate | Motor normal working but without flowrate | 1.Joint sealing not good.<br>2.New pipelines not cleaned,welding slag particle or sealant entering pump body,cause gear jammed.<br>3.Overpressure or high viscosity,cause internal magnetic drive flat abrasion or driving shaft breakage.<br>4.Medium high or low temperature exceed seletion temperature,cause gear damaged or large gear gap.<br>5.Inside wetted parts corroded by medium. | 1.Internal magnetic drive plastic flat abrasion, cause magnetic drive dry rotating.<br>2.Filter jammed or not.<br>3.Gear,pump body,shaft sleeve abrasion, internal leakage heavy. | 1.Detecting system pressure, temperature, medium viscosity.<br>2.Clean filter.<br>3.Replace gear,internal magnetic driving, shaft sleeve. |
| | Small flowrate | 1.Low rotating speed.<br>2.Pipeline joint sealing not good.<br>3.Model selection not right, big differencce between selection viscosity with actual working viscosity. | | 1.Improve rotating speed.<br>2.Redo sealing.<br>3.Change big pump head and reduce rotating speed. |
| | Flow decreases | | Gear abrasion | Replace gear |
| | Instable flowrate | 1. Inlet pipe size too small.<br>2. Instable motor rotating speed.<br>3. Gear running not smmothly.<br>4. Inlet joint sealing not good.<br>5. Inlet filter dirty.<br>6. Instable outlet pressure.<br>7. Instable working temperature. | Inspect if gear abrasive or not. | 1.Inspect pipes sealing.<br>2.Inspect gear,pump body,pipe diameter.<br>3.Clean filter.<br>4.Replace gear. |
| About pressure | Have flowrate but without pressure | Outlet presssure is too small. | Gear,pump body,sliding shaft bearing abrasion, heavy internal leakage. | 1.Detecting syster pressure.<br>2.Change vulnerable parts. |
| | Pressure jumps severely | Oulet pressure too high or mismatch between pipe diameter and flow speed. | Gear,pump body abrasion | Inspect gear,pump body,pipe diameter. |
| About bubbles | Outlet has bubbles | 1.Joint sealing not good.<br>2.Inlet pipe too small, mismatch between pipe diameter and flow speed.<br>3.Inlet pipe filter jammed. | | 1.Redo sealing.<br>2.Inspect gear,pump body,pipe diameter.<br>3.Clean filter. |
| About motor | Motor vibration | 1.When assemble pipes over stress,cause external magnetic drive not centering with shielding case,then have friction sound.<br>2.Valves not open,overpressure.<br>3.Motor shaft bearing damaged. | | 1.Reassemble pipes and fixed bracket to reduce the stress.<br>2.Front & back valves open before start.<br>3.Change motor shaft bearing |
| | Motor doesn't run | Wrong connection. | | Inspect circuit. |
| | DC motor doesn't run | DC motor open overcurrent,driver components burn out. | Motor driver burn out. | Change motor. |
| | DC motor stops suddenly | Pump overloading,motor temperature rise too high,trigger driver temperature control switch. | Have foreign matters,gear jammed. | 1.Change high power motor.<br>2.Clean internal gear. |
| About abnormal sound | Overpressure | Outlet pipe jammed. | | Clean outlet pipe. |
| | Gearjammed,trip magnet | Foreign matters entering. | | Add filter at pump front. |
| | Power shortage | Motor overload, overcurrent. | | Change high power motor. |
| | Large gear gap | | Gear abrasion | Replace gear. |

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