

PRECISION MICRO GEAR PUMP
COMPATIBLE WITH DC MOTORS

COMPREHENSIVE CATALOG

Attentively focus on producing
each precision gear pump

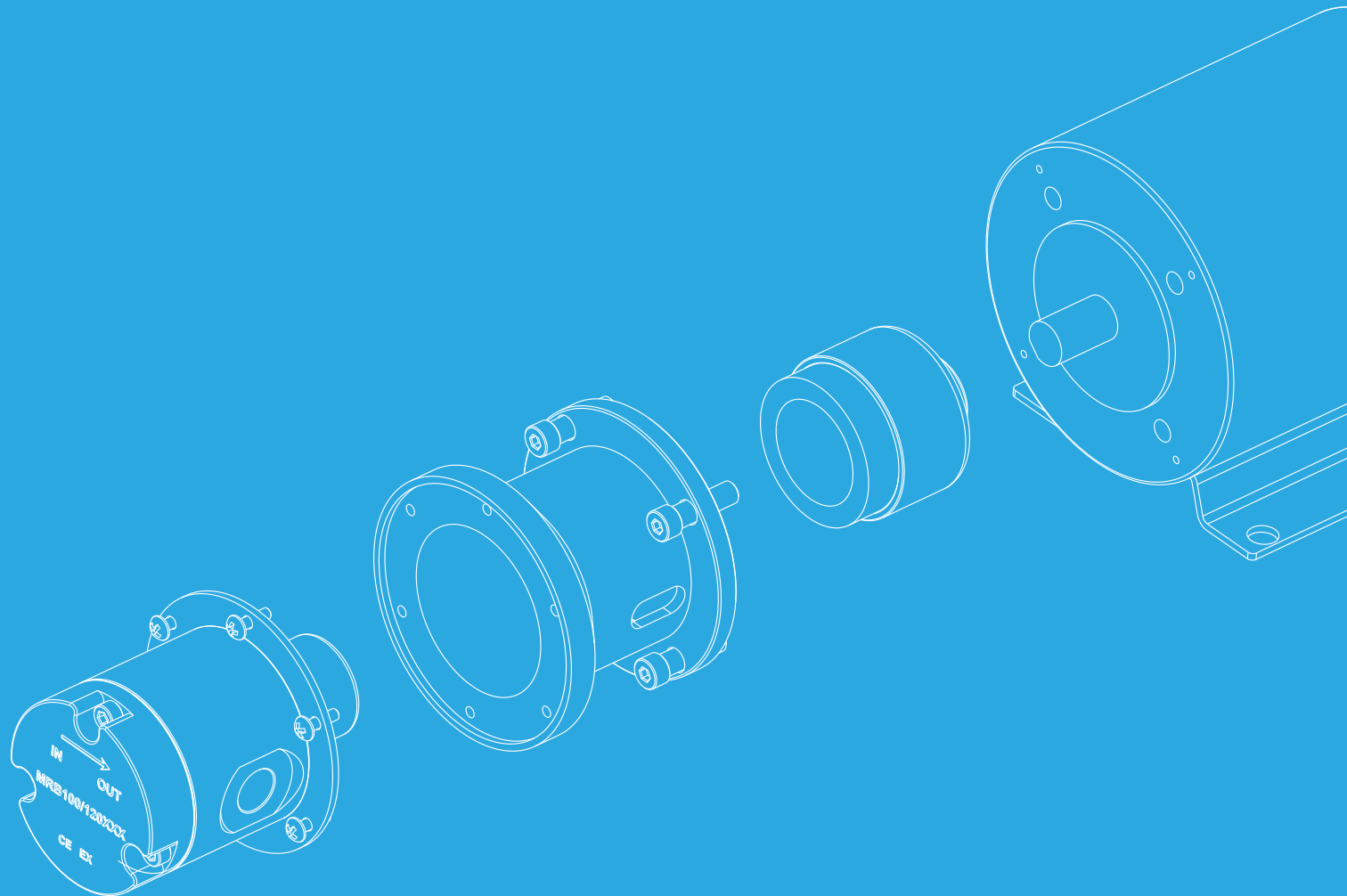
INTEGRATED CATALOG



PRECISION-GRADE MICRO GEAR PUMP - DC MOTOR

- JONSN Precision Grade Micro Gear Pump - DC Motor
- Suitable for fluid transfer equipment that is small in size, cost-optimized, and structurally compact.
- It features good flow linearity and long service life.
- Selectable DC voltages such as 12V/24V/36V/48V can be used according to power supply requirements,
- and pump speed, and thus flow rate, can be controlled through methods like 0-5V or 0-10V, PWM, and potentiometers.

They play an important role in analytical or medical equipment, charging piles, semiconductors, inkjet, fuel cell technology, on-board urea systems, cooling circuits, and compact flow controllers. In this manual, you will find the performance curve of JONSN precision grade micro gear pumps with DC motors, facilitating the selection and use by technical engineers.



DEDICATE AND FOCUS ON CRAFTING EACH PRECISION-GRADE GEAR PUMP WITH UTMOST CARE

CATALOG

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MPG + DC MOTOR PERFORMANCE CURVE.
[How to Find Motor Speed and Calculate Shaft Power?](#)

MRA+BLDC MOTOR

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MRA + DC MOTOR PERFORMANCE CURVE.
MRA+ DC Motor High Voltage Performance Curve.

MRB+BLDC MOTOR

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MRE+BLDC MOTOR

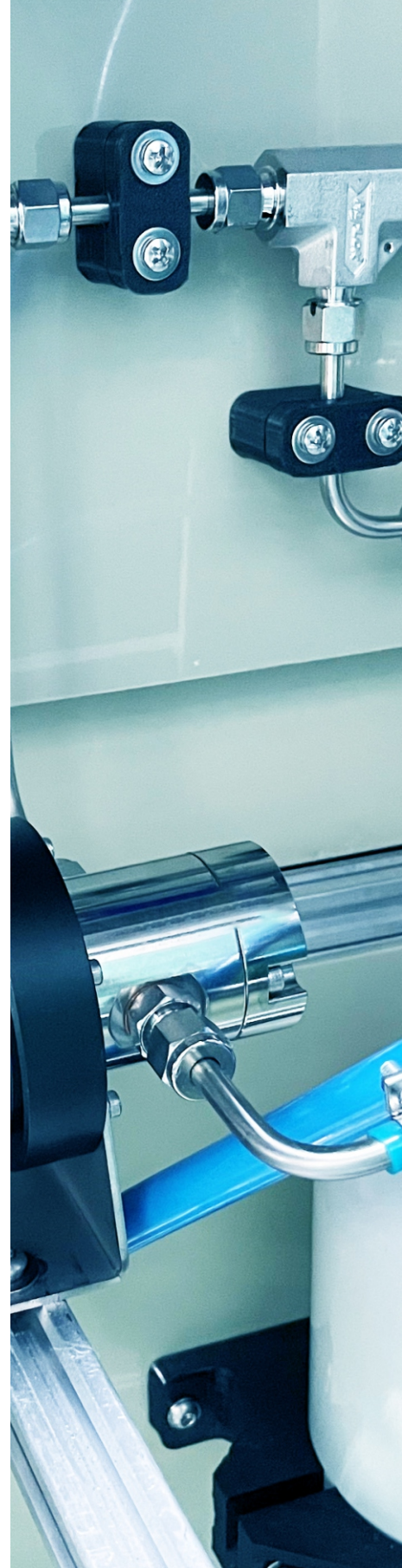
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MRE+ Brushless Motor Dimension Drawing.
MRE + DC MOTOR PERFORMANCE CURVE.
MRE+ DC Motor High Voltage Performance Curve. 43
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MRV+BLDC MOTOR

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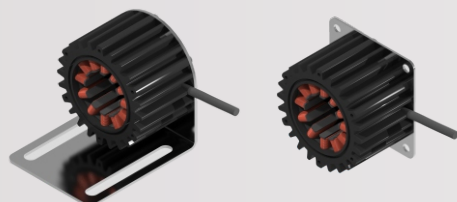
MRV+ Brushless Motor Dimension Drawing.
MRV + DC MOTOR PERFORMANCE CURVE.
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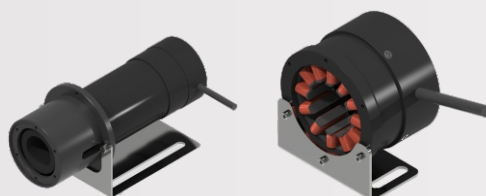
BLDC MOTOR

01

MPG | MRA | MRB | MRC | MRE | MRF | MGA



40-70w



100-120-150w



200-300-400w



600-1000-1500-2000w

DC MOTOR POWER MATCHING TABLE

pump size	Brushed motor	Brushed motor											
	24V25W	24V40W	24V70W	24V100W	24V120W	24V150W	24V200W	24V300W	24V400W	24V600W	24V1000W	48V1500W	48V2000W
MPG	*	*											
MRA	*	*	*	*	*	*	*	*					
MRB			*	*	*	*	*	*					
MRC								*	*	*	*	*	
MRE										*	*	*	*
MRF										*	*	*	*

BASIC PARAMETERS

voltage	DC24V	DC24V	DC24V	DC24V	DC24V	DC24V	DC24V	DC24V	DC48V	DC48V	DC48V
power	40W	70W	100W	150W	300W	400W	600W	1000W	1000W	1500W	2000W
Speed regulation	Analog signal: 0 - 5V / PWM										
speed range	500~4000 rpm (Other speeds can be customized)										
Starting voltage	0.5V										
Insulation class	Class F										
Ambient temperature	-40~60°C										
Locked - rotor protection	Locked-rotor current: 3A	Locked-rotor current: 3A	Locked-rotor current: 4A	Locked-rotor current: 5.5A	Locked-rotor current: 12A	Locked-rotor current: 16A	Locked-rotor current: 25A	Locked-rotor current: 41A	Locked-rotor current: 20A	Locked-rotor current: 31A	Locked-rotor current: 41A
Over - temperature protection	√	√	√	√	√	√	√	√	√	√	√

PROTECTION FUNCTIONS

Locked - rotor protection

When the motor starts, if faults such as pump overpressure or jamming occur, the motor will shut down immediately. The power supply needs to be restarted after the fault is eliminated to remove the protection.

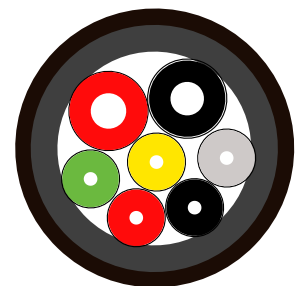
Over - temperature protection

The motor driver will shut down for protection when its temperature exceeds 130°C. The protection will be automatically released after the driver cools down, allowing restart.

NOTE

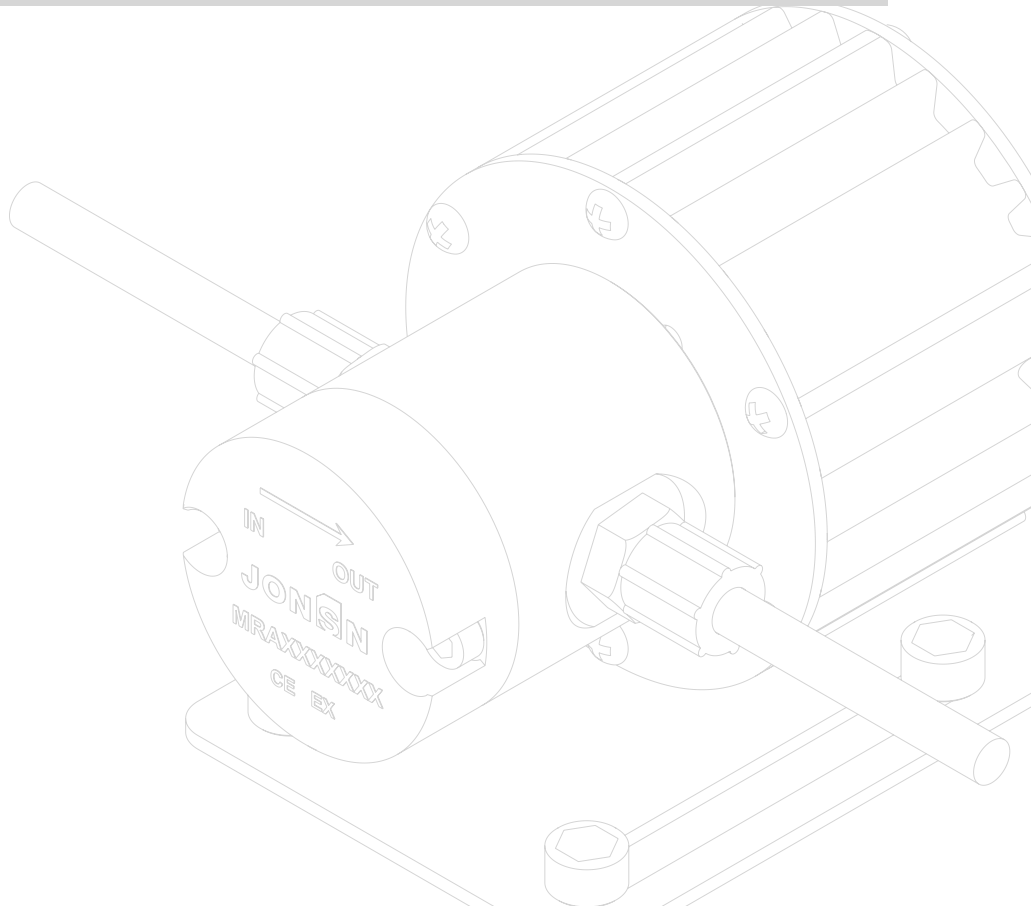
1.The green wire is the speed regulation signal input. The input voltage must not exceed 5V (or the equivalent voltage of the PWM duty cycle). Otherwise, it will cause a driver failure.

2.The yellow wire is the output line for the speed pulse signal. No live signal must be input into it, otherwise it will cause a failure in the speed feedback function.



POWER SUPPLY CORD DEFINITION

● Red wire: Vcc+	24V+ power supply input	The continuous operating voltage must not exceed 10% above the rated voltage.
● Black wire: GND / V-	GND (Common ground), 24V- (Negative 24V power supply), Speed control voltage V- (Negative terminal of speed control voltage), Speed feedback instrument V- (Negative terminal of speed feedback signal)	
● Green wire	0-5V+ or PWM speed control signal input	
● Yellow wire	Speed pulse signal output (2 pulses per motor revolution)	
○ White wire	Forward/Reverse Control Line (Default: Forward when open, Reverse when connected to GND)	
● Red thin wire	5V Output (Reserved for potentiometer knob speed control. When the potentiometer is not in use, ensure proper insulation/isolation to prevent accidental contact with other circuits which may cause malfunctions.)	
● Black thin wire	GND Common (Reserved for potentiometer knob speed control. When the potentiometer is not in use, ensure proper insulation to prevent accidental contact with other circuits that may cause malfunctions.)	

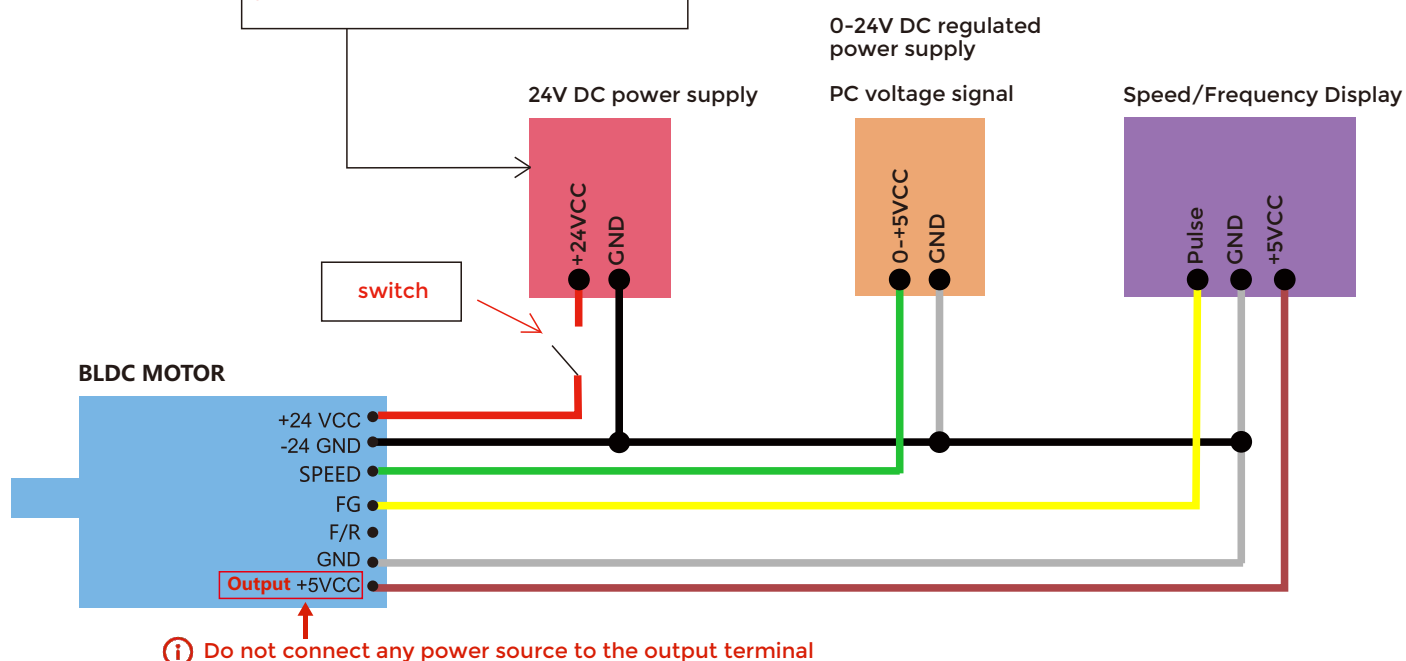


PROTECTION FUNCTIONS

04

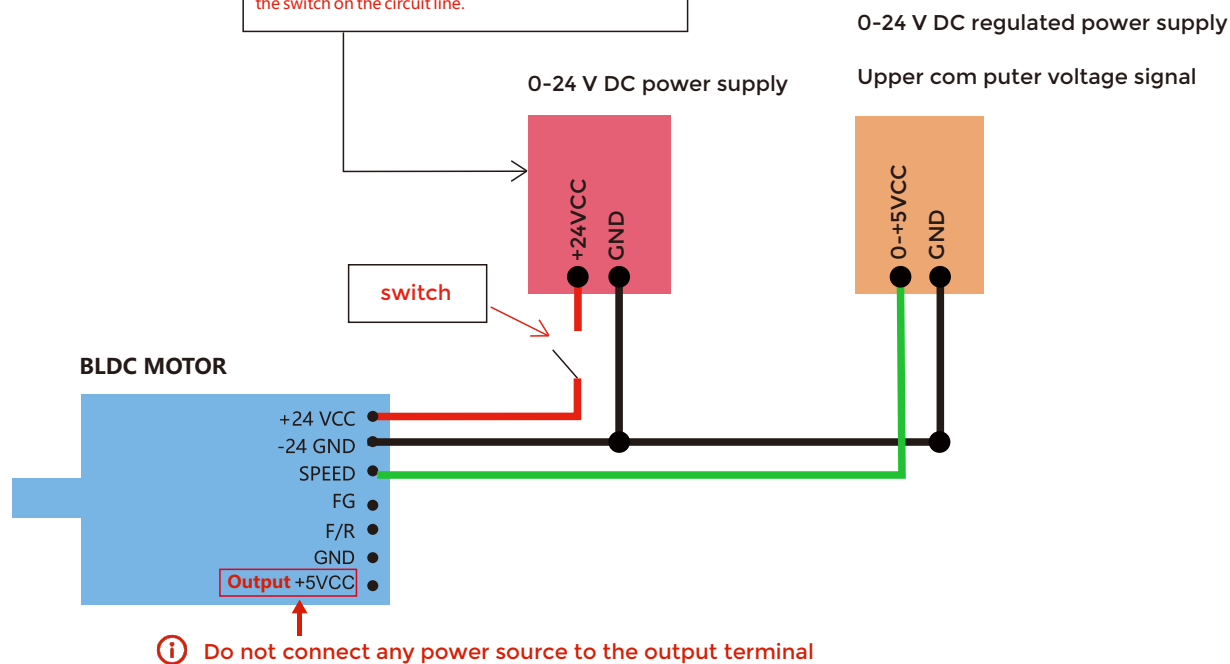
Mode1

High-power switch-mode power supply generates significant inrush voltage and current during startup. Directly connecting a motor is strictly prohibited, as it may cause breakdown of circuit board components. Wait until the voltage and current stabilize, then power on via the switch on the circuit line.



Mode2

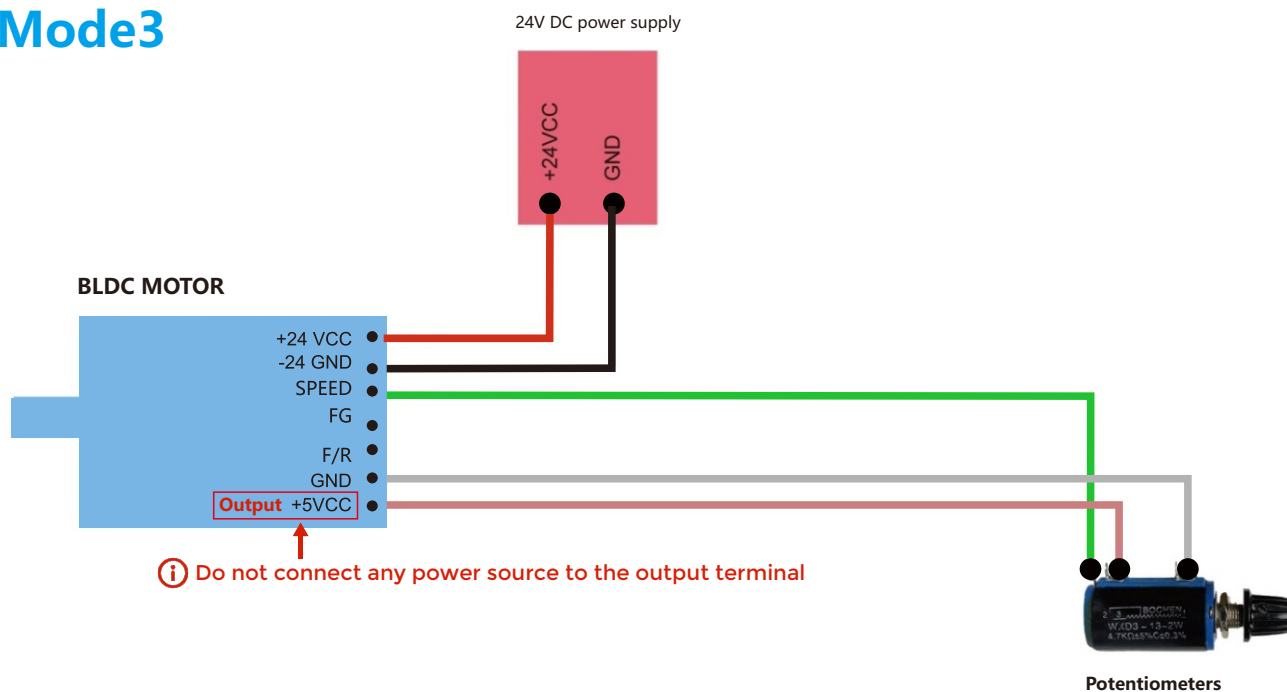
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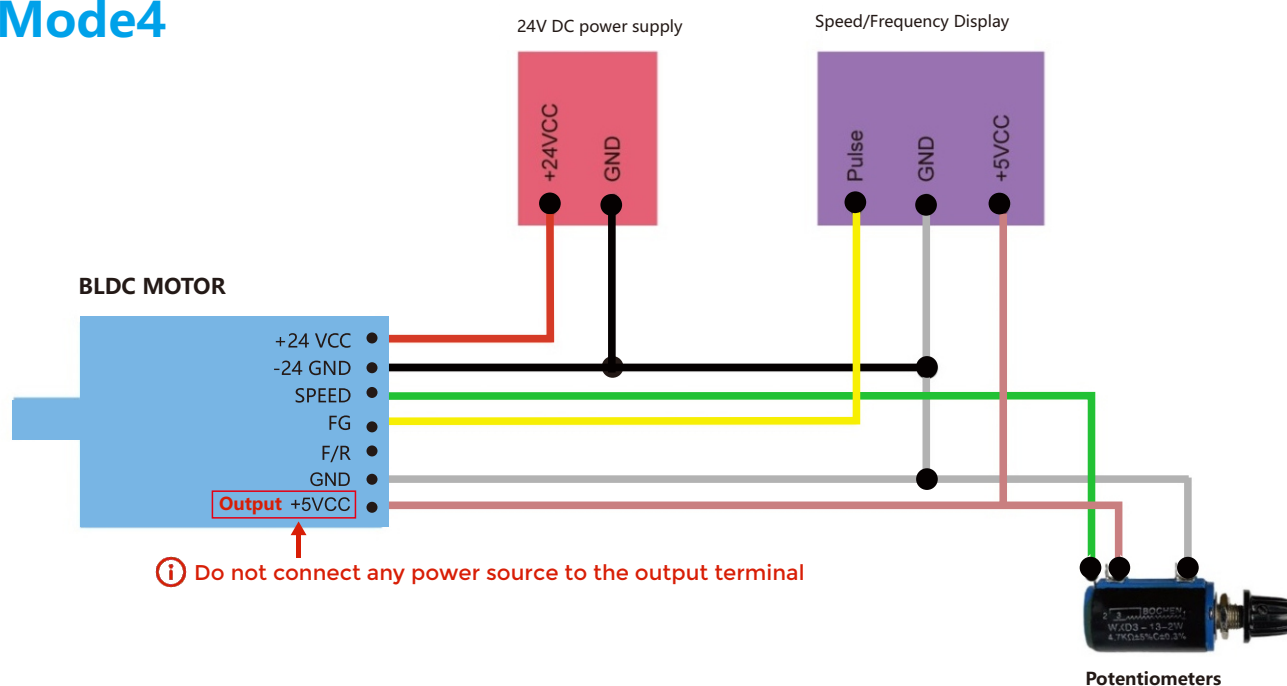
PROTECTION FUNCTIONS

05

Mode3



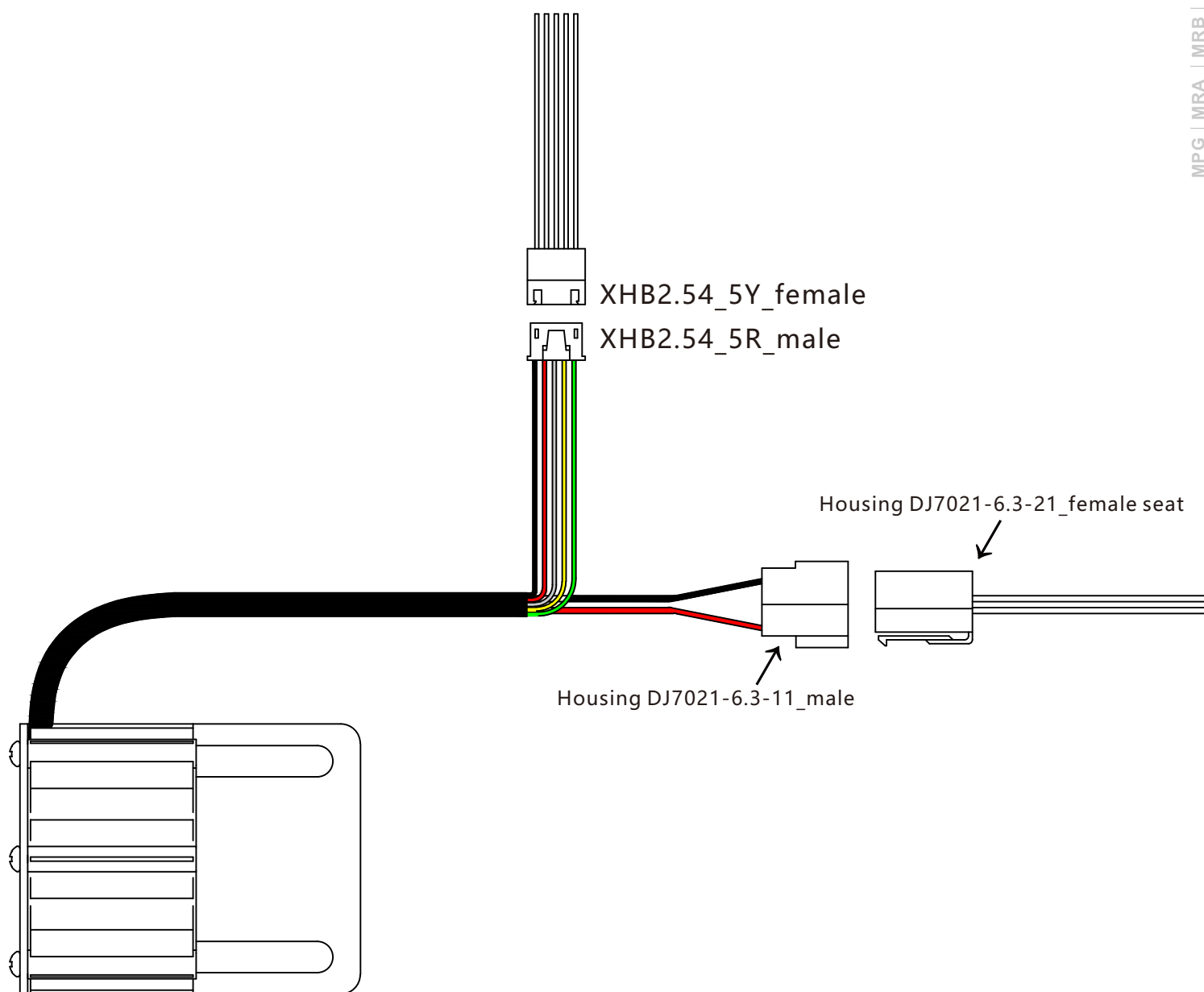
Mode4



POWER CORD QUICK CONNECTOR SPECIFICATIONS

06

MPG | MRA | MRB | MRC | MRE | MRF | MGA



■ APPLICABLE MOTOR

40W/70W/100W/150W

INDUSTRY APPLICATIONS

ANALYTICAL INSTRUMENT EQUIPMENT

MPG

MRA

Industry Characteristics

Precisely control fluid parameters, including flow rate, pressure, stable flow velocity, and chemical compatibility. These parameters and control methods collectively ensure the stability and accuracy of the analytical instruments, making them suitable for a wide variety of analytical requirements.

Application Points

Function Modules: Reagent delivery, sample aspiration, dispensing, dilution, cleaning, and waste liquid disposal, along with analytical equipment support systems
Transport Medium: Reagents and corrosive aqueous solutions.

Conveying Medium

Reagents and corrosive aqueous solutions.

Flow Range

Variable flow rates up to 1000 mL/min
(current minimum displacement: 0.04 cc/rev)

Pressure Range

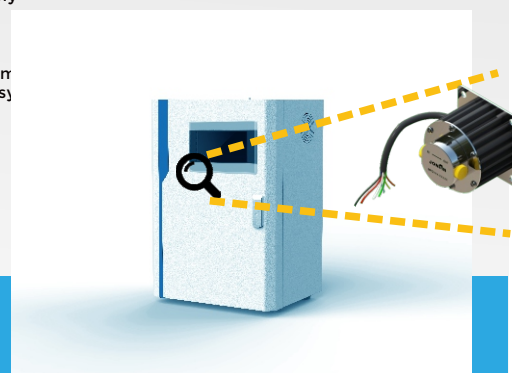
Variable pressures up to 6 Bar (maximum operating pressure)

Suitable Pump Types

MPGA004, MPGA008, MRA5/13, MRA7/13, MRA10/13, MRA12/13

Suitable Motors

Brushless DC Motors: 24V 40W / 24V 70W (standard high-efficiency models)
Precision Control Alternatives: Servo motors or stepper motors for high-accuracy applications



Our Advantages:

The JONSN precision micro gear pump features high accuracy and pulse-free linear flow output.

- Adopts shielded leak-free structural design with modular installation, enabling easy cleaning and maintenance
- Made of 316L stainless steel with precision machining forming
- Gears adopt high-strength VICTREX® PEEK, heat treatment technology and wear-resistant zirconia ceramic
- The sliding bearing adopts modified PEEK composite nano-ceramic formula
- Gears and sliding bearings deliver excellent wear resistance, with an overall service life of up to 20,000 hours

HIGH POWER LIQUID-COOLED SUPERCHARGING STATION

MRV

Industry Characteristics

The maximum output power of liquid-cooled ultra-fast charging piles is usually 600 kW. Equipped with a liquid cooling heat dissipation system, it effectively dissipates massive heat generated by high-power charging, ensures stable operation of charging equipment, extends service life, and improves charging efficiency and operational safety.

Application Points

Stable flow rate, low motor energy consumption, compact structure, and strong adaptability to outdoor environments

Conveying Medium

Low-viscosity silicone oil for circulating cooling

Flow Range

Common flow rate: 4–6 L/min; partial models: 10–15 L/min

Pressure Range

less than 6 ba

Suitable Pump Types

MRV220

Suitable Motors

Brushless motor, 24V 150W



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INDUSTRY APPLICATIONS

DIALYSIS MACHINE

MRV

MRA

Industry Characteristics

As the power source for fluid delivery in hemodialysis machines and renal dialysate circulation, the pump delivers stable and controllable flow.

Flow rate

approx. < 2 L/min, with stable delivery and a wide flow range. The rotating speed is adjustable on demand to meet the flow velocity requirements of dialysate.

Operating Pressure

< 3 bar, negative pressure at pump inlet

Temperature

High-temperature sterilization at 80–90 °C is required.

Applicable Pump Types

MRA12/13 , MRB12/16, MRV125

Applicable Motors

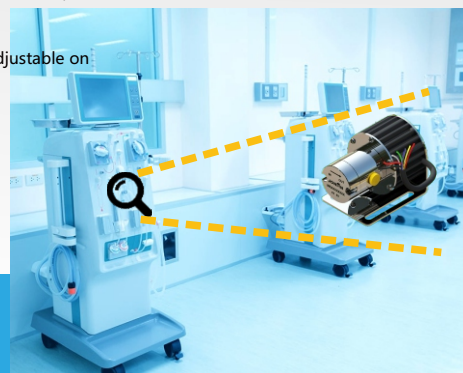
Motors are selected according to the hemodialysis machine model
Brushless: 24V 40W, 24V 70W; or Brushed: 24V 25W

Our Advantages:

Gears adopt high-strength VICTREX® PEEK, heat treatment technology and wear-resistant zirconia ceramic

The sliding bearing adopts modified PEEK composite nano-ceramic formula

Gears and sliding bearings deliver excellent wear resistance, with an overall service life of up to 20,000 hours



DIESEL ENGINE SELECTIVE CATALYTIC REDUCTION (SCR) EMISSION CONTROL SYSTEM

MRA

MRB

Industry Characteristics

It reduces NOx in exhaust gas into harmless nitrogen (N₂) and water vapor (H₂O), effectively controlling emissions and meeting regulatory requirements.

Application Points

Linear and stable flow delivery

Medium

30% Urea Solution

Flow Range

< 900 L/h, adjustable

Pressure Range

6–10 bar

Applicable Pump Types

MRA7/13 , MRB12/16, MRB19/16, MRC12/37, MRE24/37, MRV175

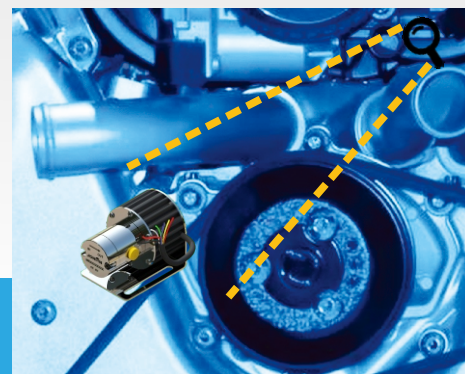
Applicable Motors

24V 70W, 24V 150W, 24V 300W, 24V 600W, 24V 1000W

Our Advantages:

The JONSN precision micro gear pump features high accuracy and pulse-free linear flow output.

- Adopts shielded leak-free structural design with modular installation, enabling easy cleaning and maintenance
- Made of 316L stainless steel with precision machining forming
- Gears adopt high-strength VICTREX® PEEK, heat treatment technology and wear-resistant zirconia ceramic
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- Gears and sliding bearings deliver excellent wear resistance, with an overall service life of up to 20,000 hours



BLDC MOTORS

MPG pump head + DC brushless motor

09

MPG Series Micro Gear Pump Flow rate: 1–135ml/min

MPG004 Displacement: 40 μ l/r. It covers a flow range of 1–135 ml/min, featuring a wide adjustable range for micro flow, with a working differential pressure of 2 bar.

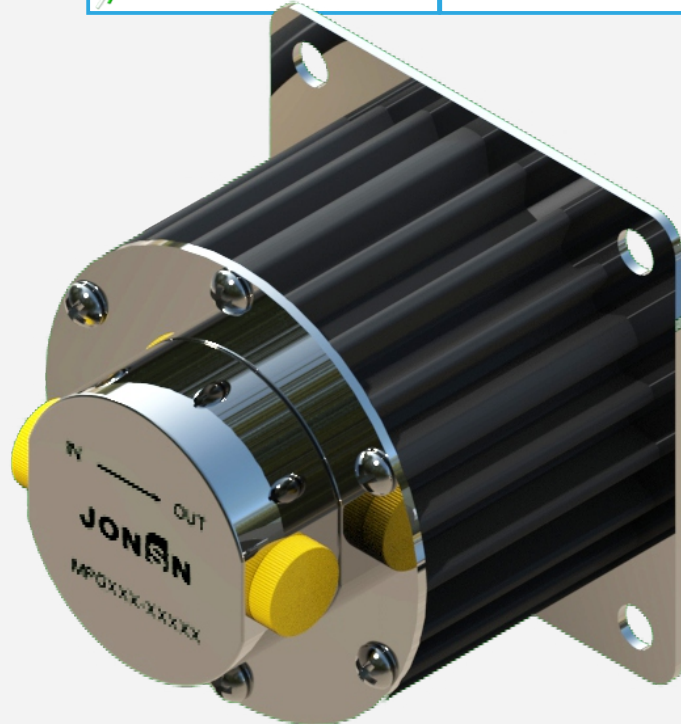
MPG008 Displacement: 80 μ l/r. It covers a flow range of 15–280 ml/min, featuring a wide adjustable range for micro flow, with a working differential pressure of 5 bar.

The MPG series micro gear pumps deliver stable and precise flow with compact size. They are widely applied in medical treatment, biochemical instruments, fuel cells, renal dialysis, inkjet printing, experimental analyzers and other industries.

MPG + 40/70W



MPG + 100/120W



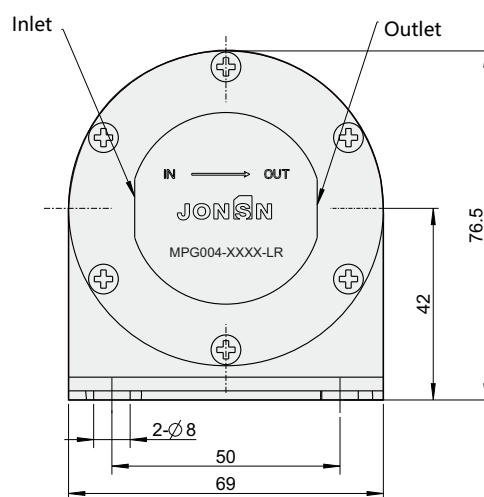
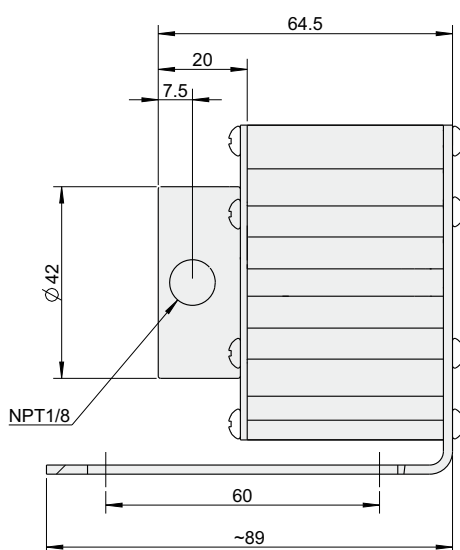
BLDC MOTORS

MPG pump head + DC brushless motor

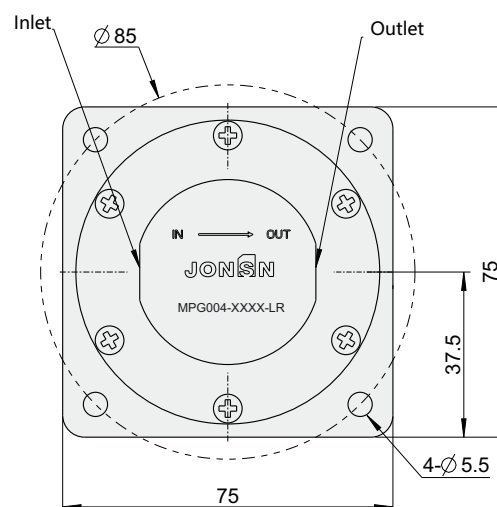
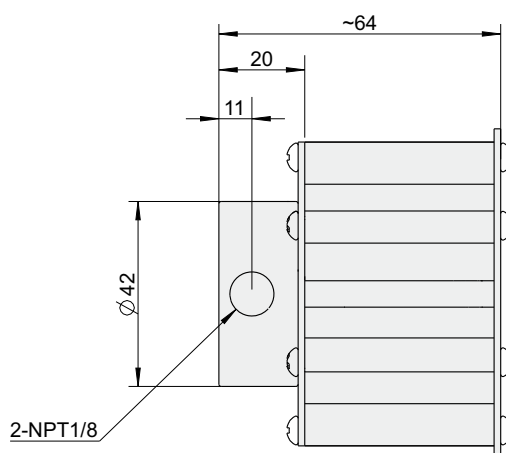
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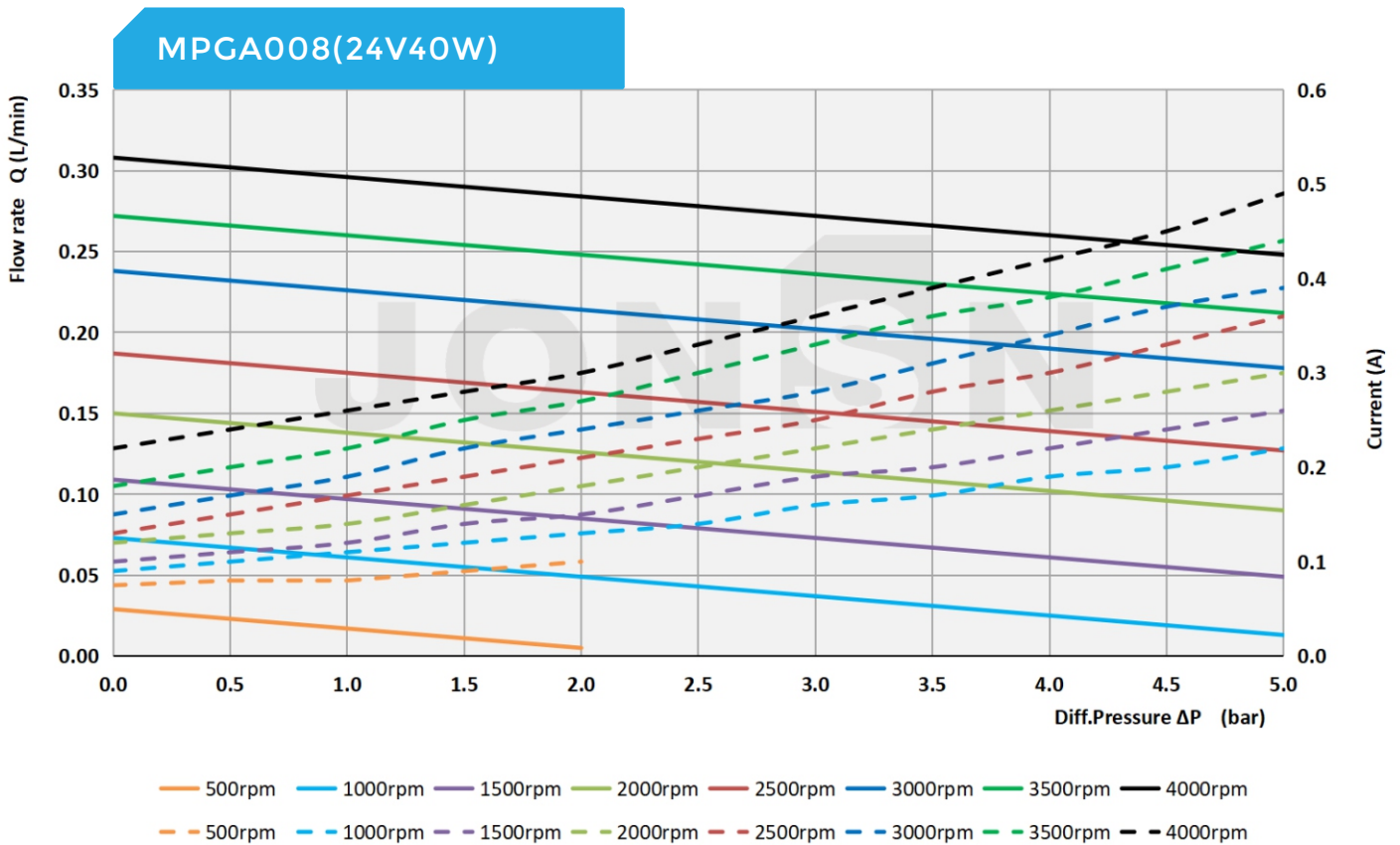
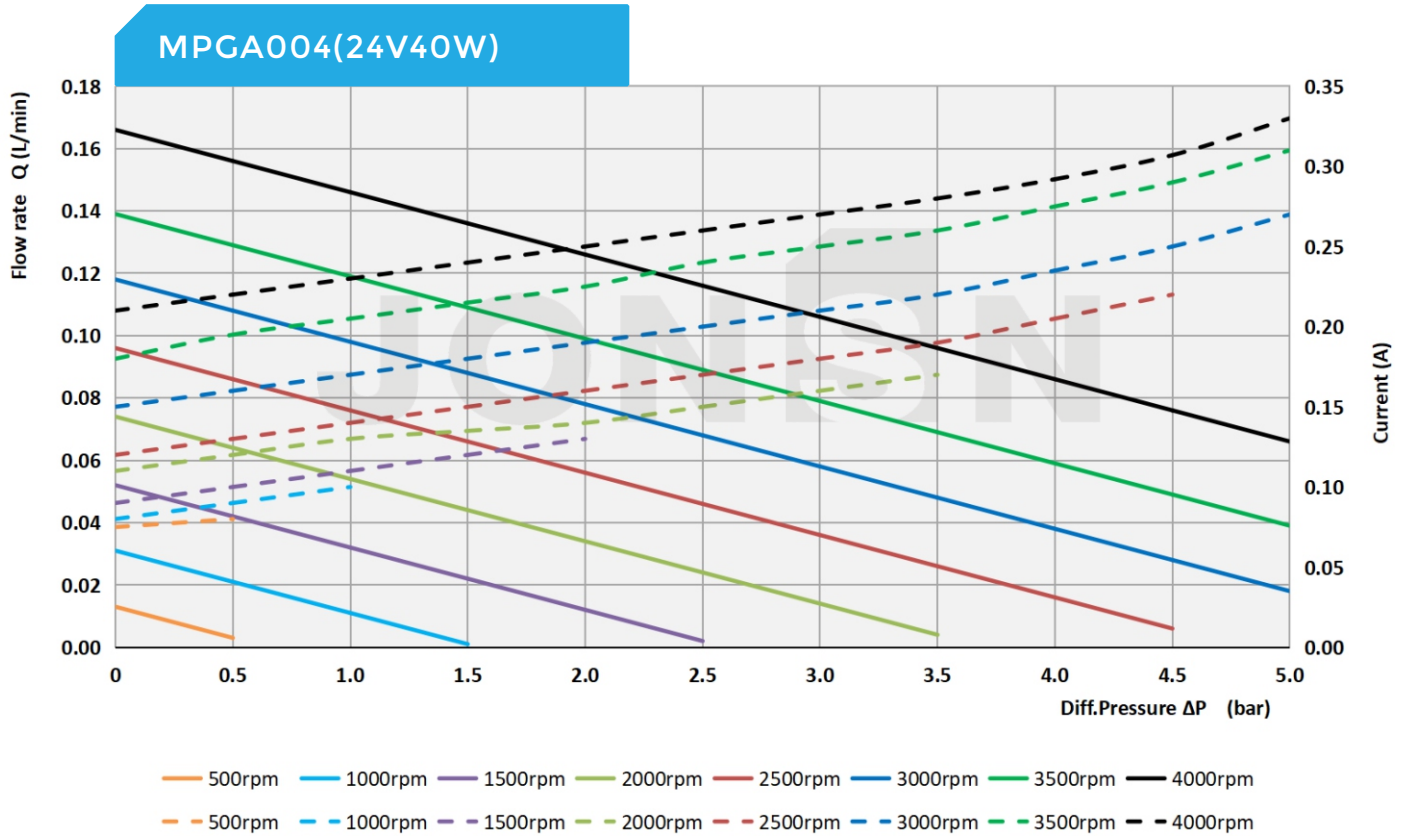
MPG | MRA | MRB | MRC | MRE | MRF | MGA

Pump Model	Brushless Motor	
MPGA004	40W/70W brushless motor, base plate mounting	unified dimension
MPGA008		



Pump Model	Brushless Motor	
MPGA004	40W/70W brushless motor, square flange mounting	unified dimension
MPGA008		





HOW TO FIND CALCULATIONS FOR MOTOR SPEED AND SHAFT POWER?

FOR EXAMPLE

- 1** Operating Condition: Transport Medium - Water.

Flow Rate Requirement: 0.6L/min.

- 2** Pressure: 4 bar.

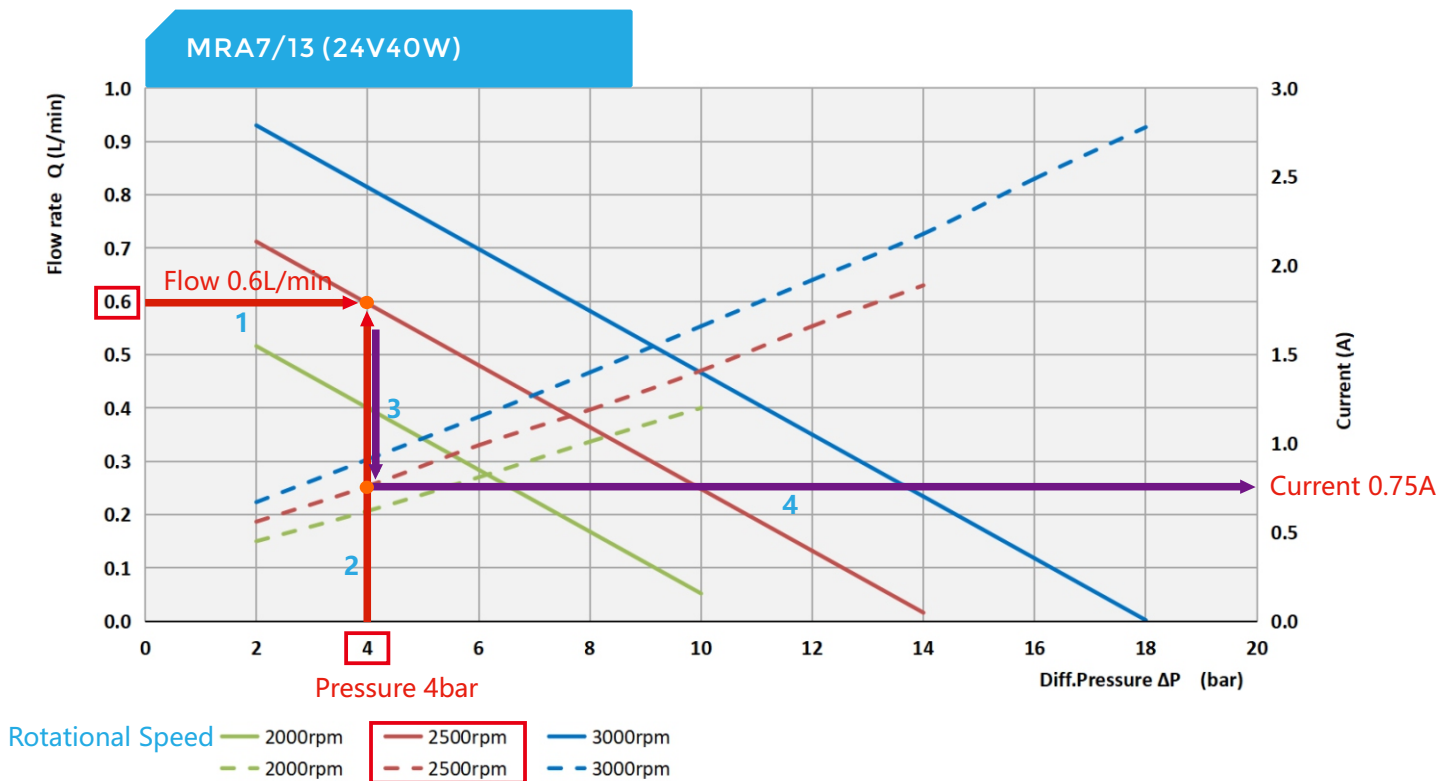
To find the motor speed and calculate the shaft power, locate the flow point at 0.6L/min and the pressure point at 4 bar.

The corresponding red solid line indicates a speed of 2500 rpm.

- 3** At the pressure point of 4 bar, the corresponding red dashed curve indicates a speed of 2500 rpm.

- 4** The corresponding current is: 0.75A. The shaft power $P = 24V \times 0.75A = 18W$.

MRA7/13 + 40W



BLDC MOTORS

MRA + DC Brushless Motor

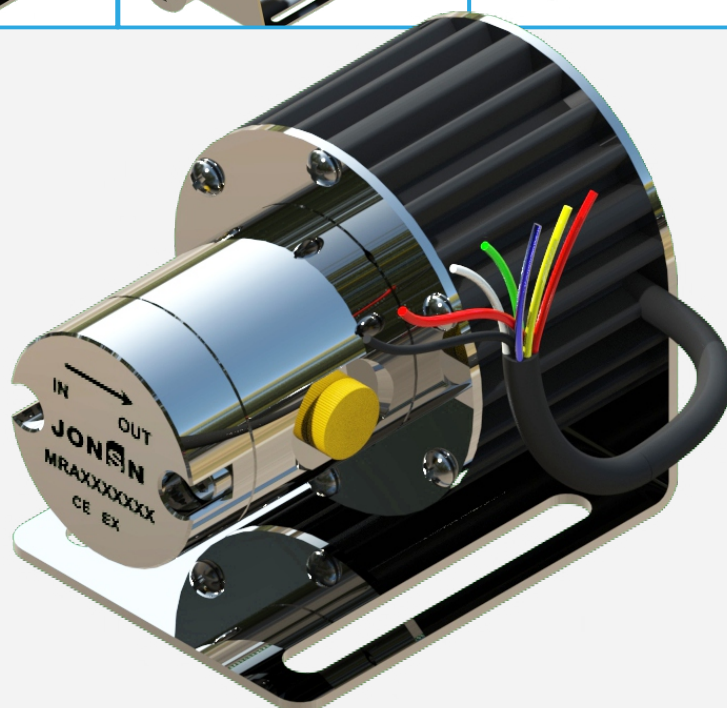
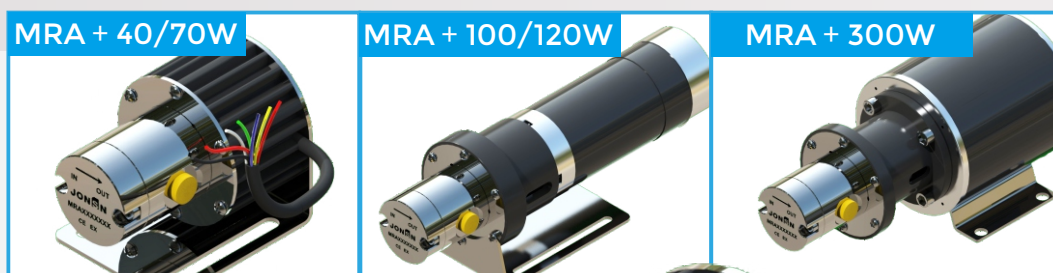
13

MRA Series Micro Gear Pump & 100ml-2500ml/min.

Capable of handling flow rates from 100ml to 2500ml/min and working pressure differentials from 0.5 to 25 bar.

Viscosity range from 0.4 to 3000 mPa·s (approximately similar to water) under operating conditions, with a pump pressure resistance of 4 Mpa.

JONSN Precision-grade Micro Magnetic Gear Pump can be used for: micro-dosing, addition, lubrication, spraying, dispensing, sampling, inkjet printing, pressurization, circulation, coating, spraying, metering, and other pumping systems for liquids.



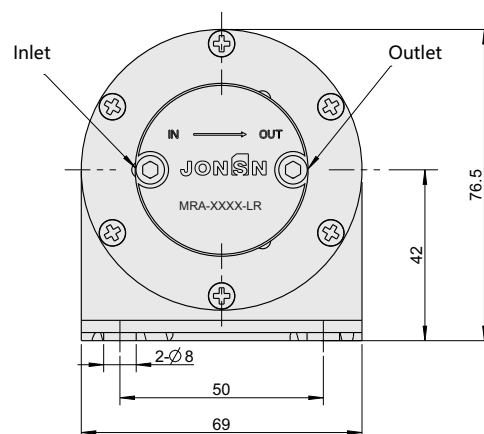
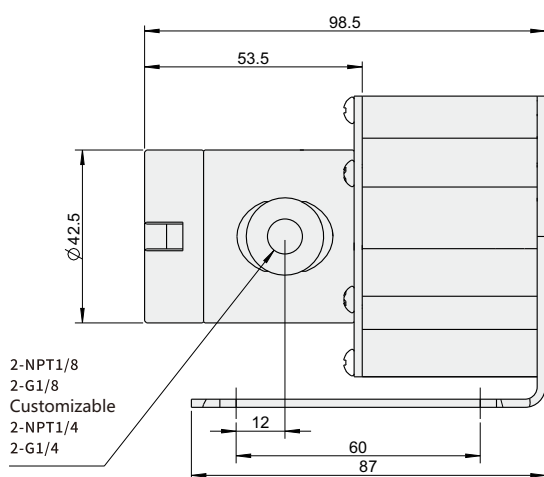
BLDC MOTORS

MRA + DC Brushless Motor

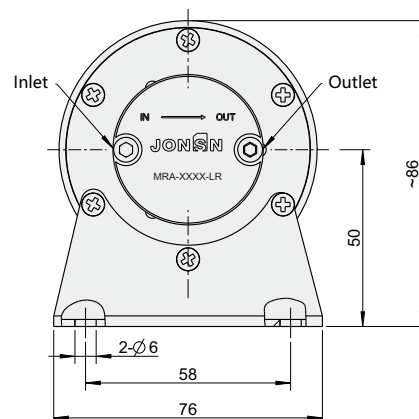
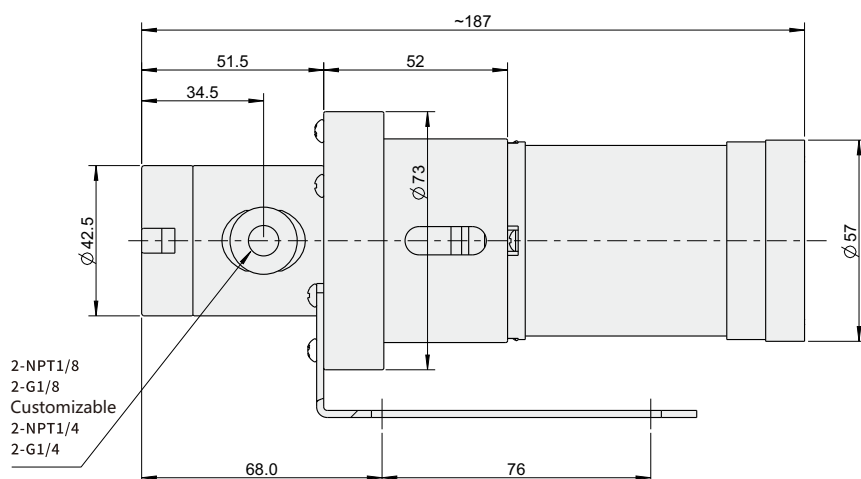
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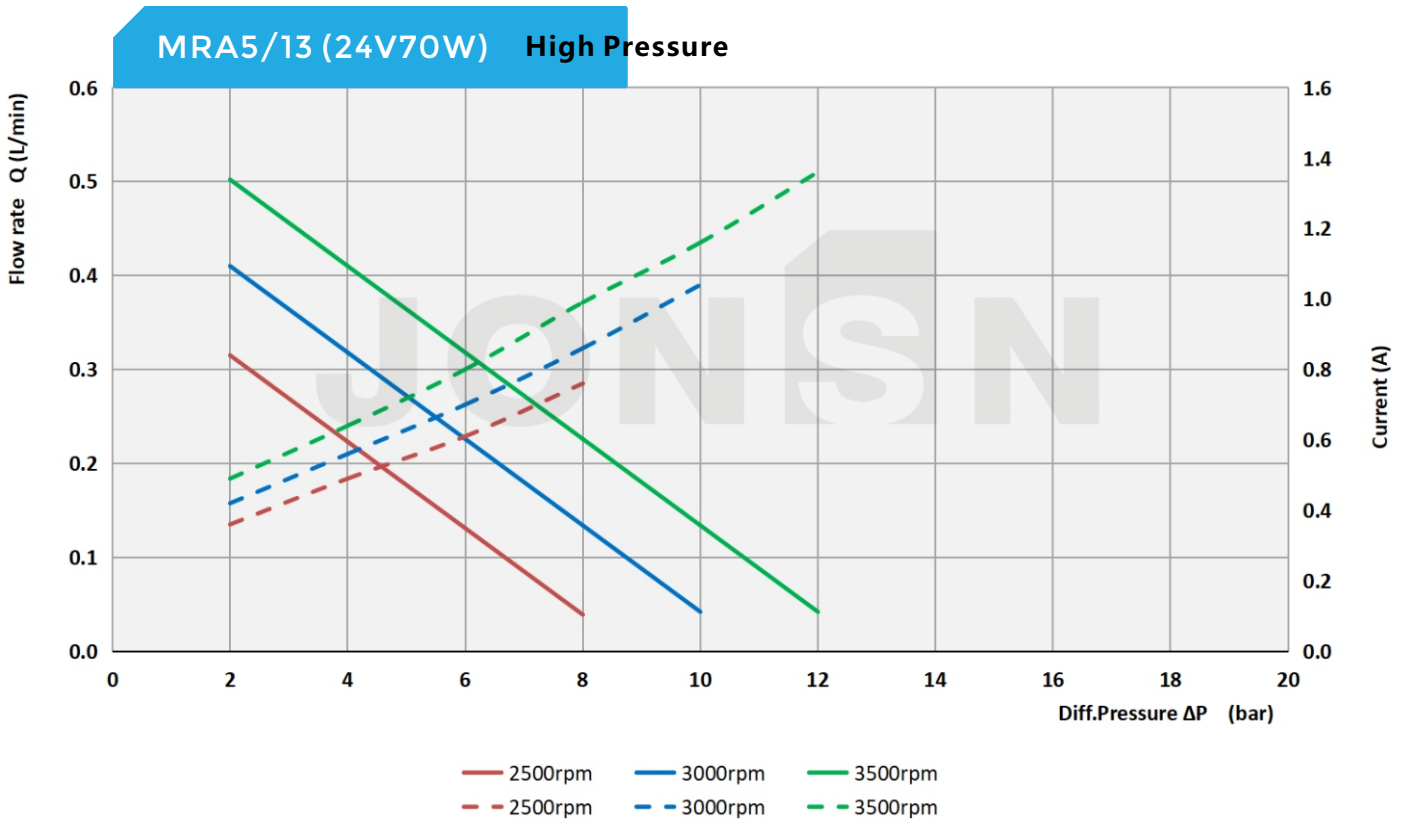
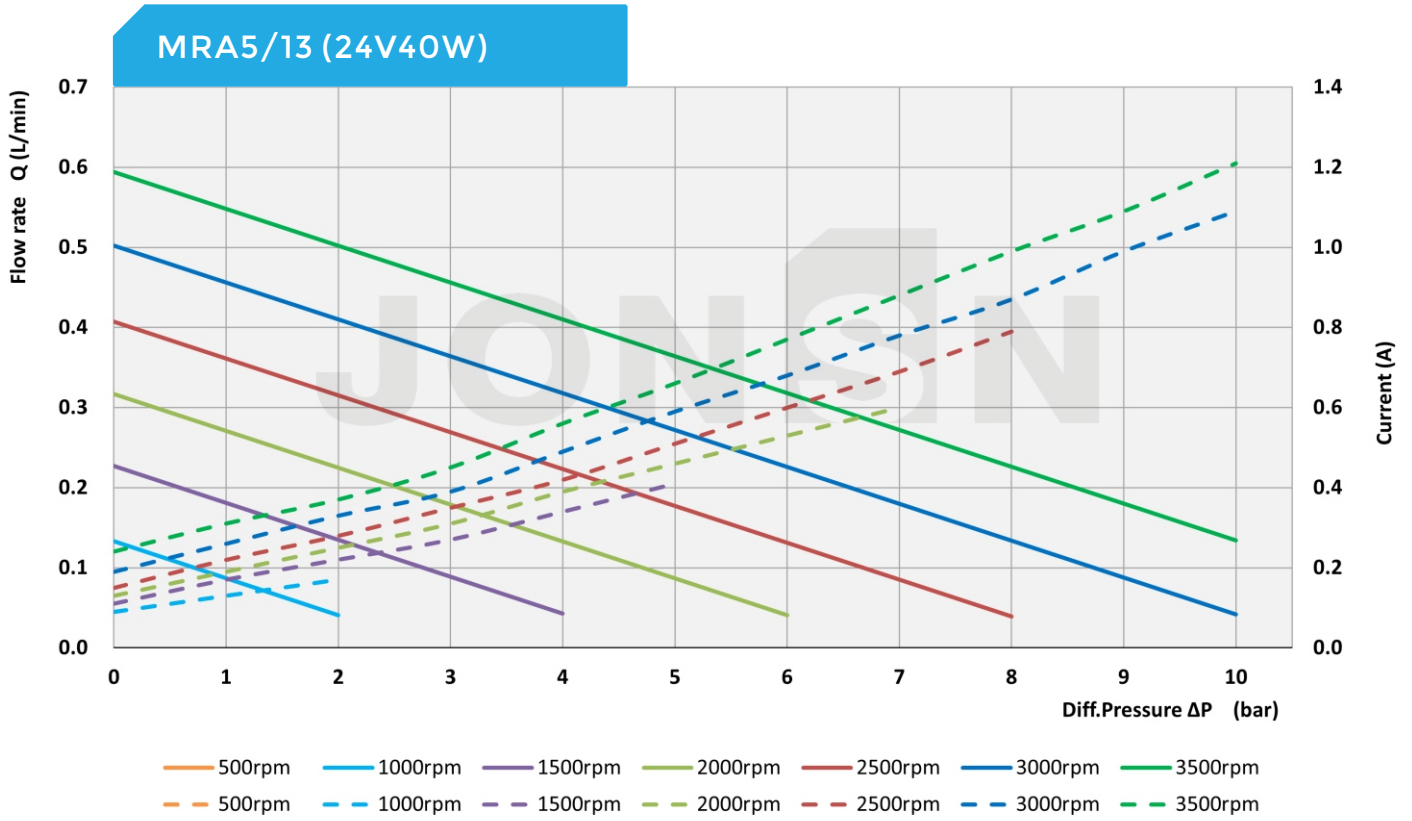
MPG | MRA | MRB | MRC | MRE | MRF | MGA

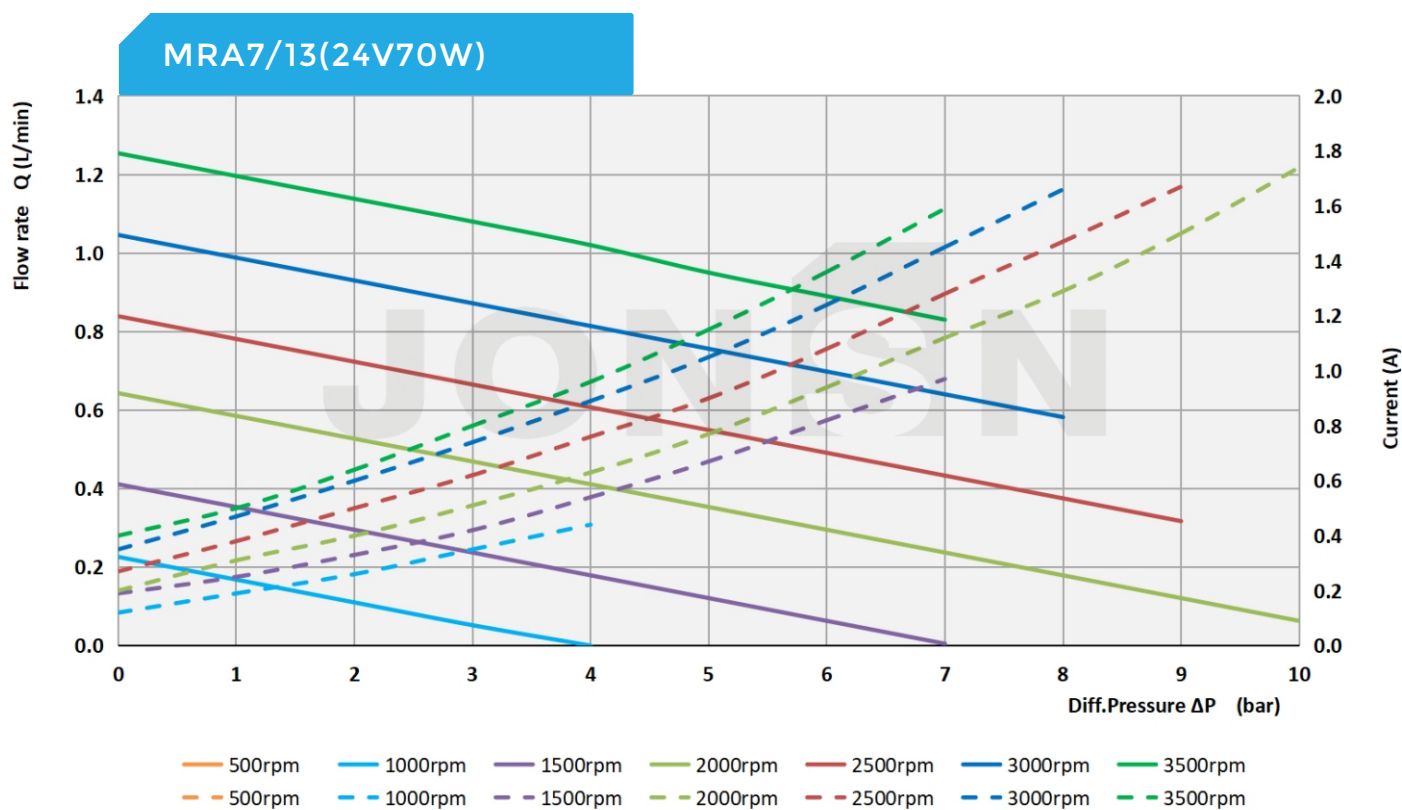
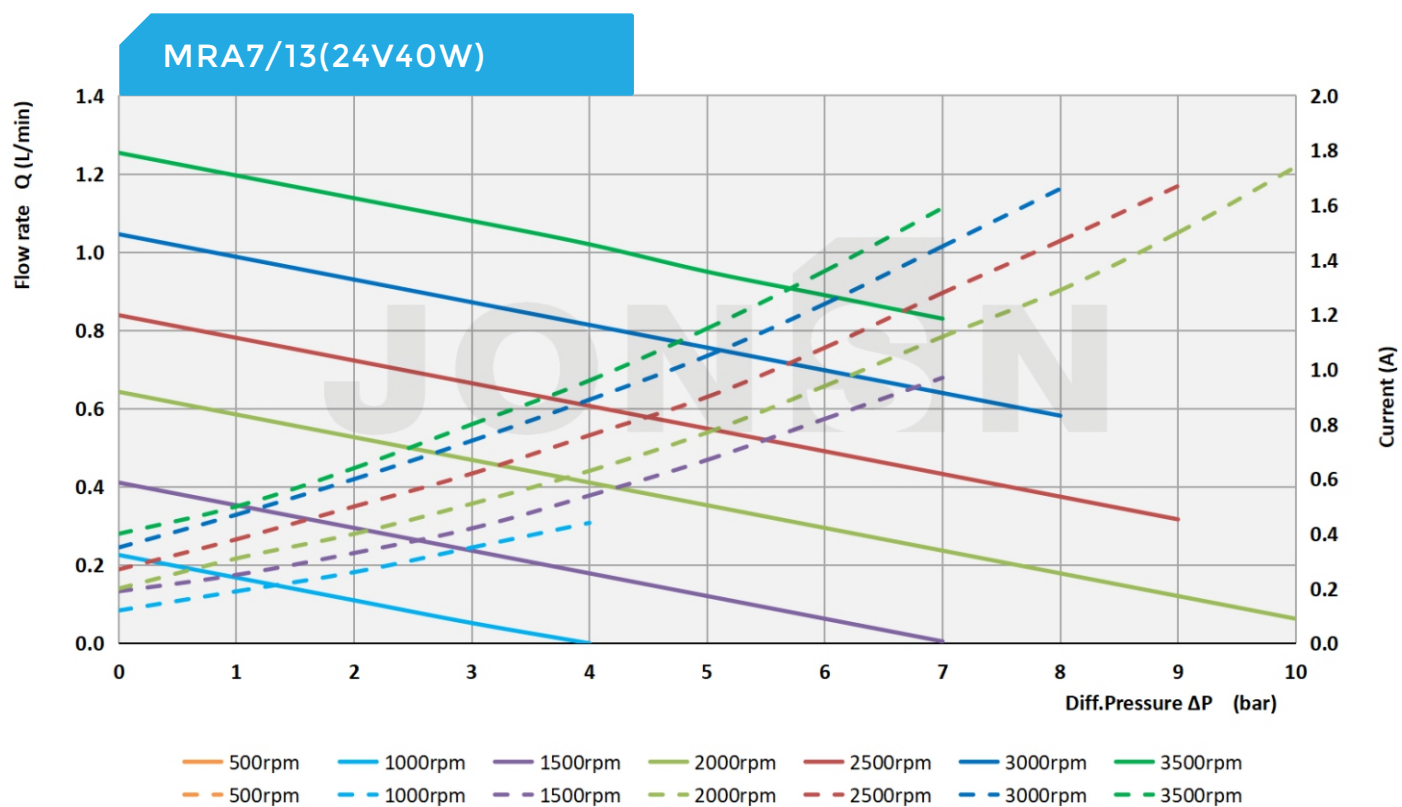
Pump Model	BLDC	
MRA5/13	40w/70w BLDC	Unified Dimensions
MRA7/13		
MRA10/13		
MRA12/13		



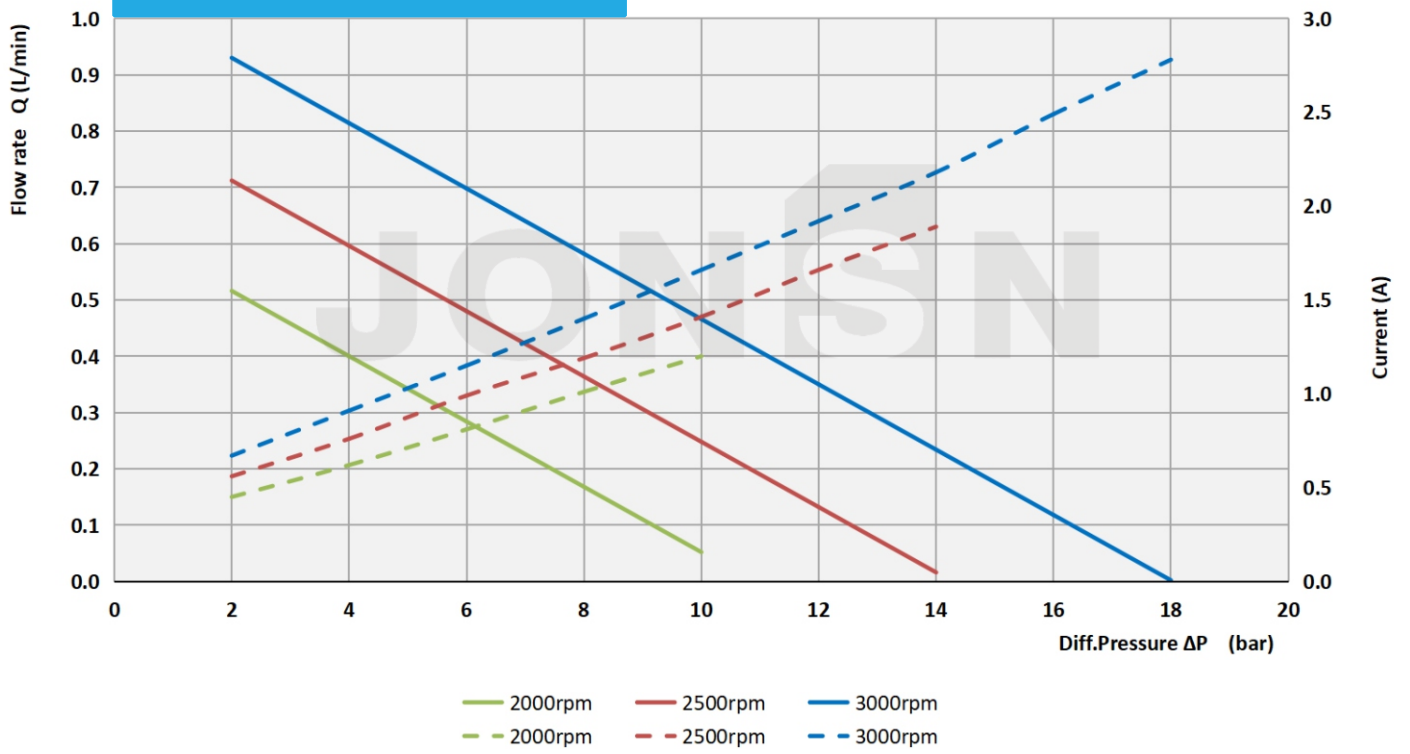
Pump Model	BLDC	
MRA5/13	100w BLDC	Unified Dimensions
MRA7/13		
MRA10/13		
MRA12/13		

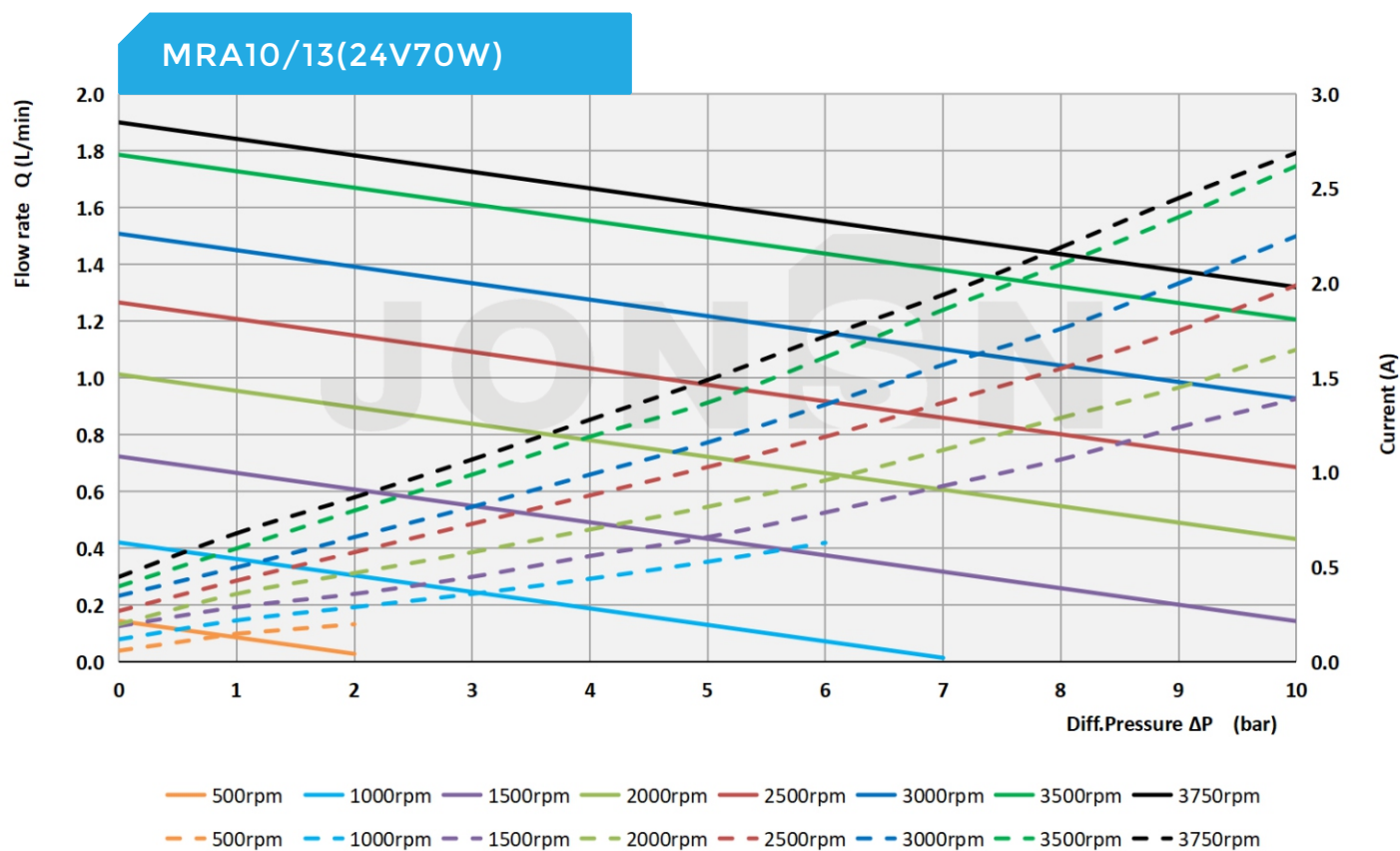
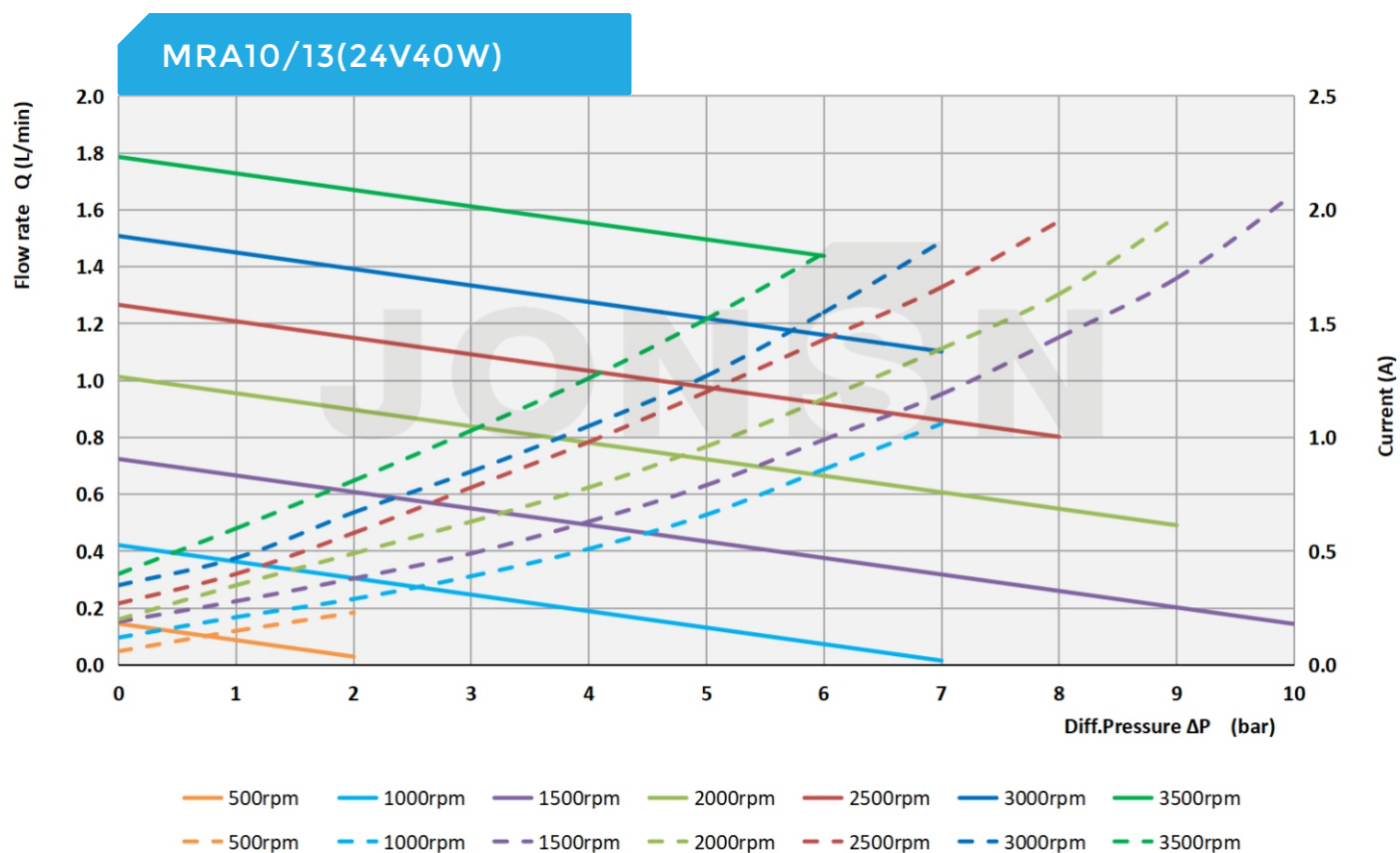


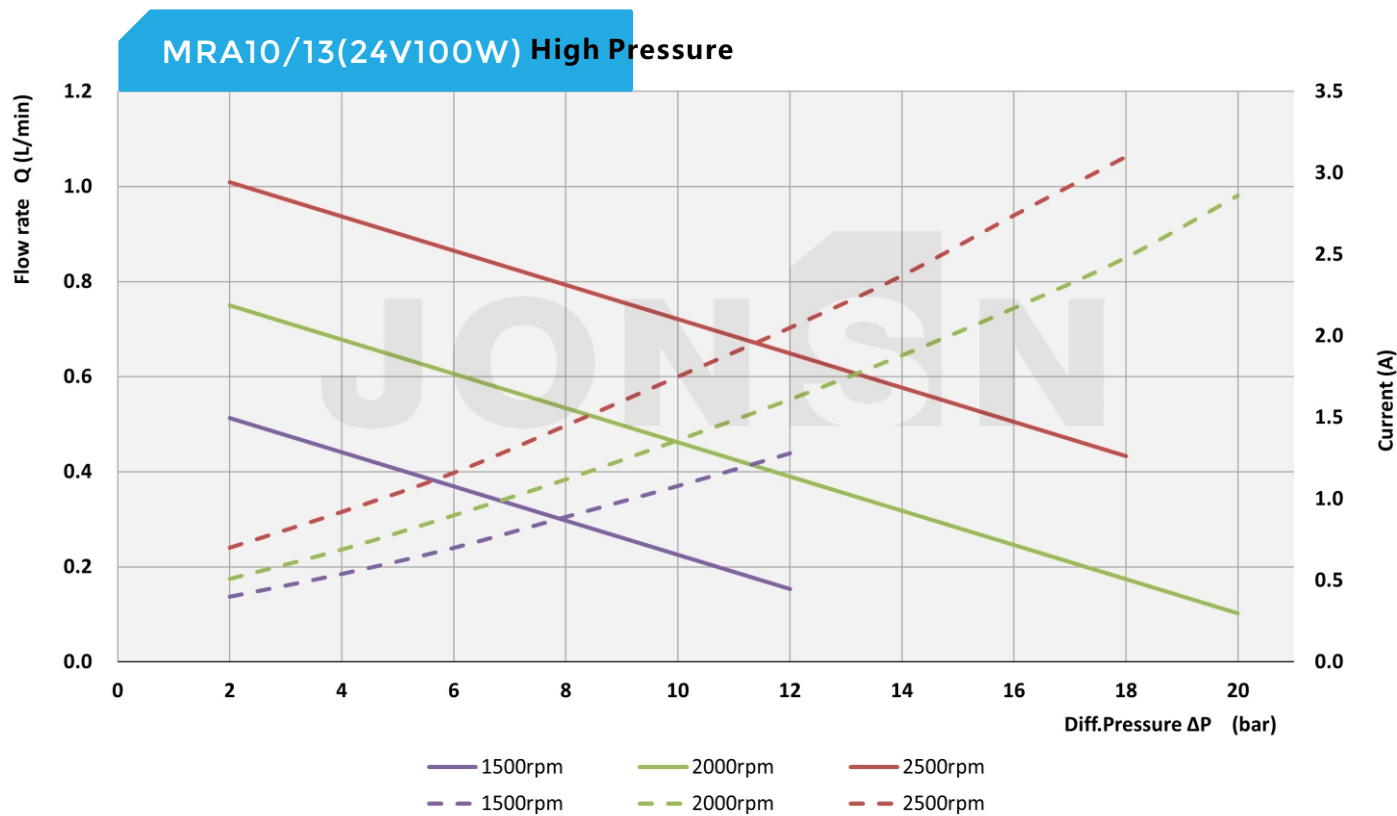
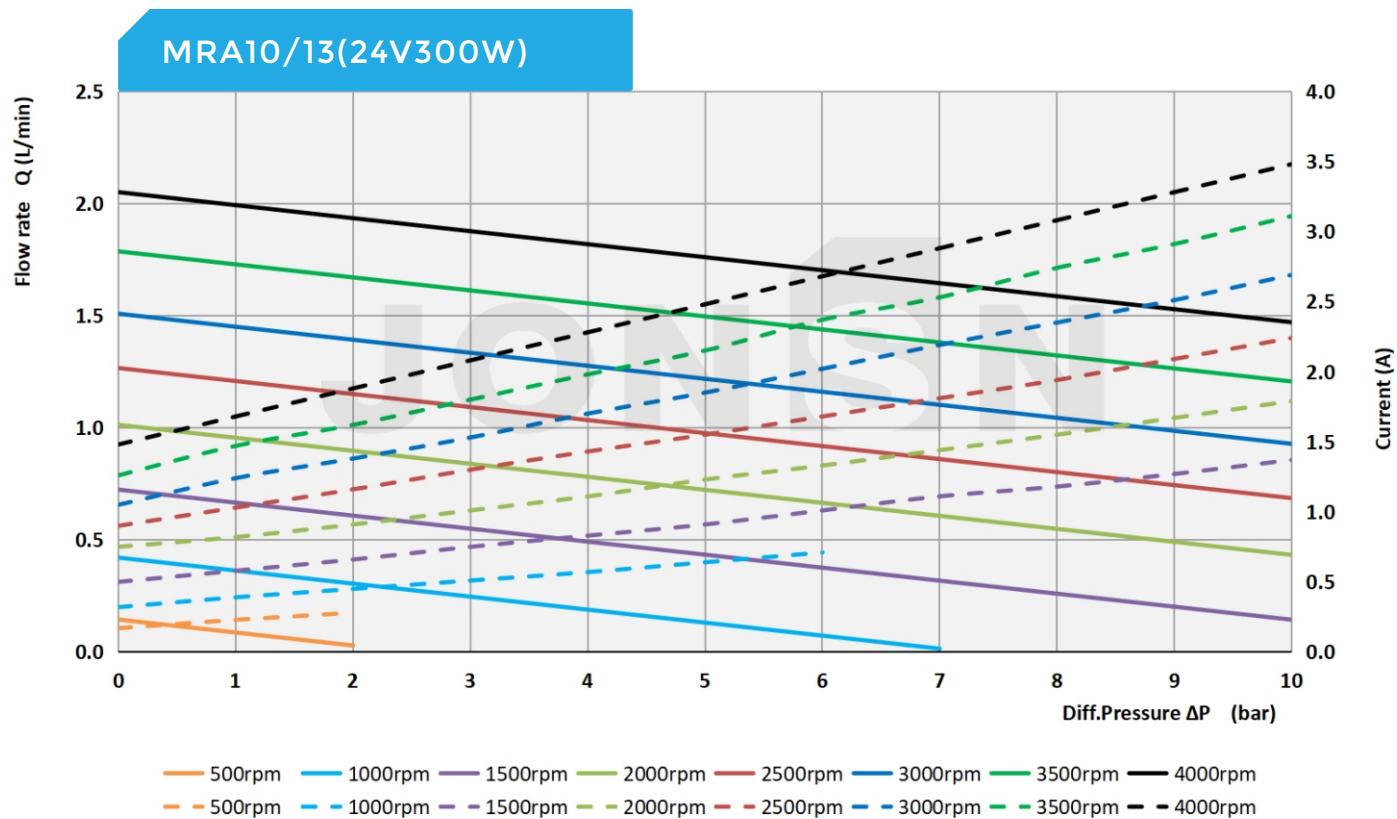


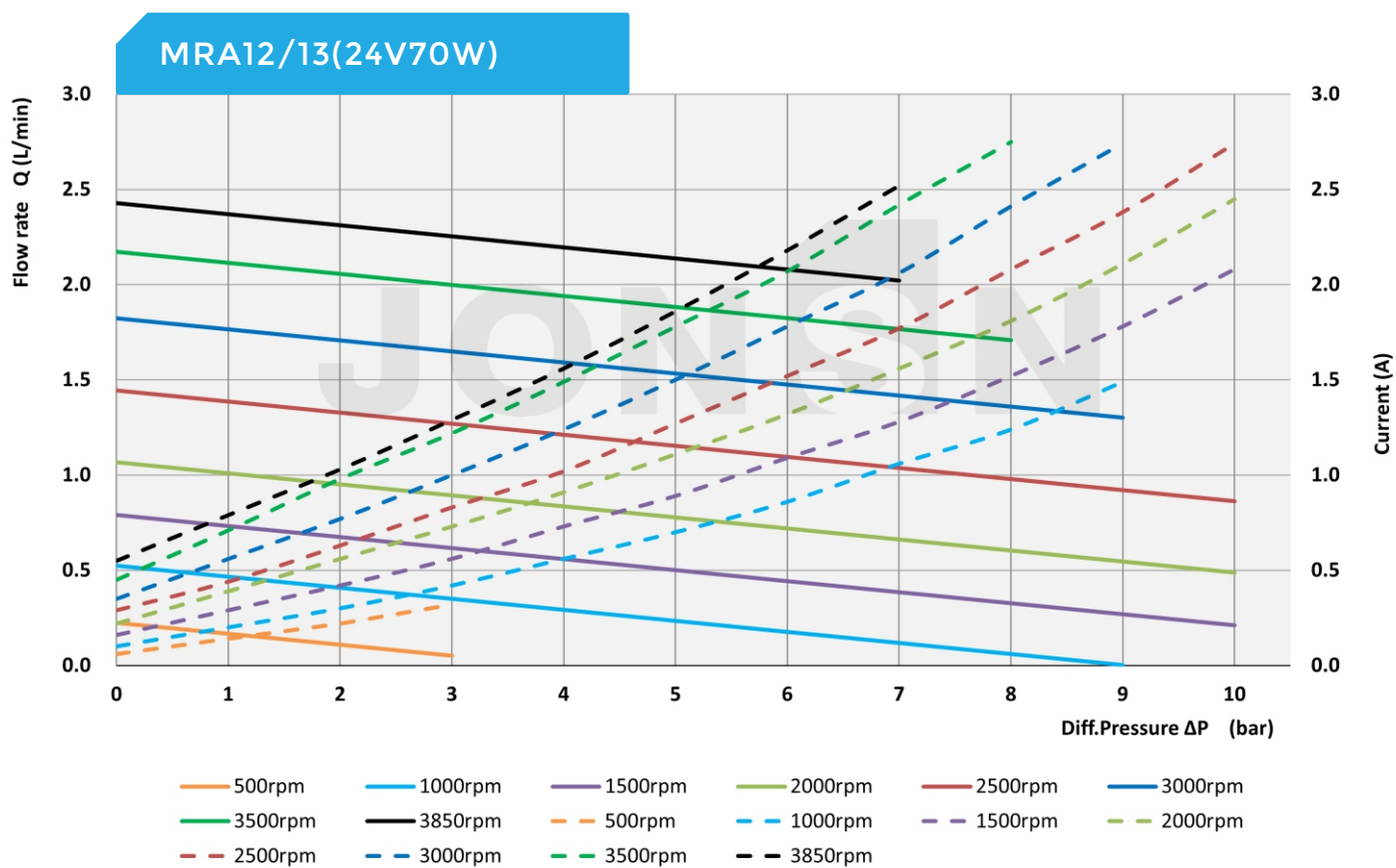
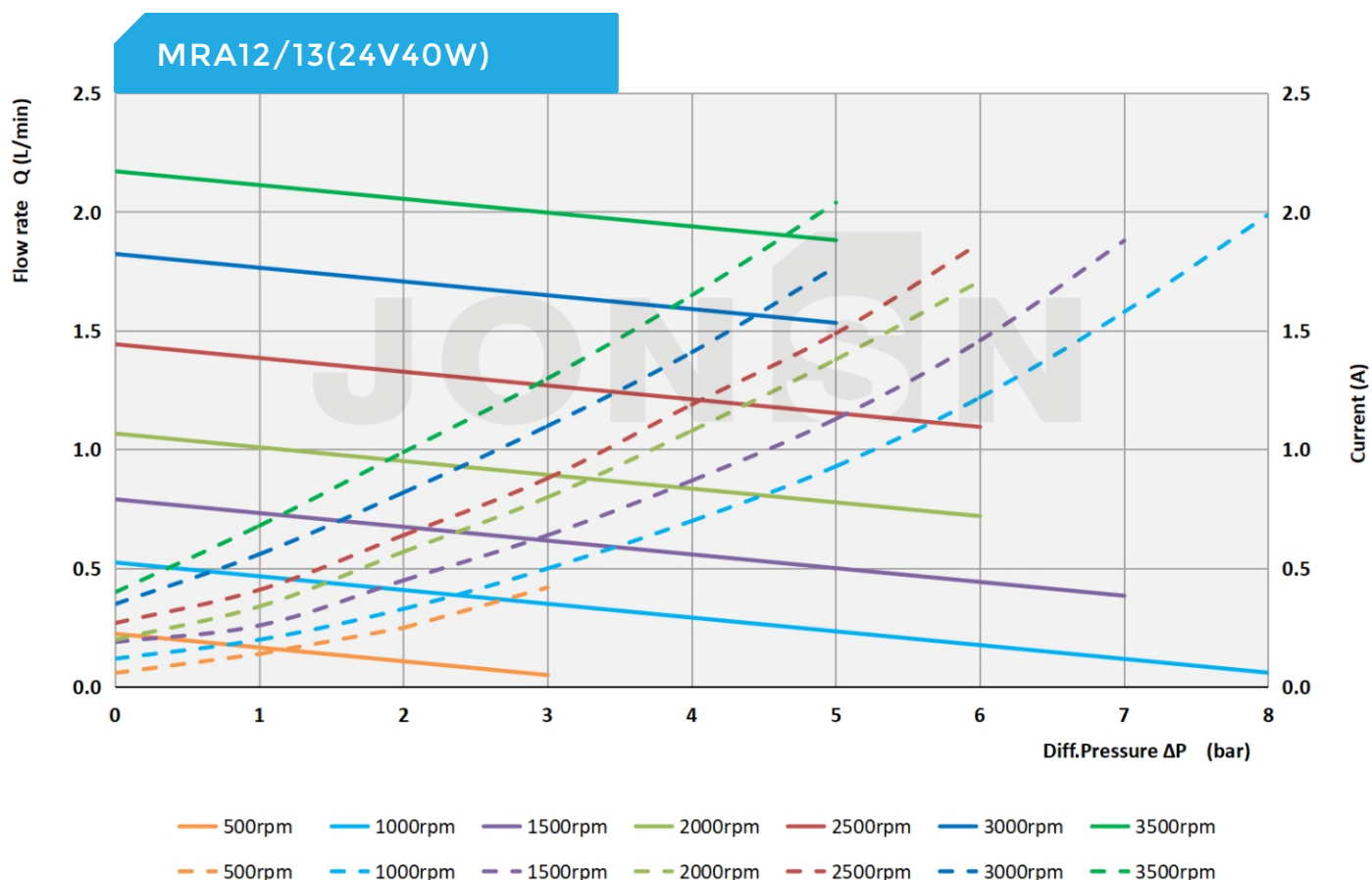


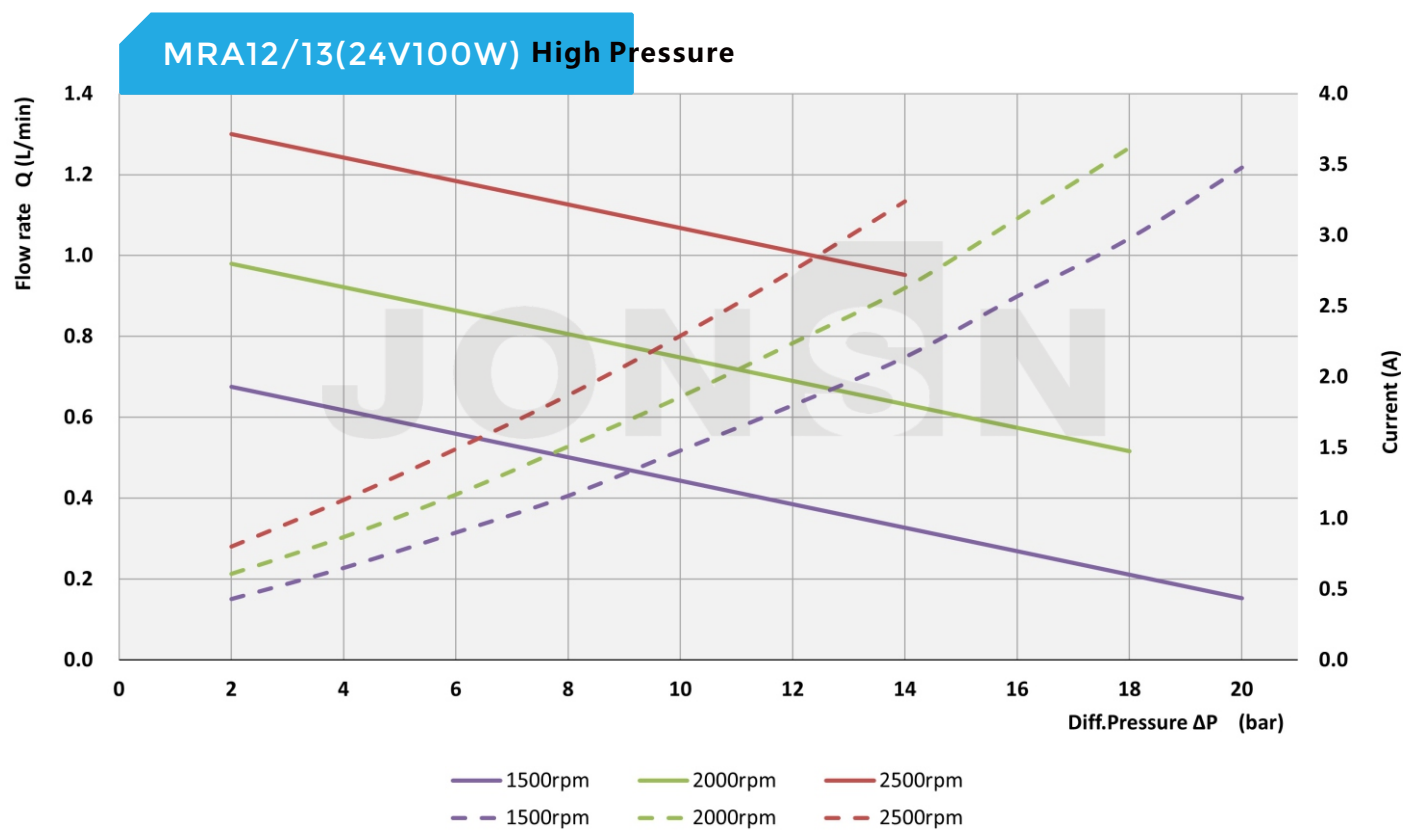
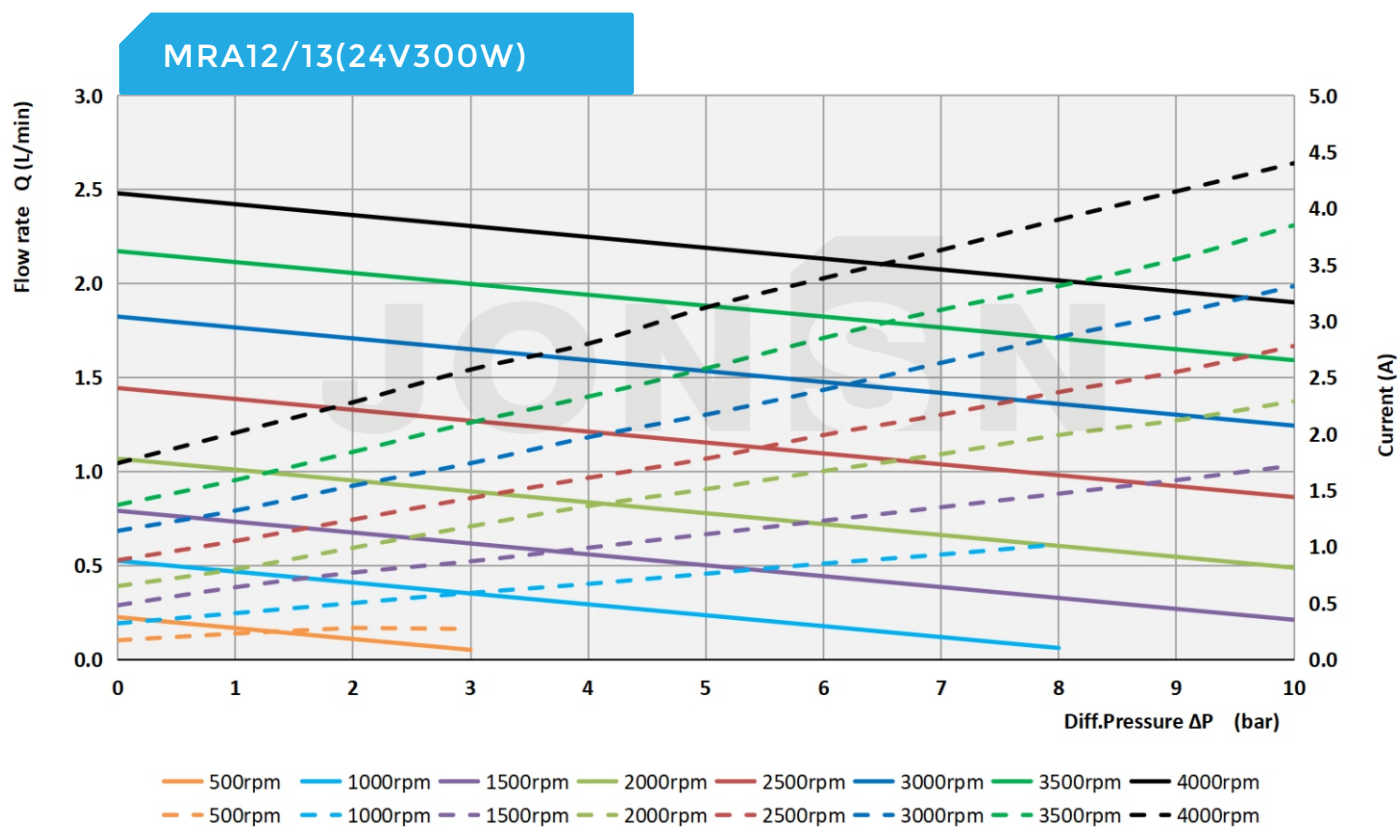
MRA7/13(24V100W) High Pressure











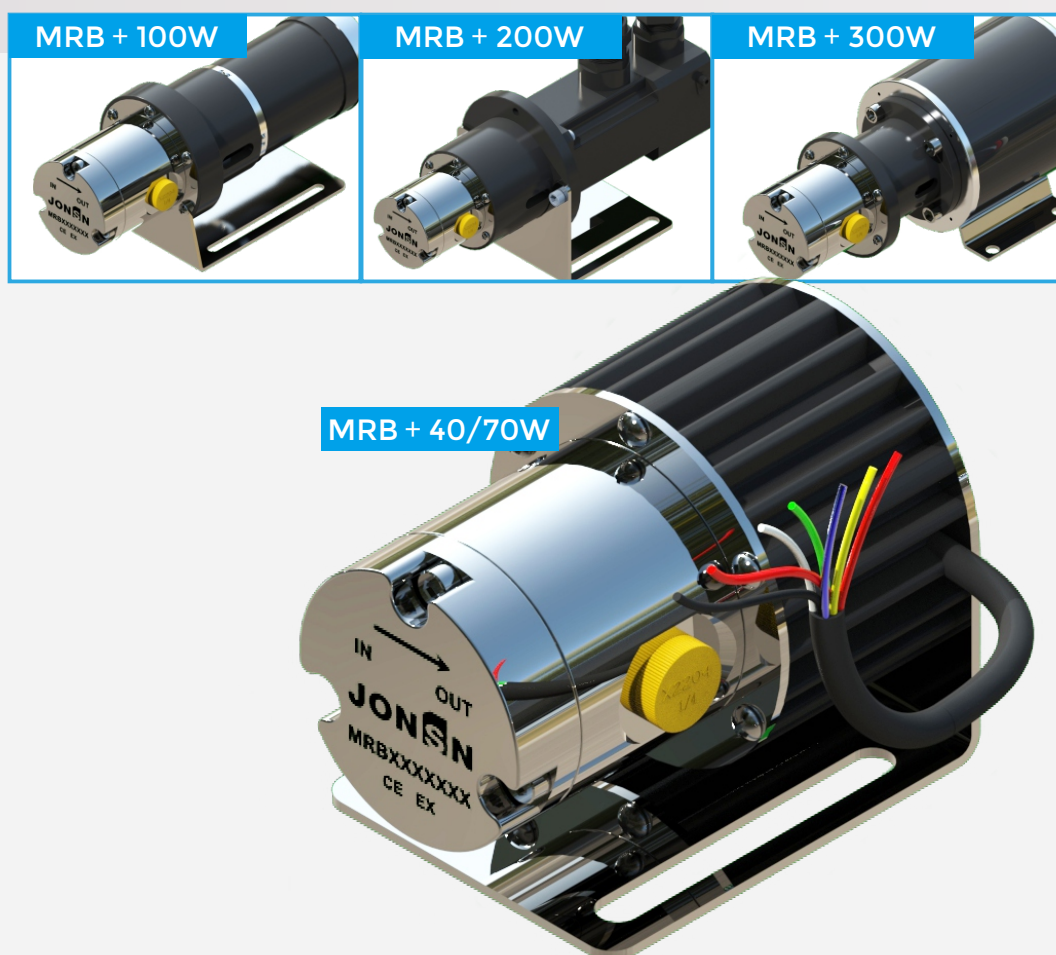
BLDC MOTORS

MRB + BLDC MOTORS

MRB Series Micro Gear Pump & 400ml-6000ml/min.

Capable of handling flow rates from 400ml to 6000ml/min, working pressure differentials from 0.5 to 25 bar, and viscosity range from 0.4 to 3000 mPa·s (approximately similar to water) under operating conditions, with a pump pressure resistance of 4 Mpa.

JONSN Precision-grade Micro Magnetic Gear Pump can be used for: micro-dosing, addition, lubrication, spraying, dispensing, sampling, inkjet printing, pressurization, circulation, coating, spraying, metering, and other pumping systems for liquids.

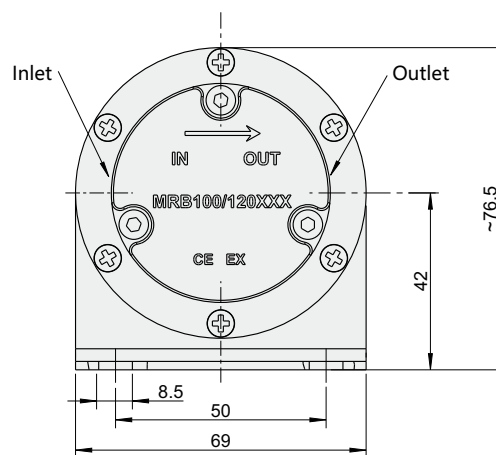
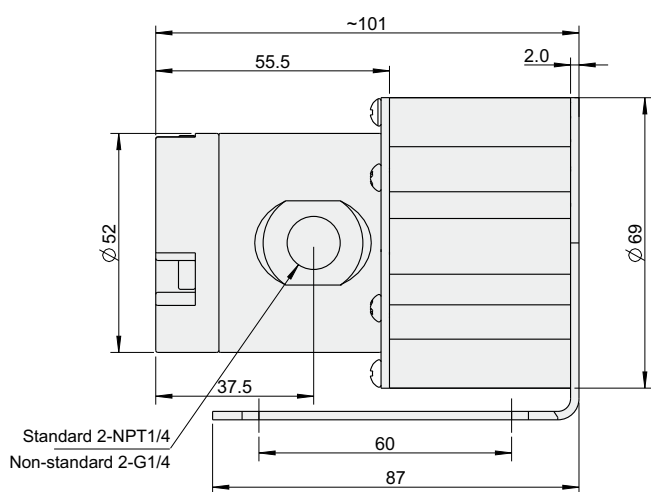


BLDC MOTORS

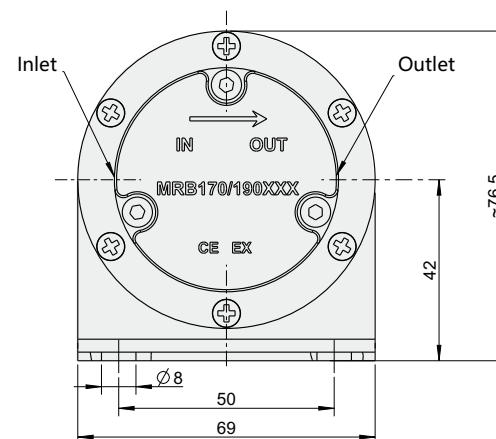
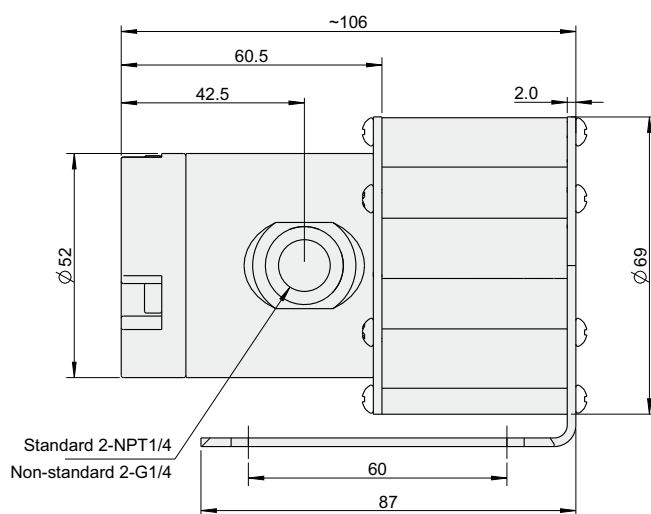
MRB + BLDC MOTORS

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Pump Model	BLDC MOTORS	
MRB10/16	40w/70w BLDC	Unified Dimensions
MRB12/16		



Pump Model	BLDC MOTORS	
MRB17/16	40w/70w BLDC	Unified Dimensions
MRB19/16		

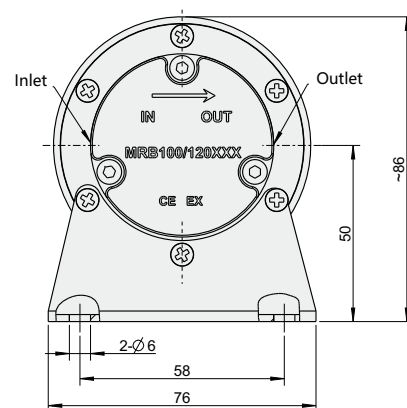
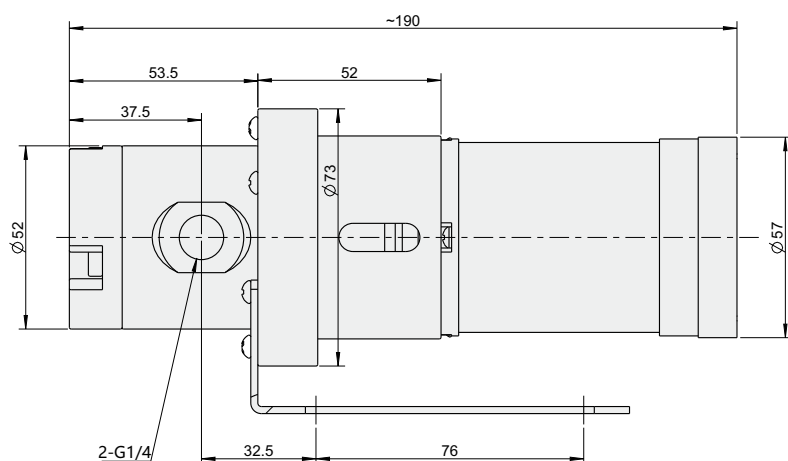


BLDC MOTORS

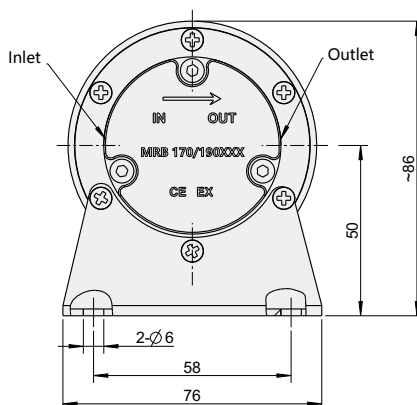
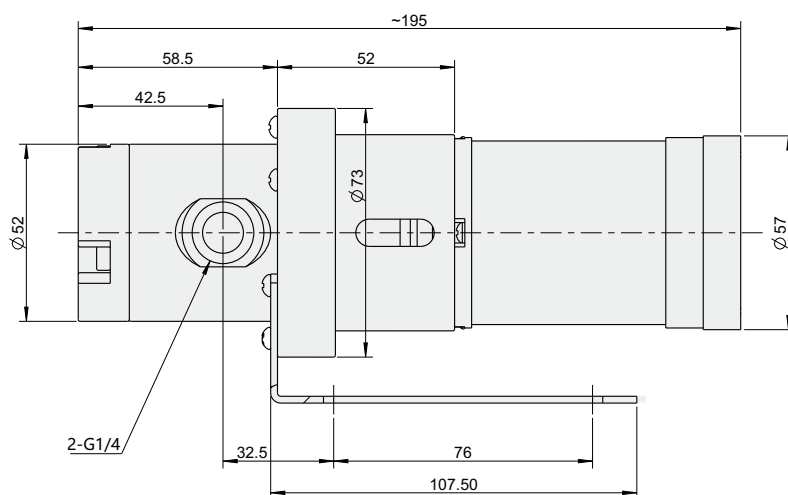
MRB + BLDC MOTORS

24

Pump Model	BLDC MOTORS	
MRB10/16	100w BLDC	Unified Dimensions
MRB12/16		



Pump Model	BLDC MOTORS	
MRB17/16	100w BLDC	Unified Dimensions
MRB19/16		

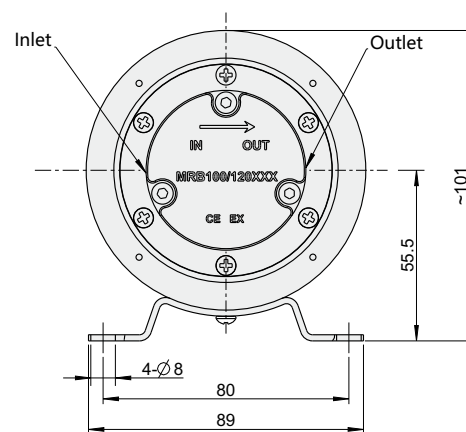
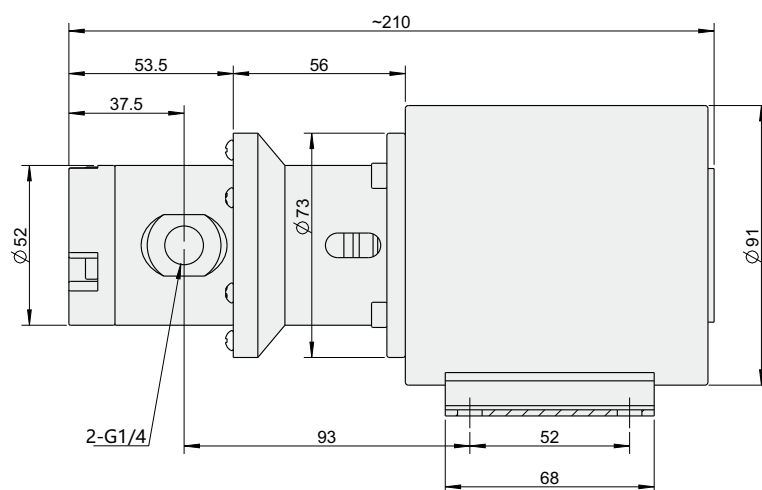


BLDC MOTORS

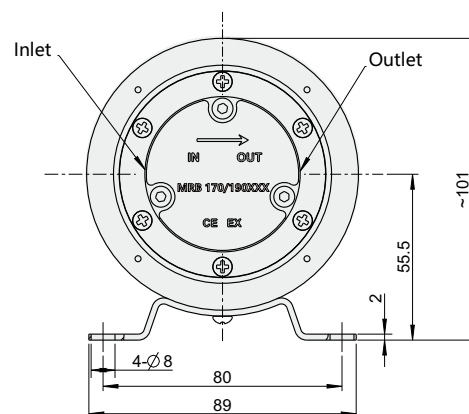
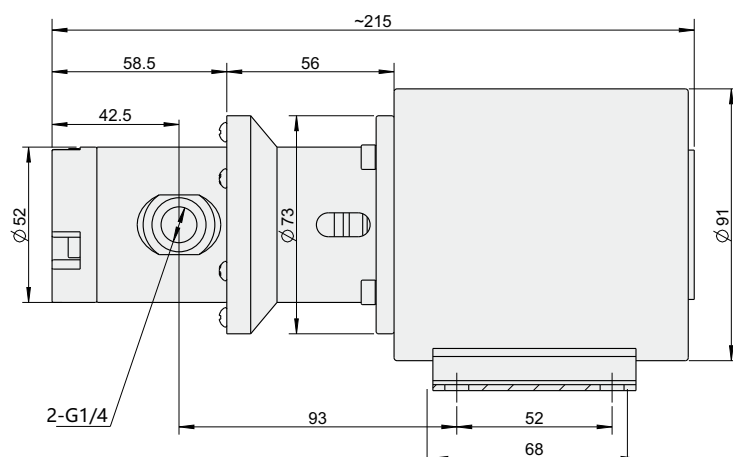
MRB + DC brushless moto

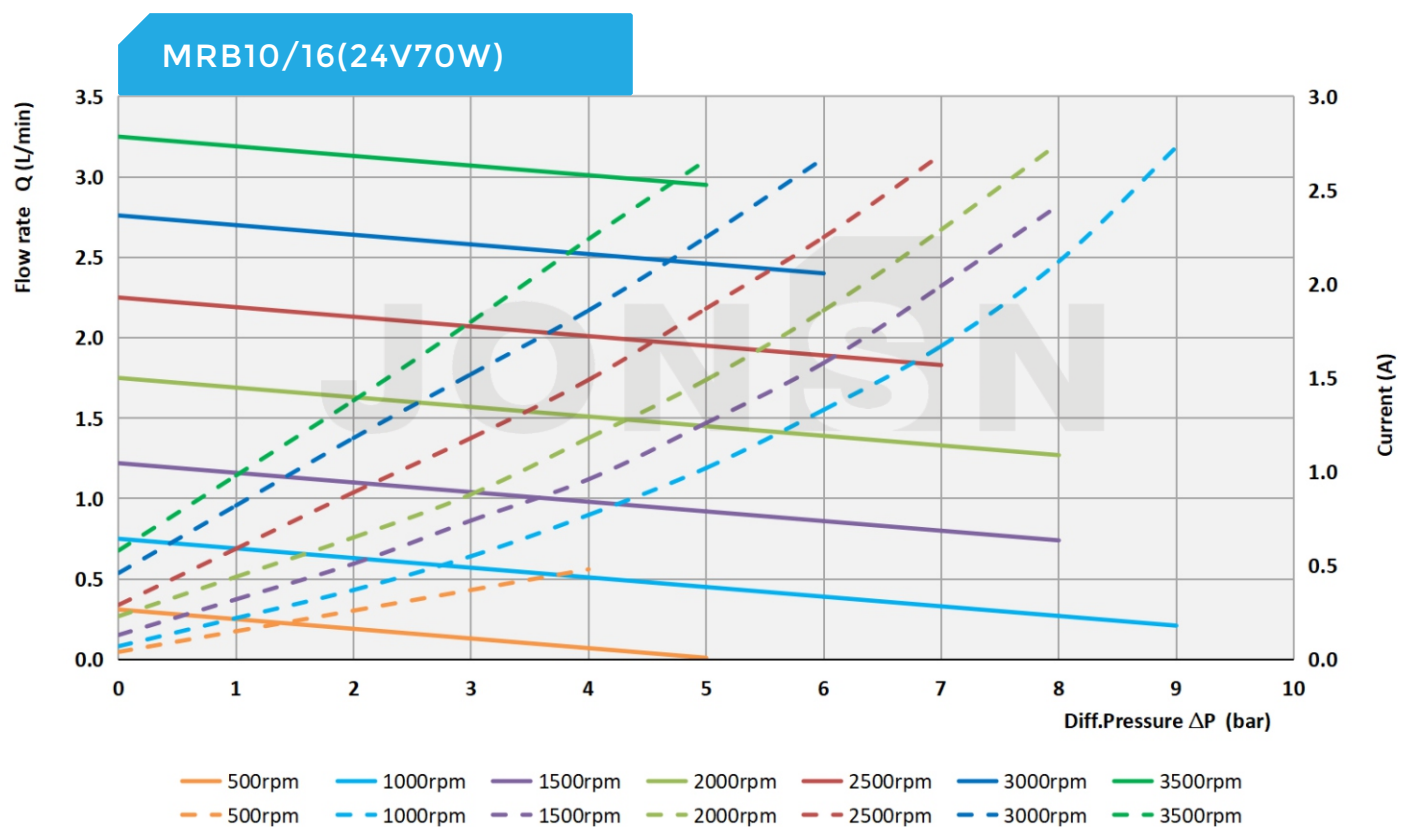
25

Pump Model	BLDC MOTORS	
MRB10/16	200w/300w BLDC	Unified Dimensions
MRB12/16		

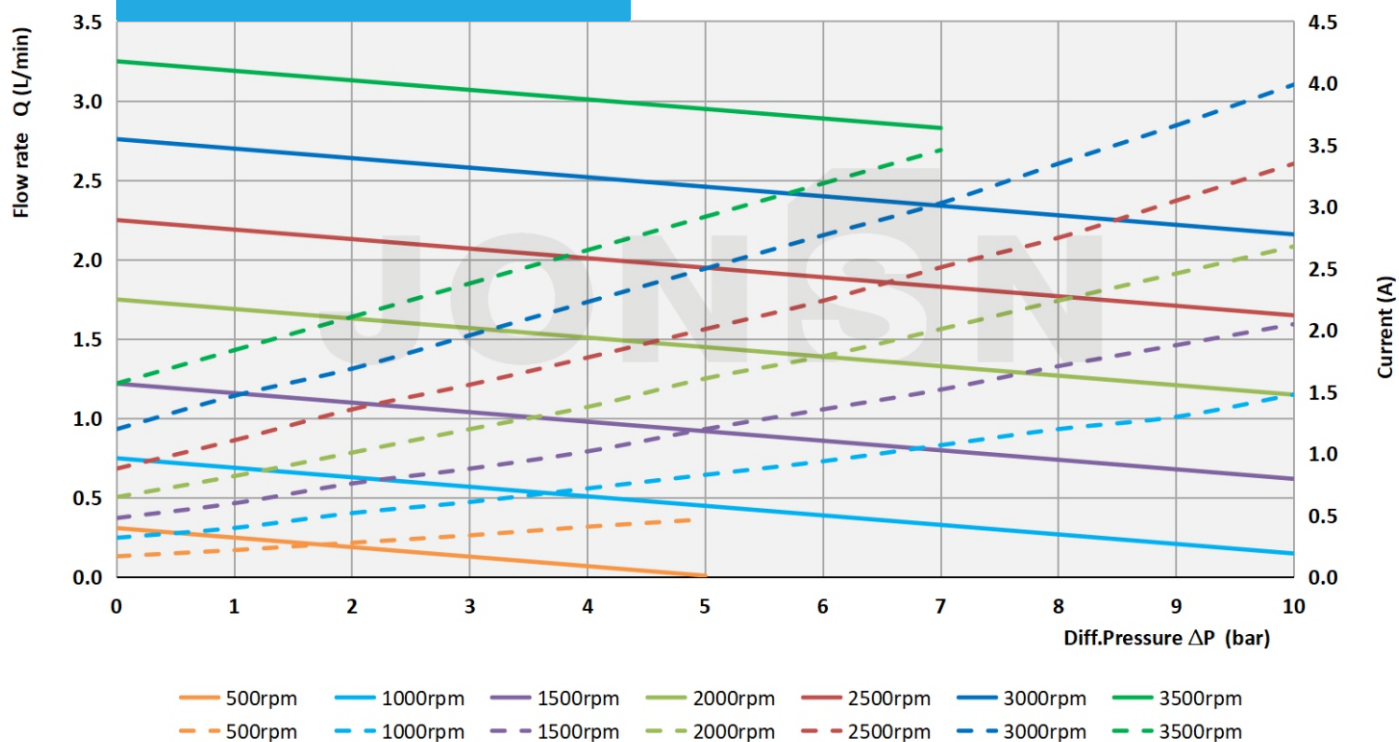


Pump Model	BLDC MOTORS	
MRB17/16	200w/300w BLDC	Unified Dimensions
MRB19/16		

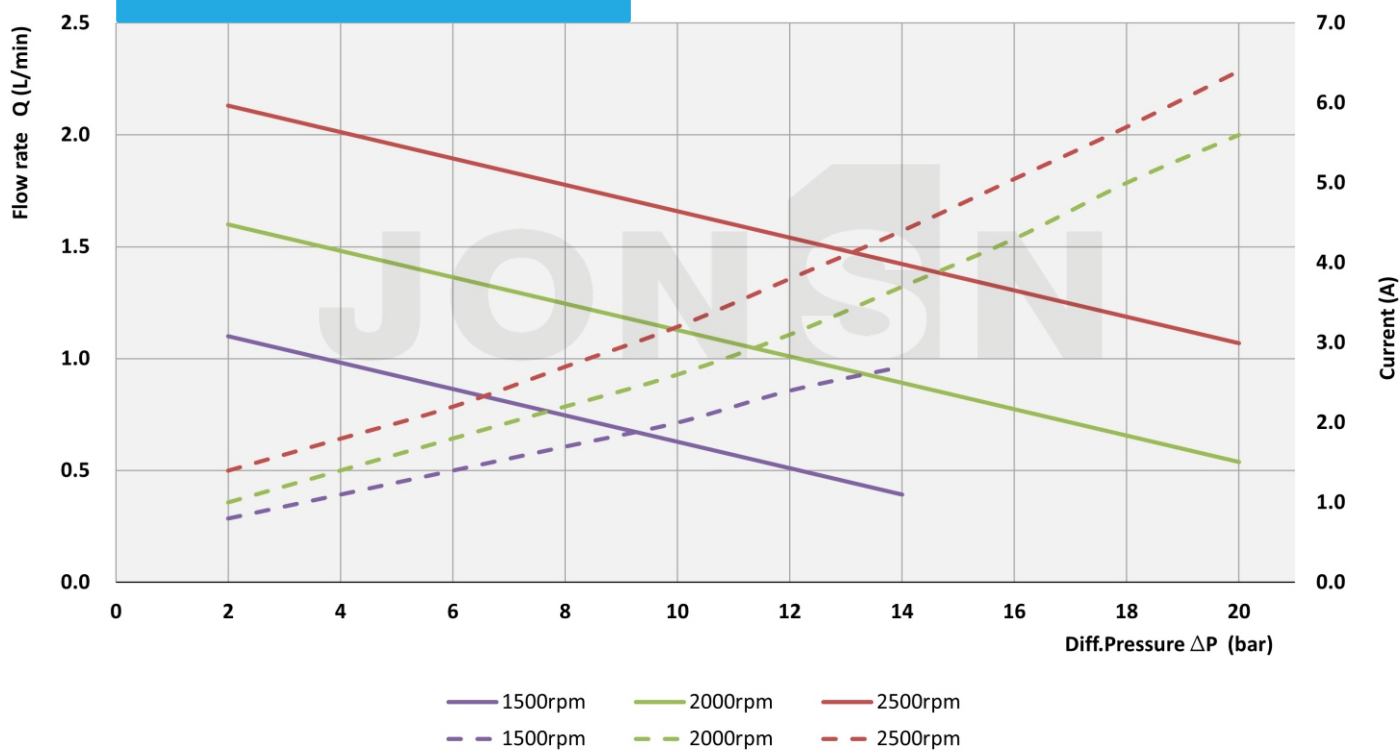


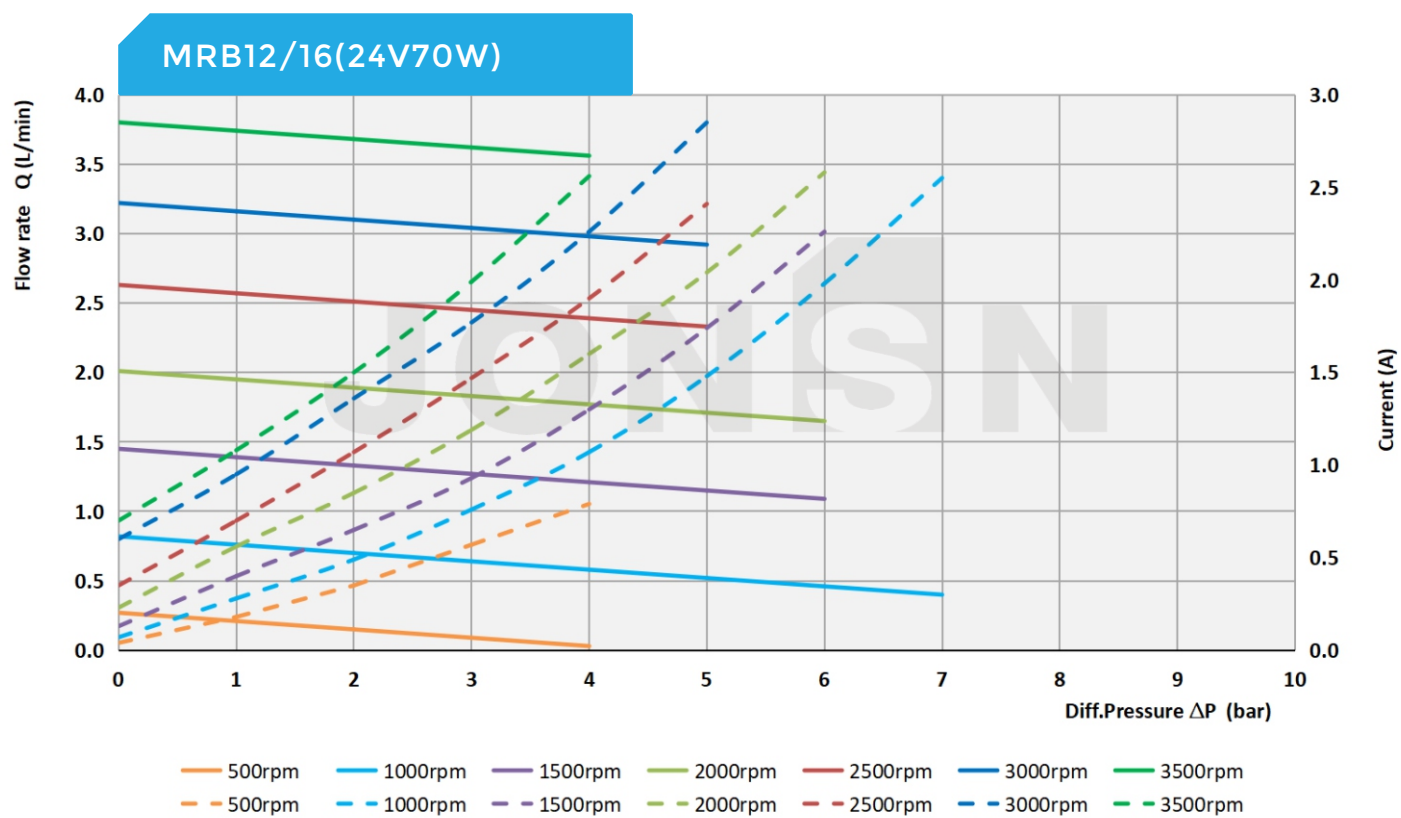


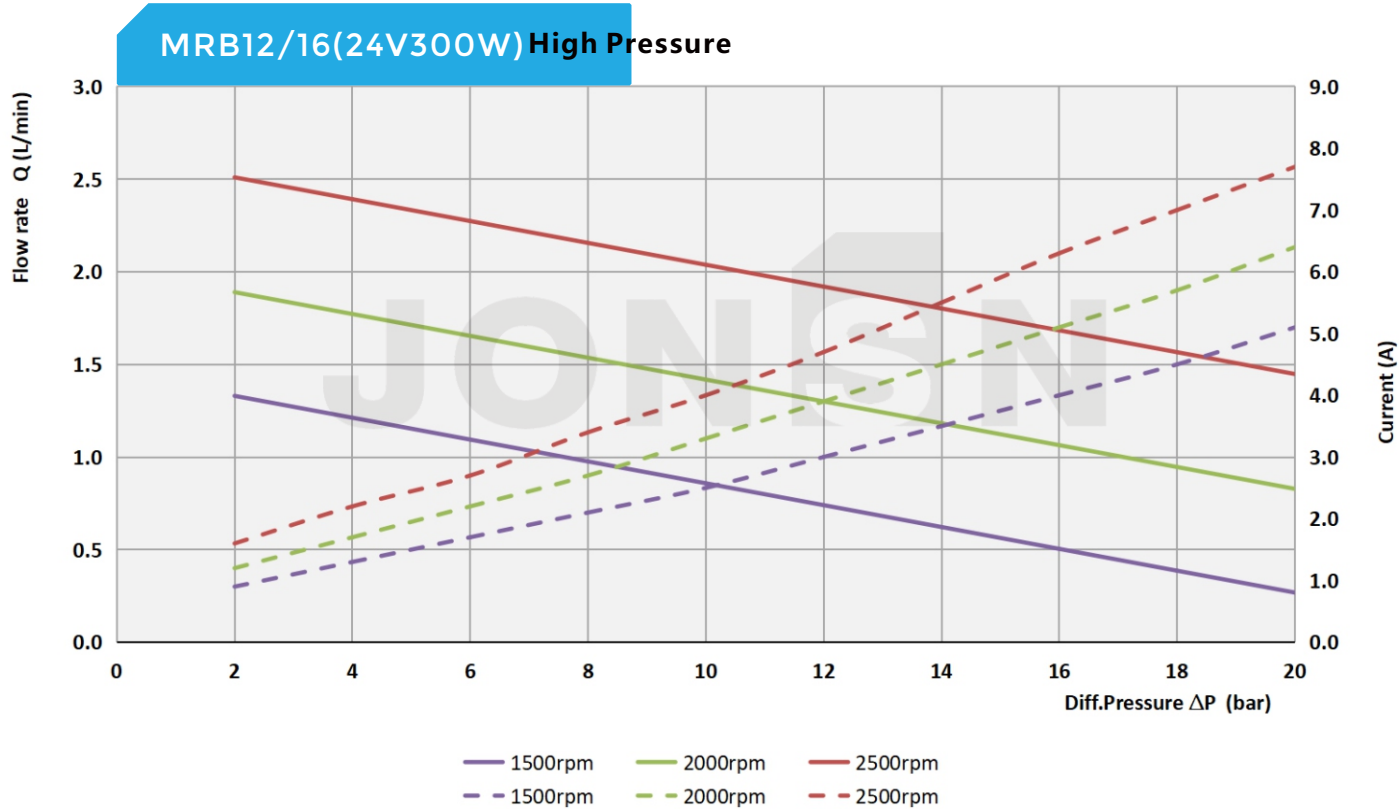
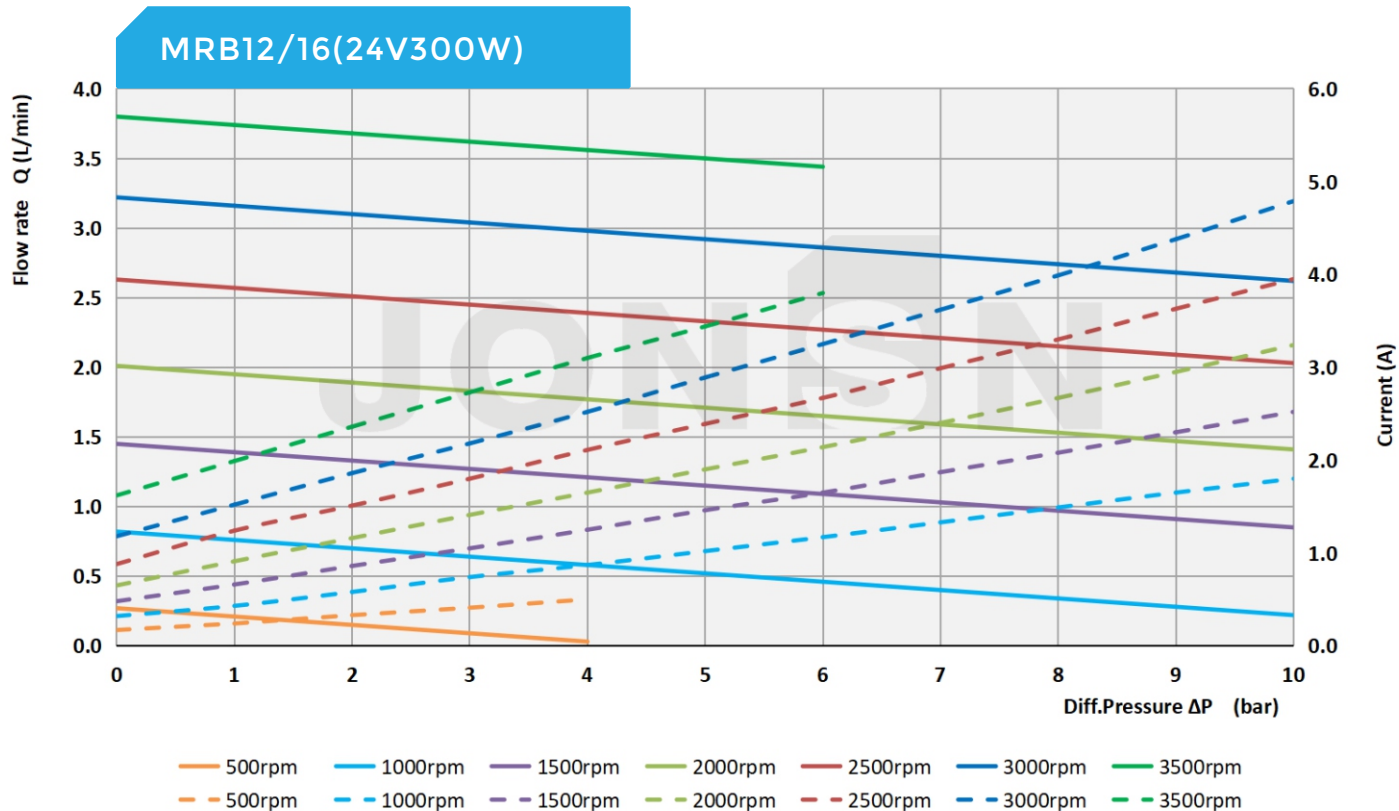
MRB10/16(24V300W)

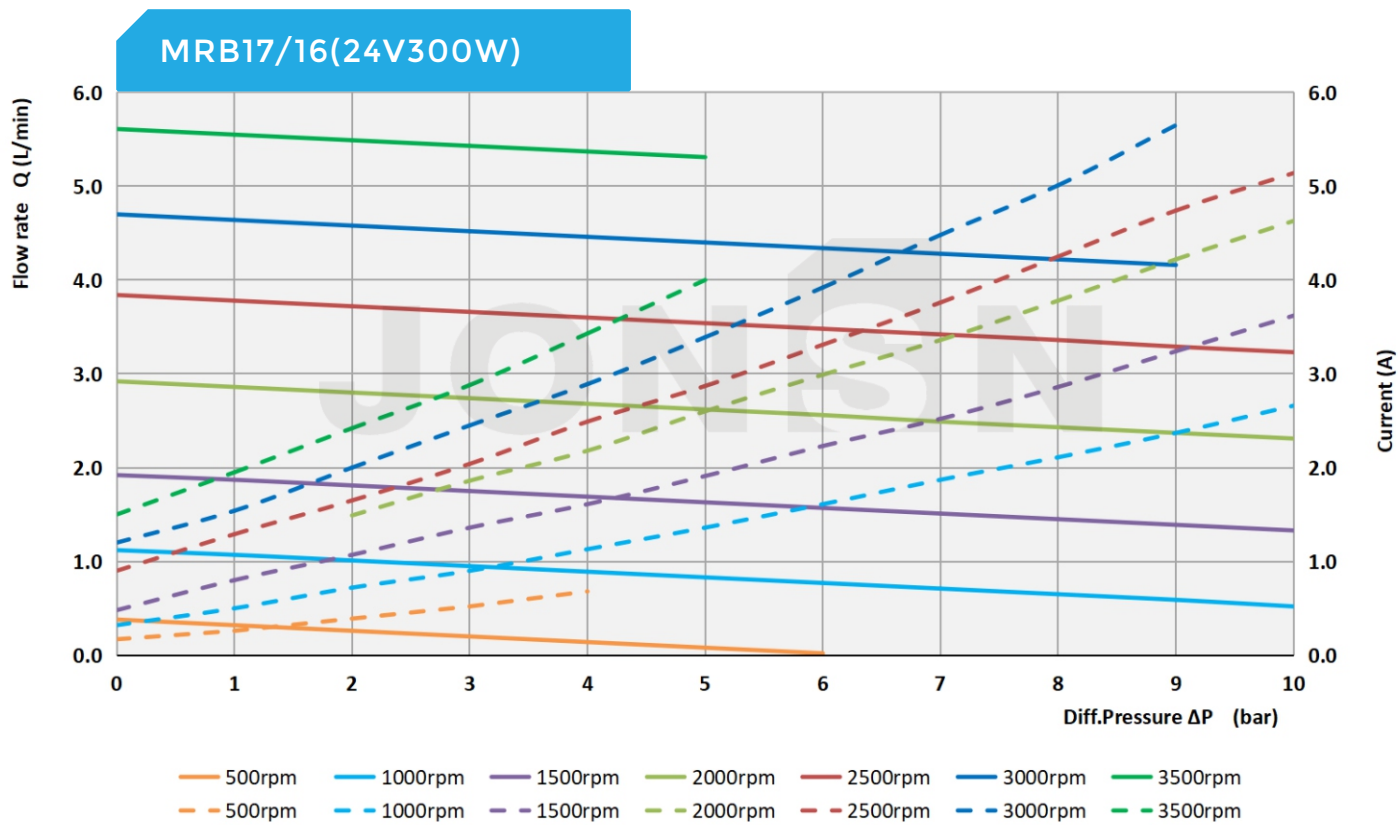
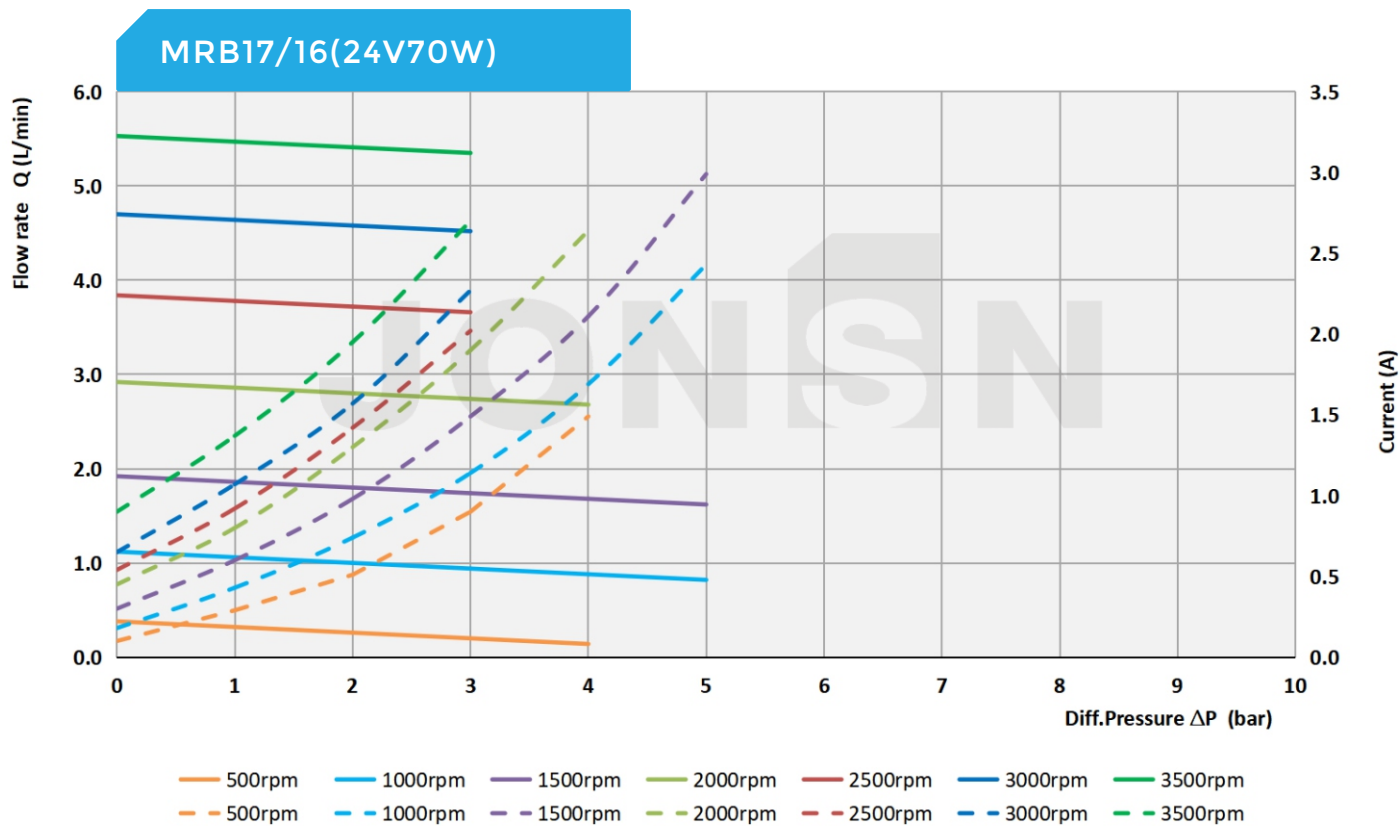


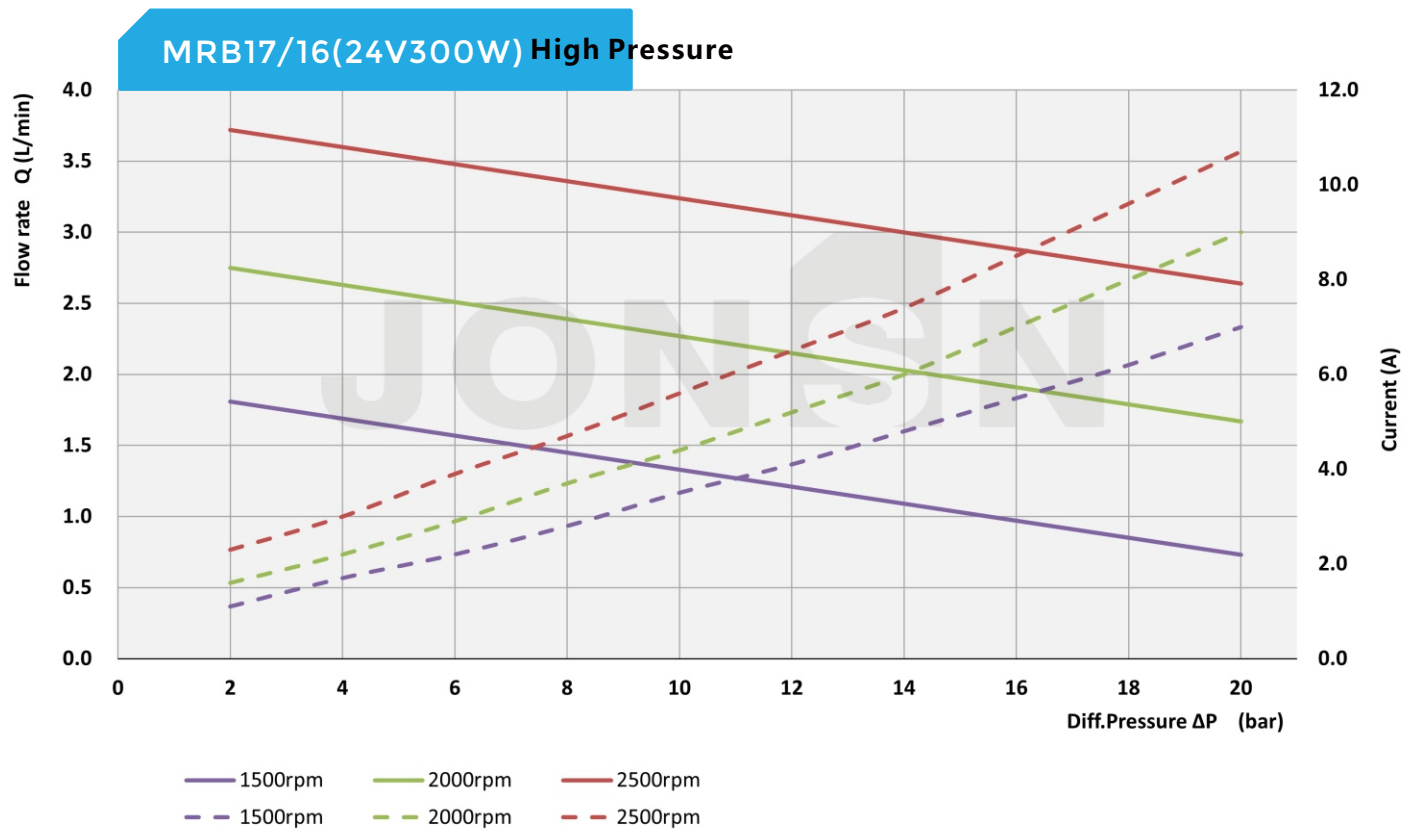
MRB10/16(24V300W)High Pressure



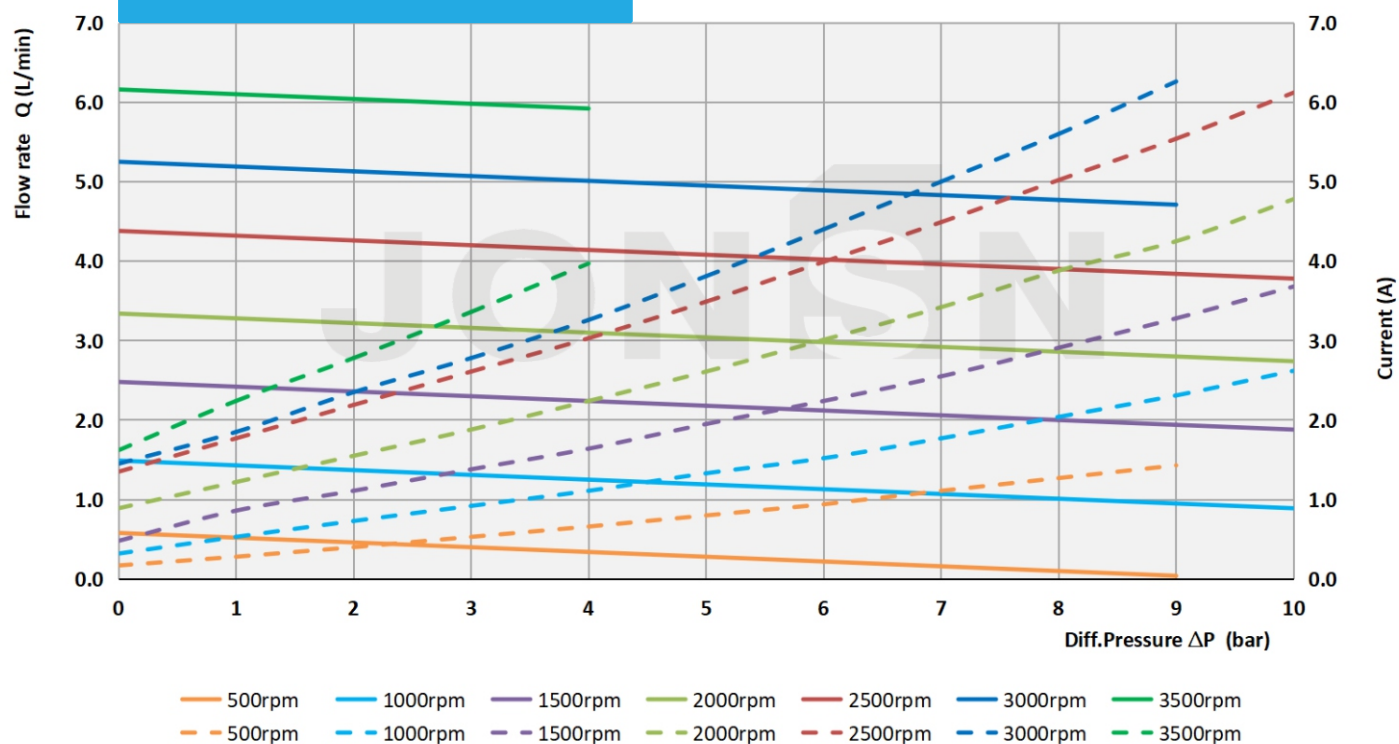




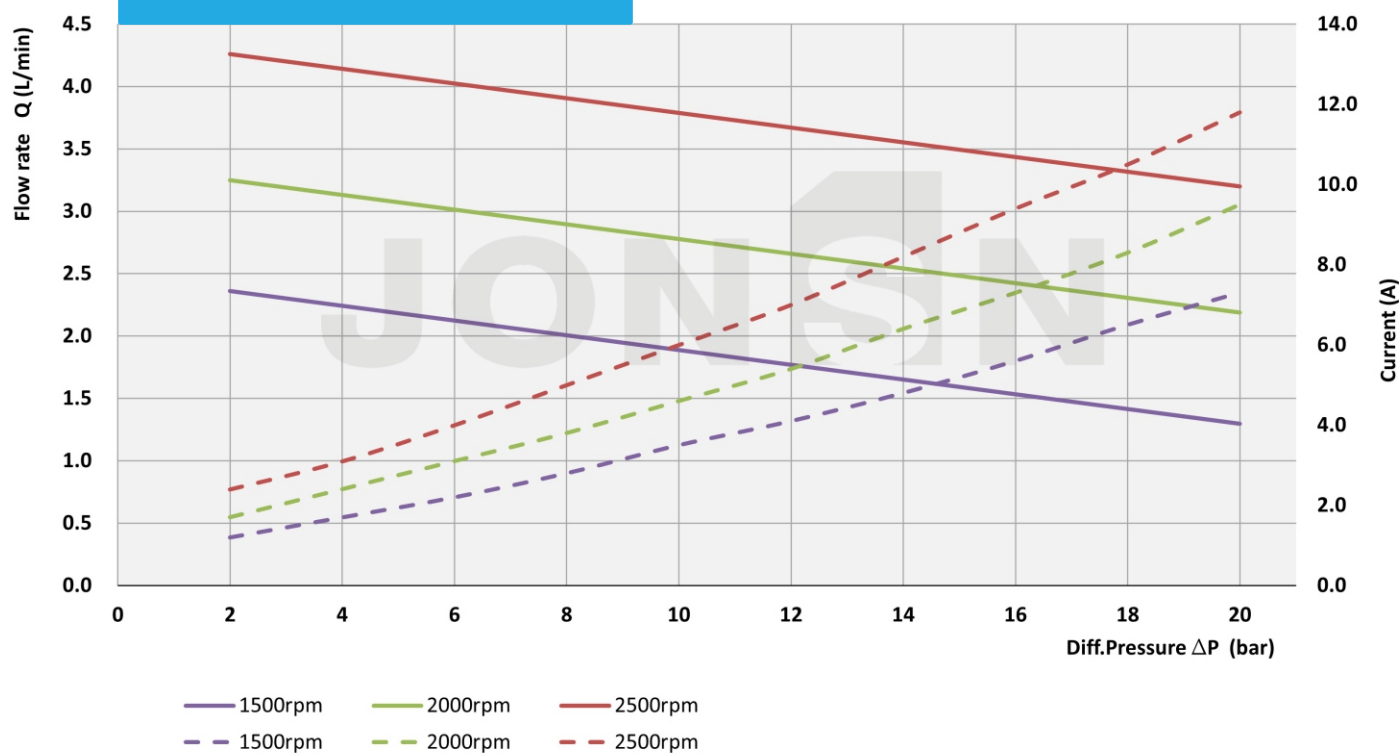




MRB19/16(24V300W)



MRB19/16(24V300W) High Pressure



BLDC MOTORS

MRC + DC brushless motor

33

MRC Series Micro Gear Pump

Flow rate: 0.8–18 L/min Working differential

pressure: 0.5–25 bar

Applicable viscosity: 0.4–3000 mPa·s (similar to water)

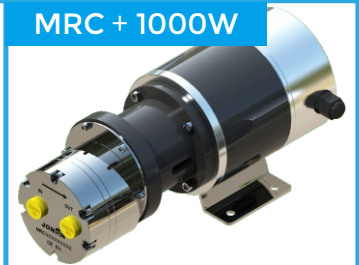
Pump pressure resistance: 6 MPa

JONSN precision micro magnetic gear pumps are suitable for conveying: deionized water, methanol, urea solution, kerosene, additives, auxiliaries, lubricating oil, lye, ammonia liquid, cobalt liquid, dialysate, ethylene glycol, freon, ink, glycerol, phenolic resin, curing agent, flavors and fragrances, fluorinated liquid in pumping systems.

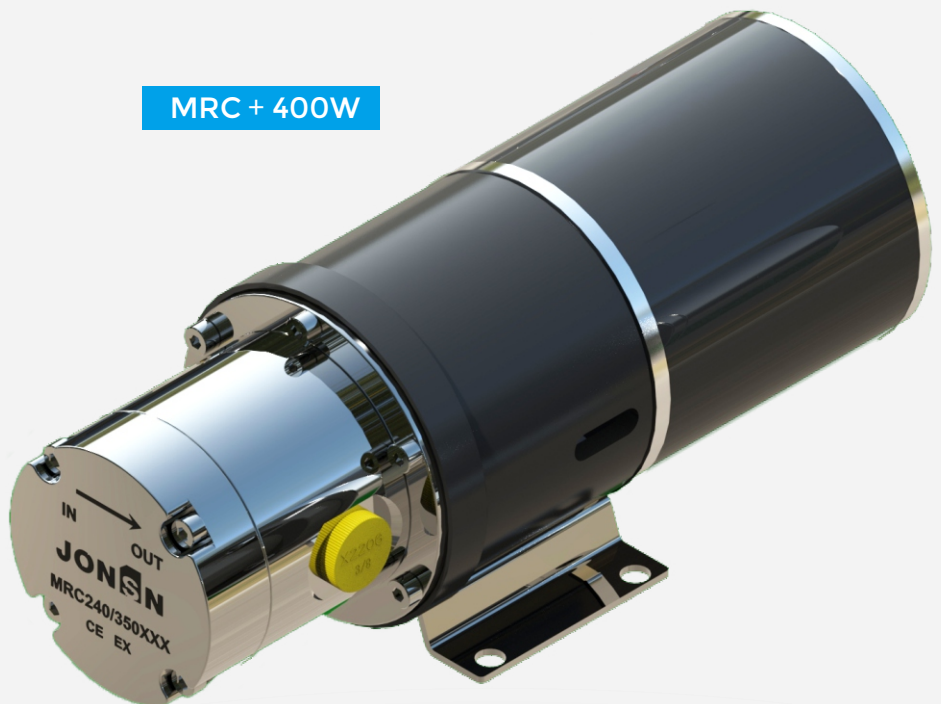
MRC + 600W



MRC + 1000W



MRC + 400W



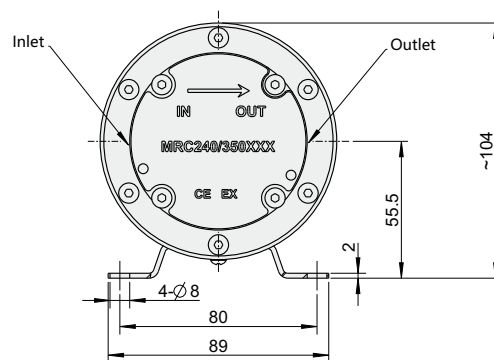
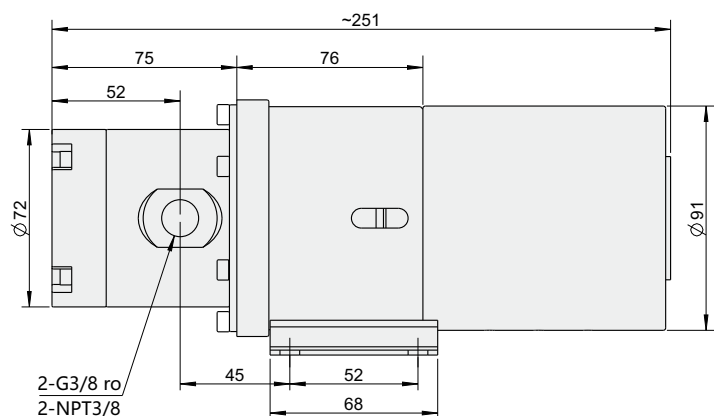
BLDC MOTORS

MRC + BLDC MOTORS

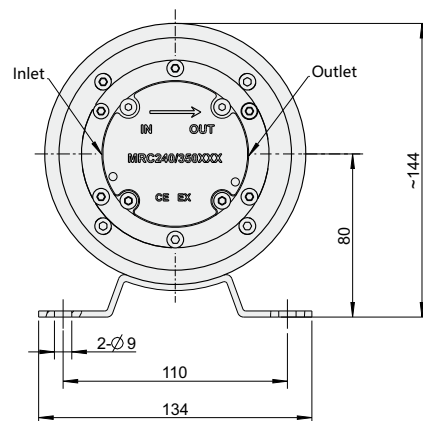
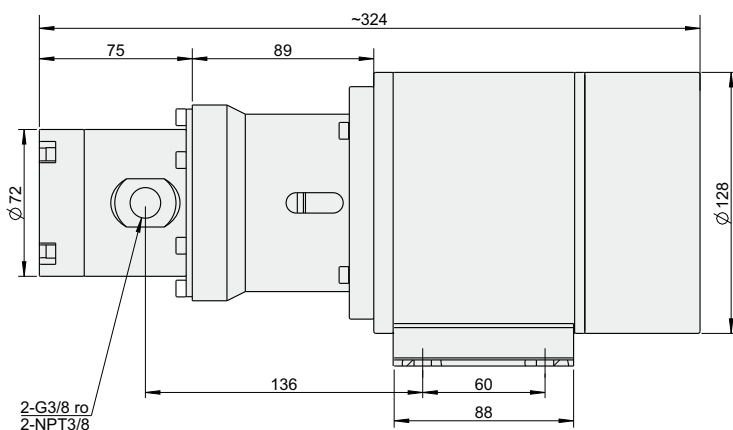
34

MPG | MRA | MRB | MRC | MRE | MRF | MGA

Pump Model	BLDC MOTORS	
MRC15/22	300w/400w BLDC	Unified Dimensions
MRC20/22		



Pump Model	BLDC MOTORS	
MRC15/22	600w BLDC	Unified Dimensions
MRC20/22		



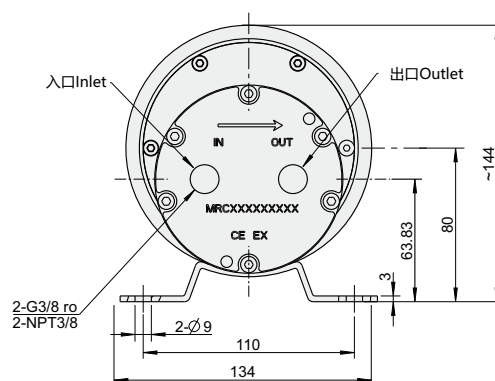
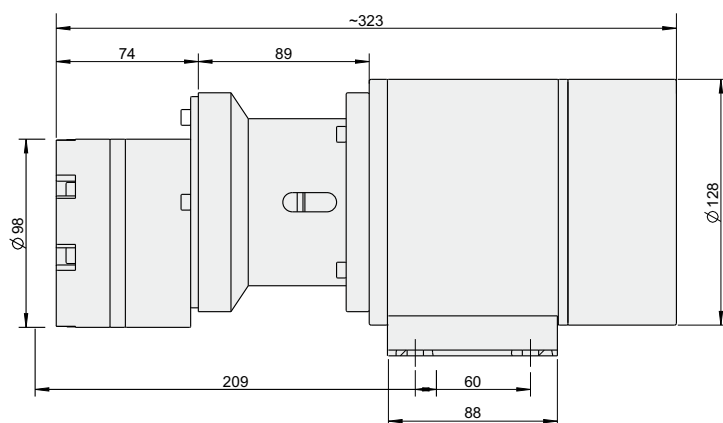
BLDC MOTORS

MRB + DC brushless motor

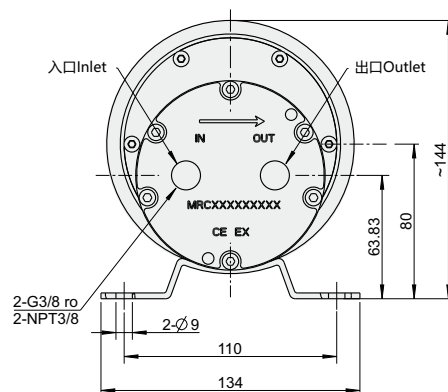
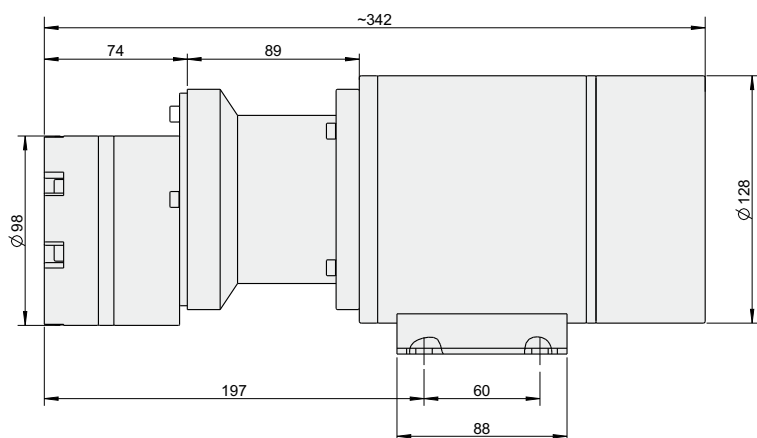
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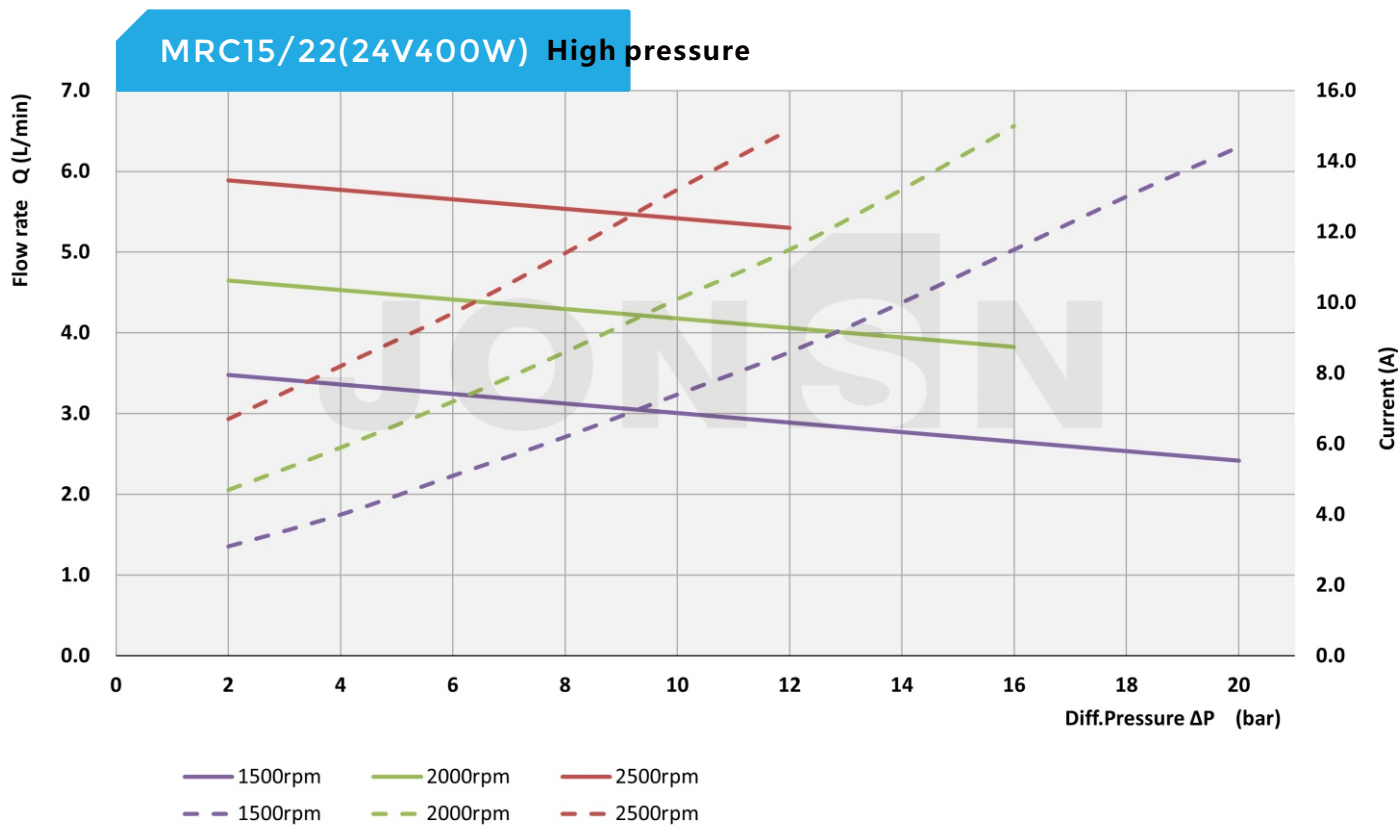
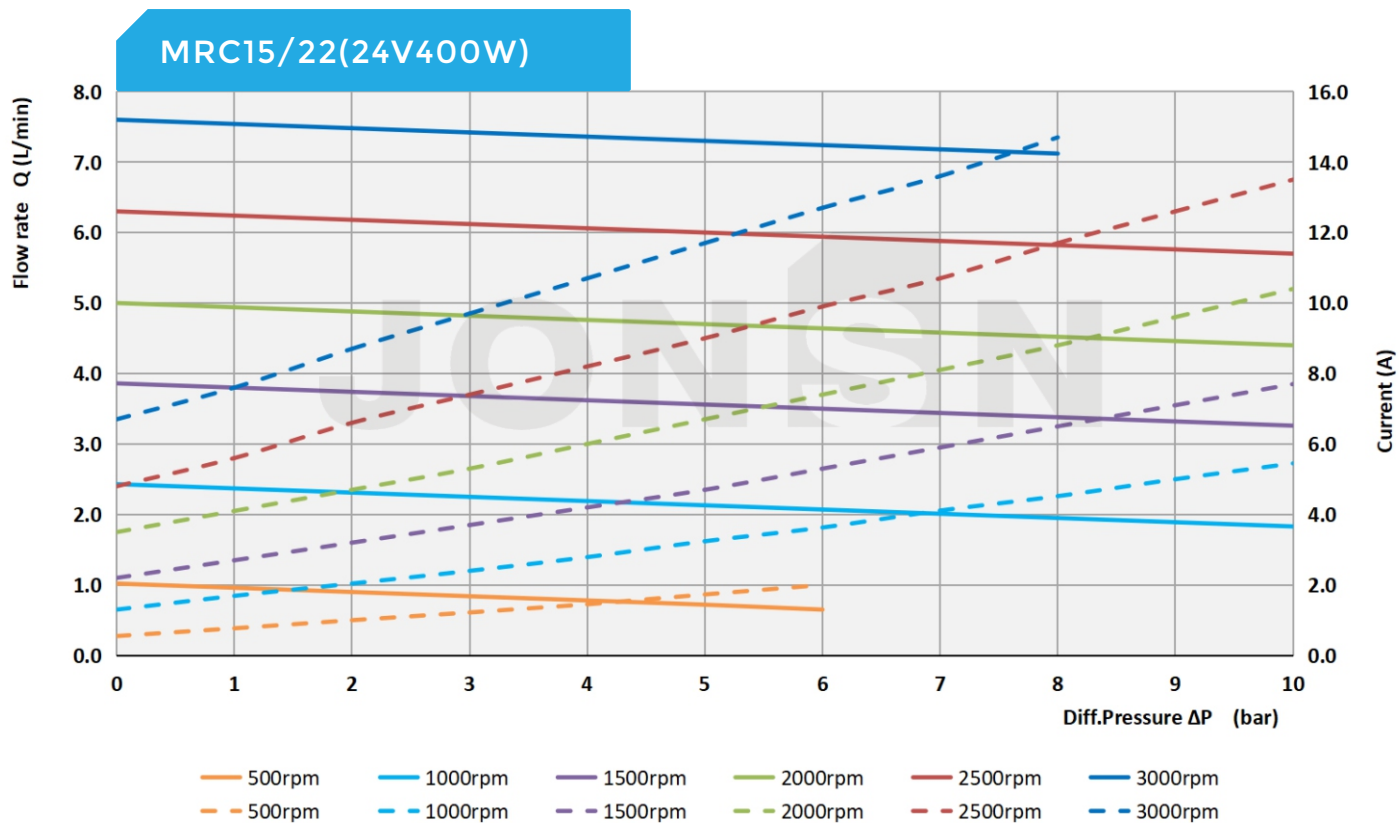
MPG | MRA | MRB | MRC | MRE | MRF | MGA

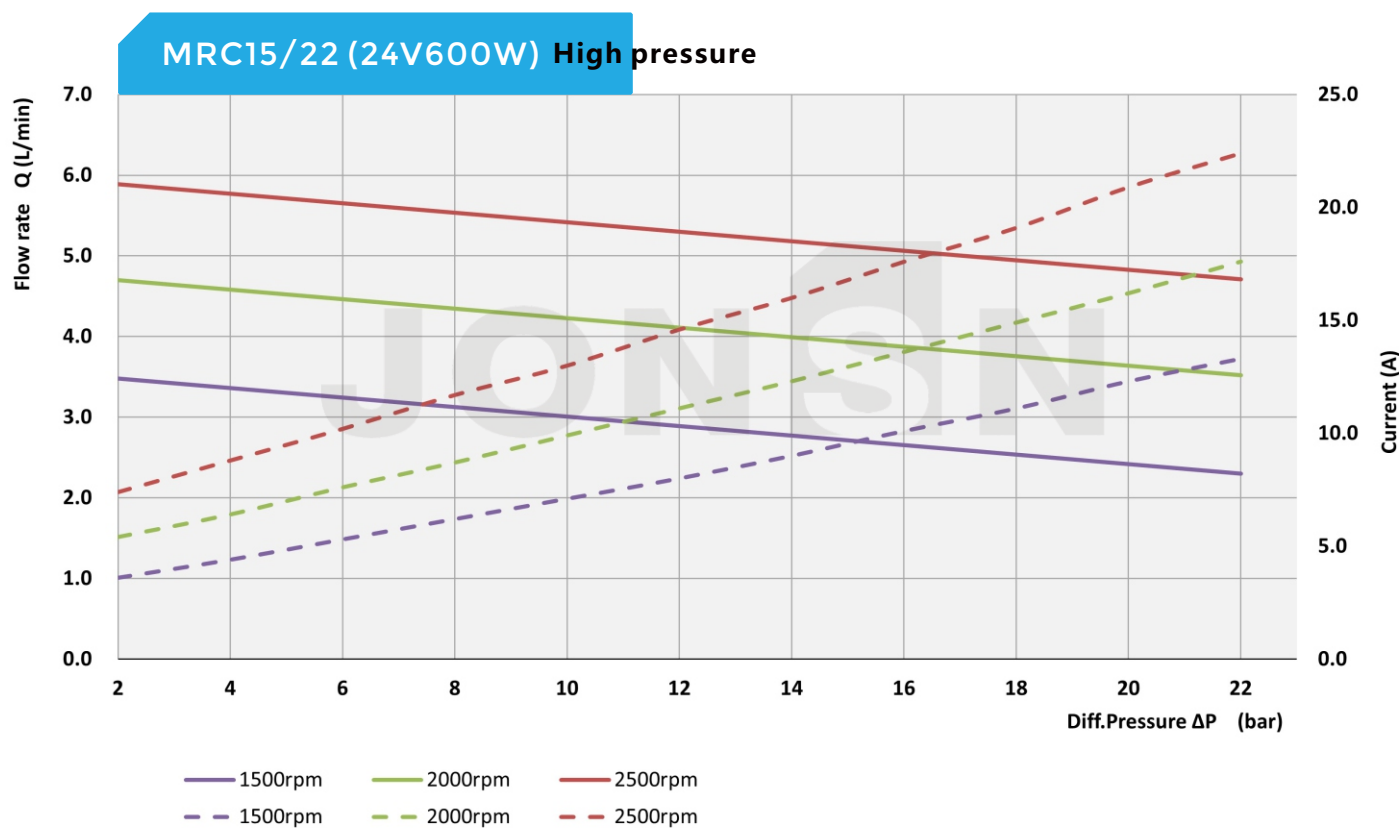
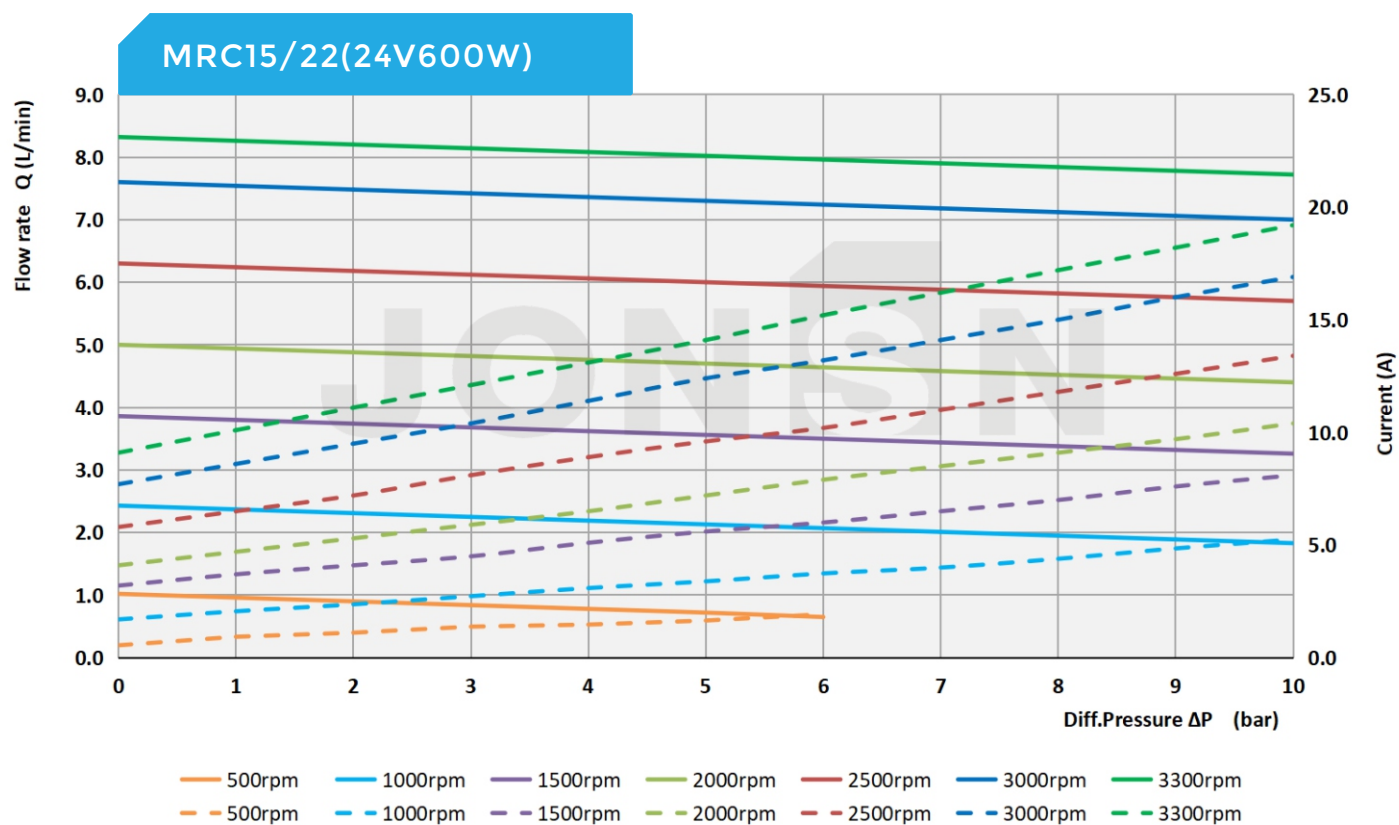
Pump Model	Brushless Motor	
MRC8/37	600w Brushless Motor	unified dimension
MRC12/37		

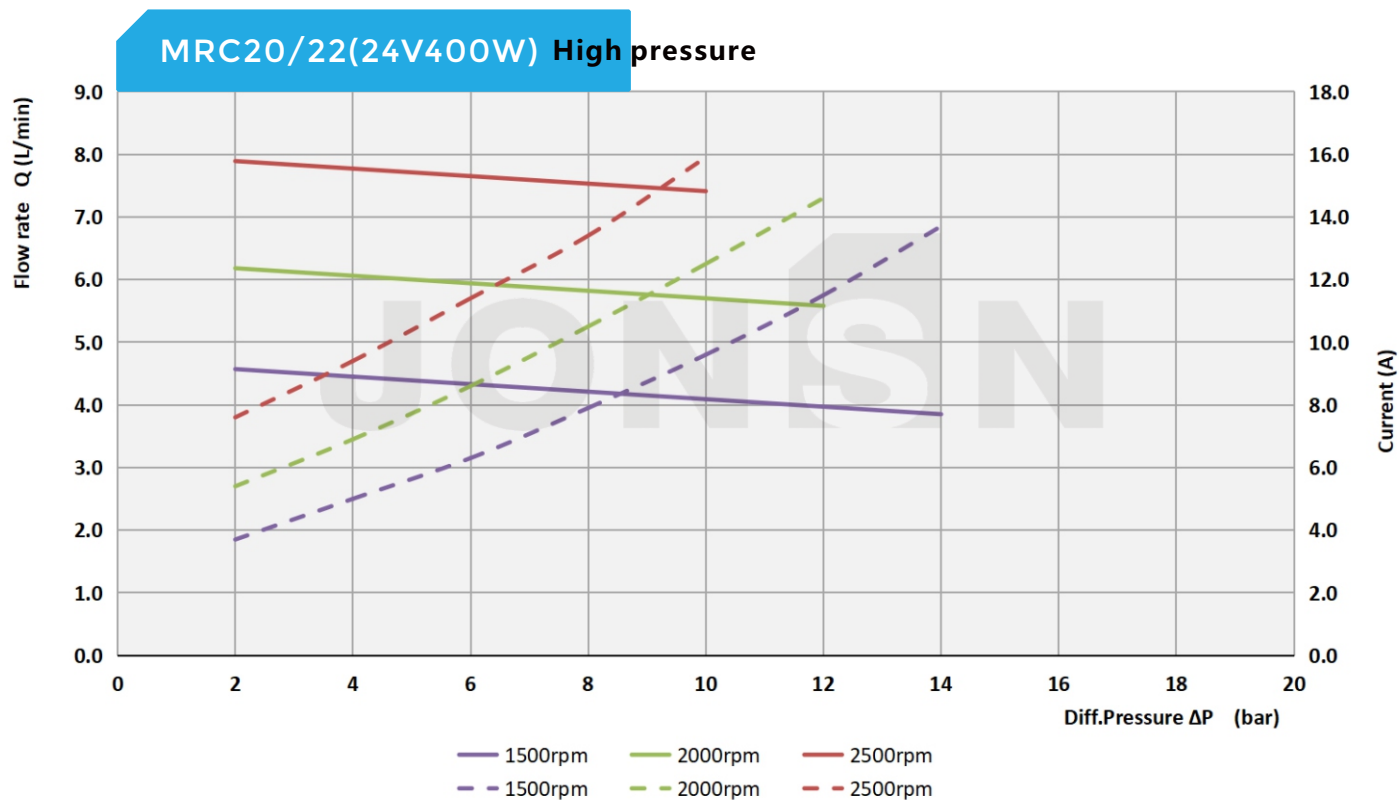
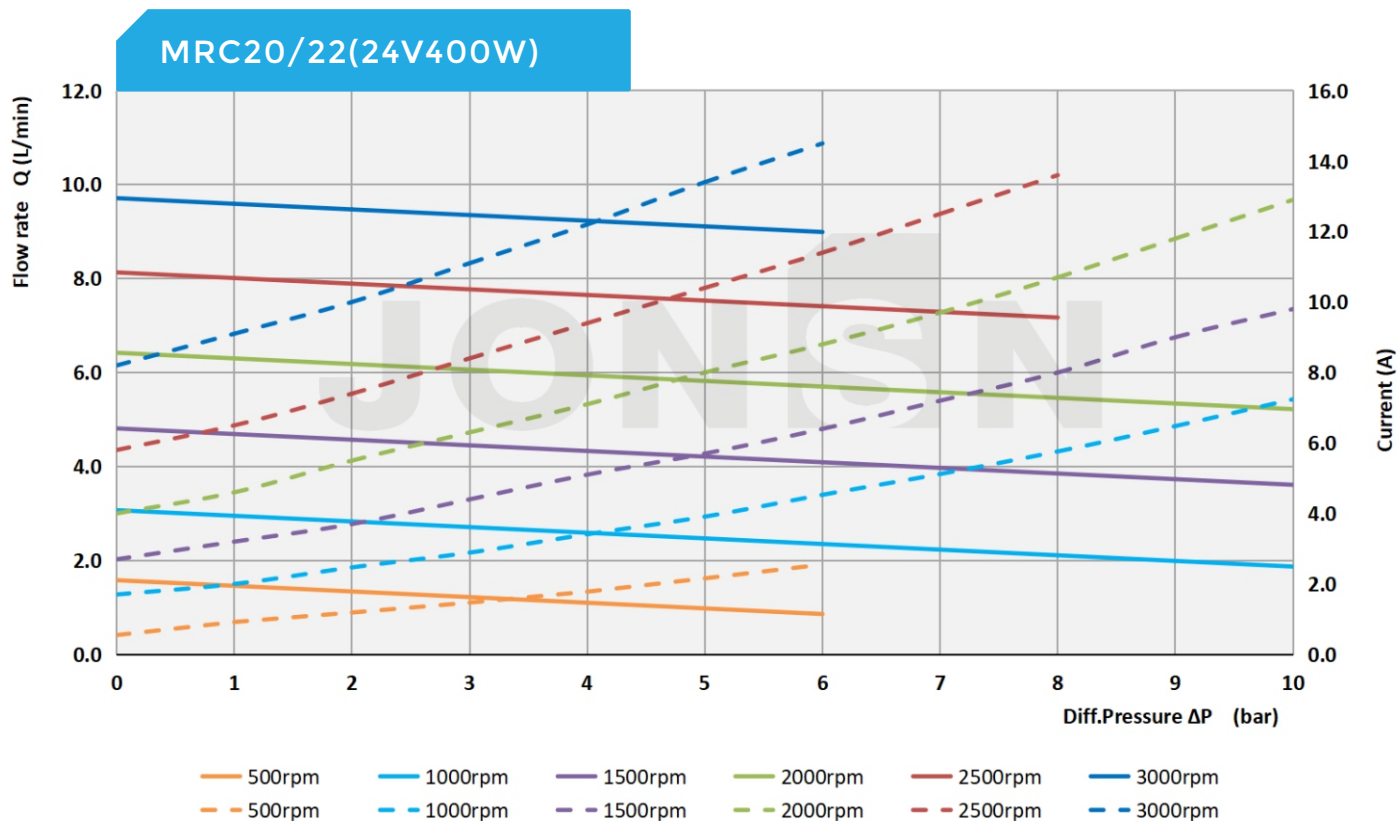


Pump Model	Brushless Motor	
MRC8/37	1500w/2000w Brushless Motor	unified dimension
MRC12/37		

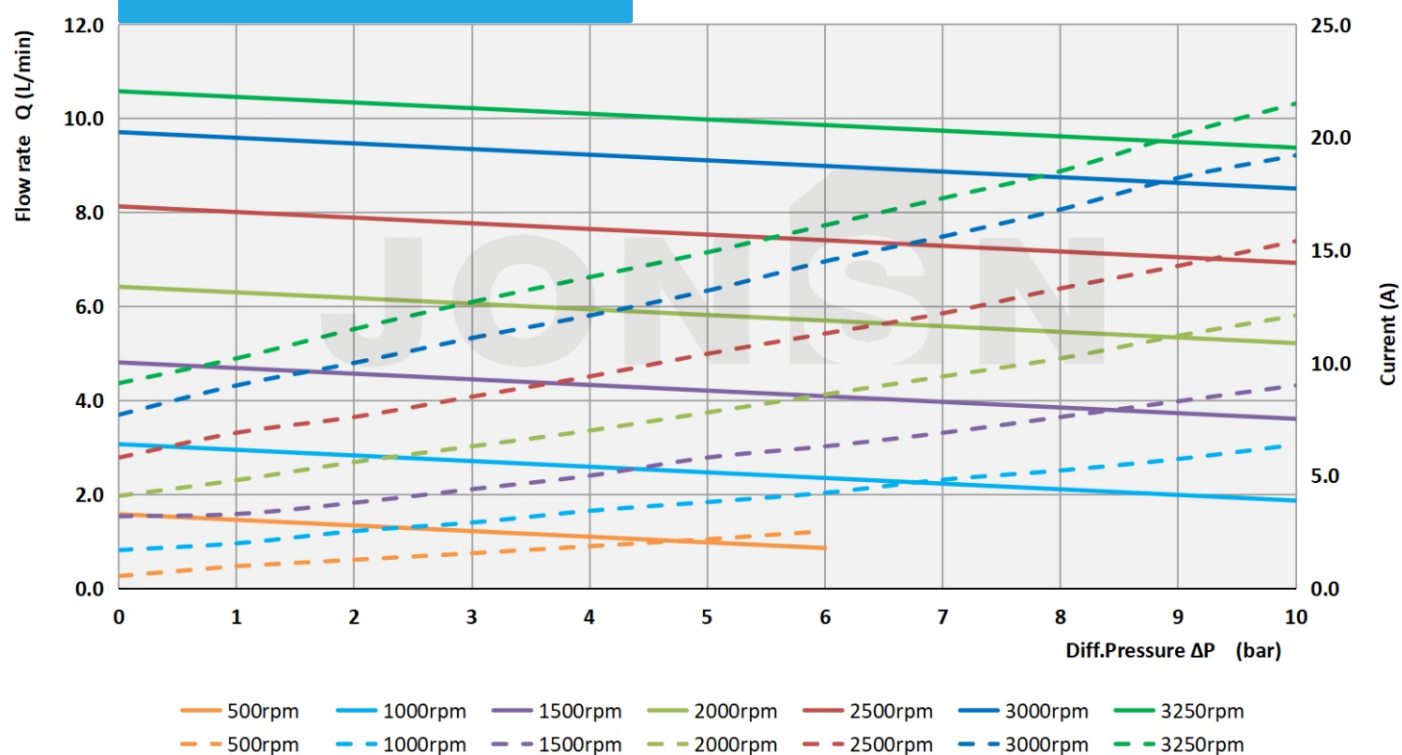




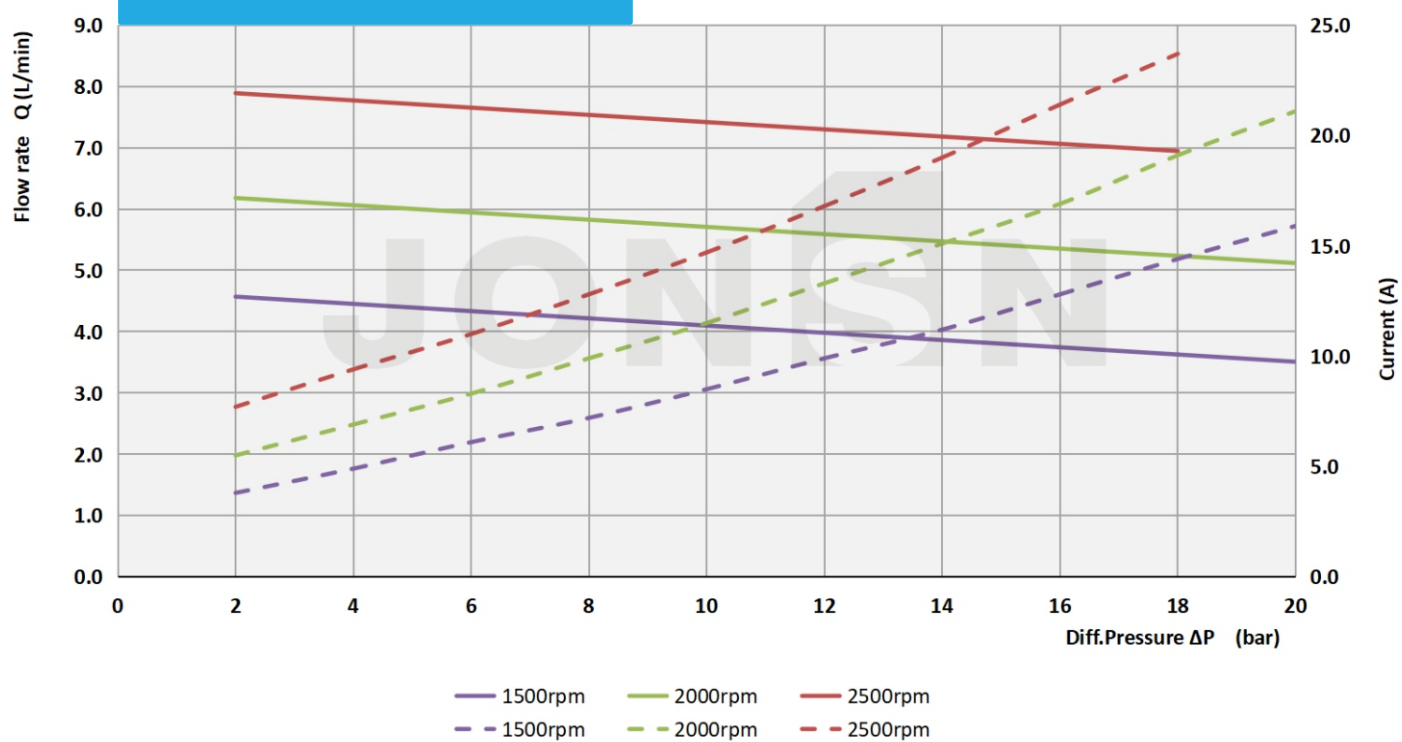




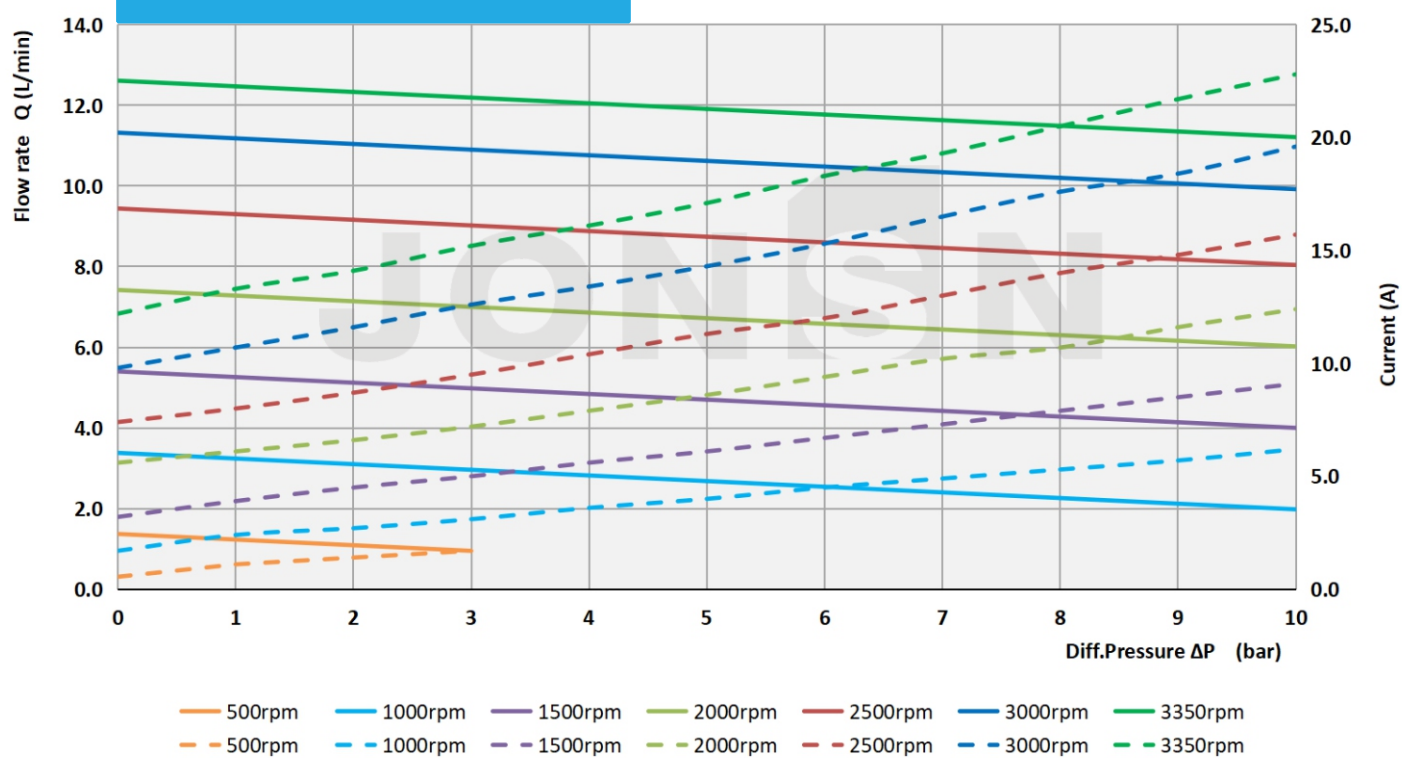
MRC20/22(24V600W)



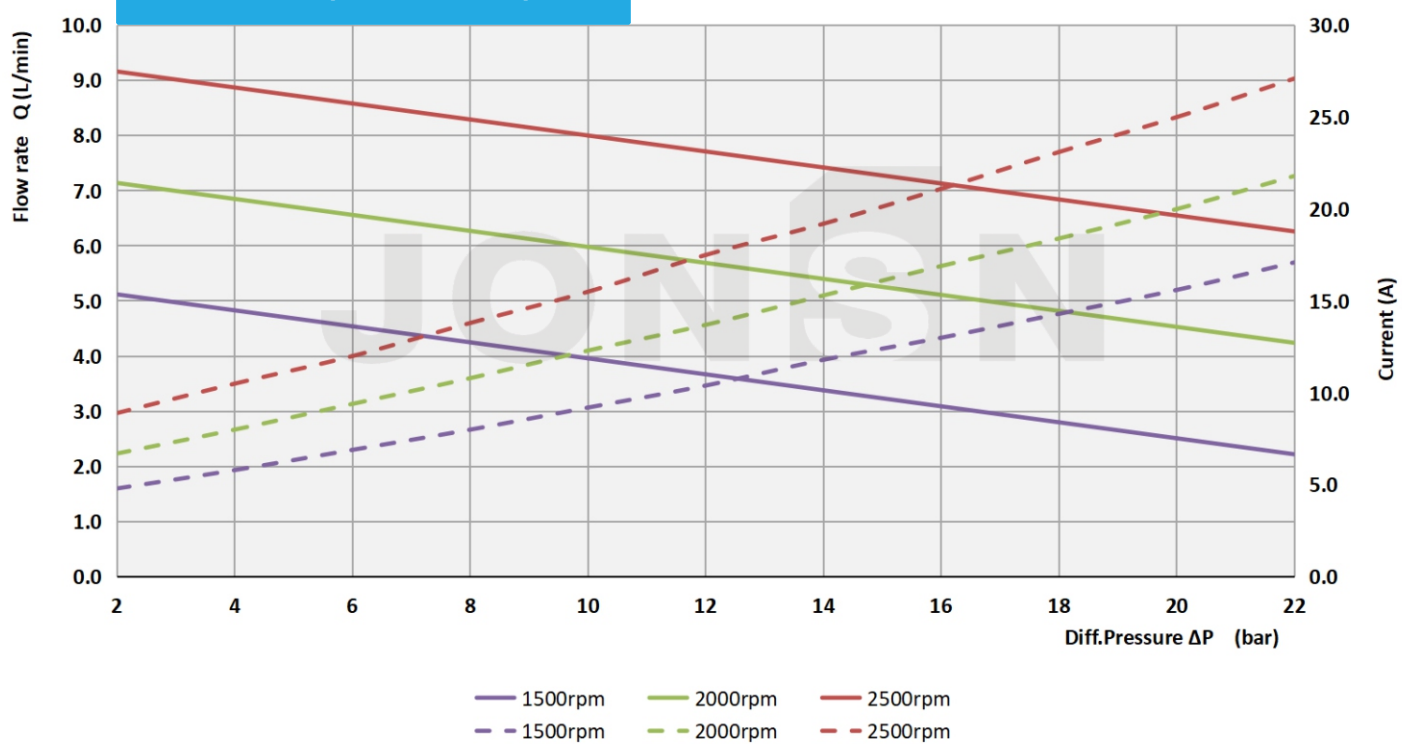
MRC20/22 (24V600W) High pressure

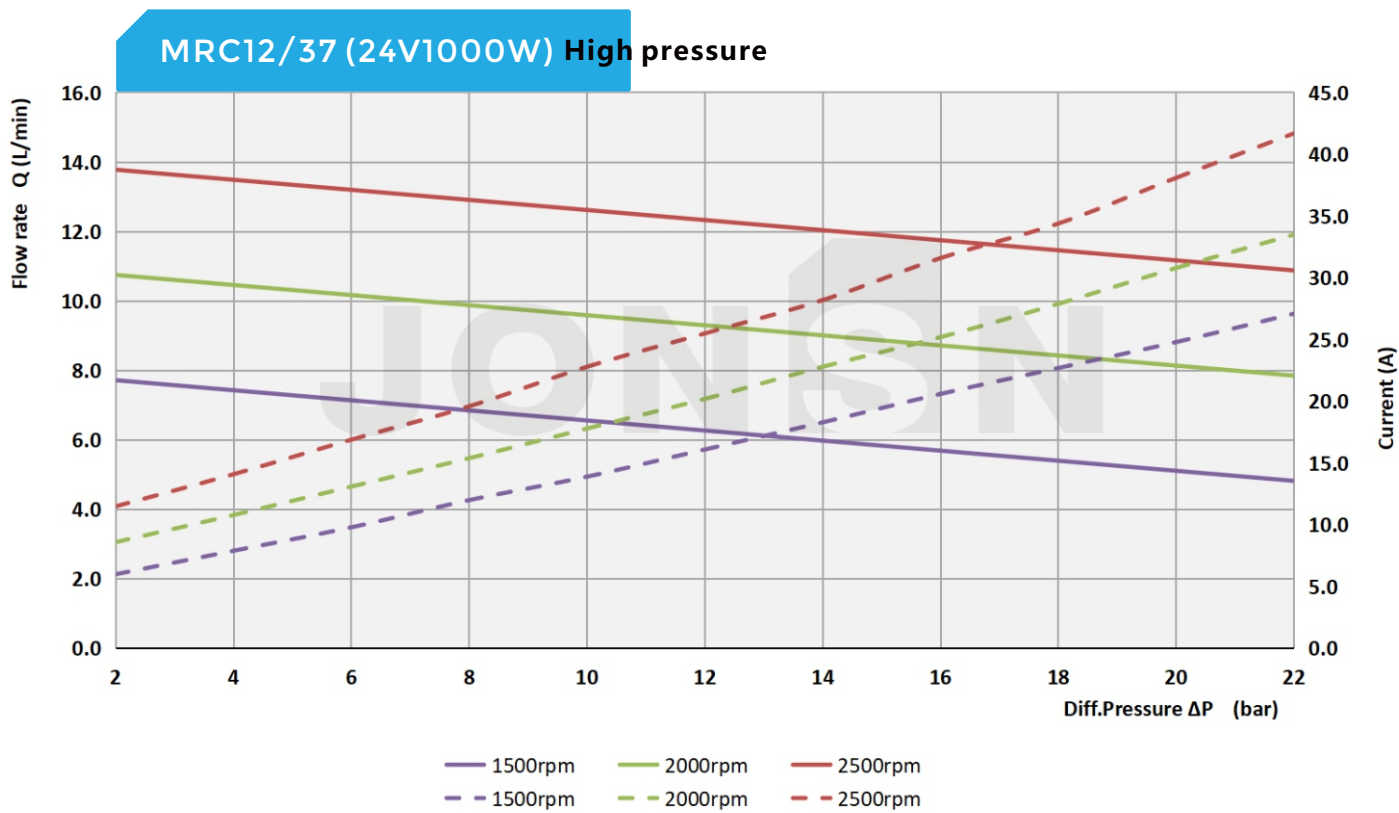
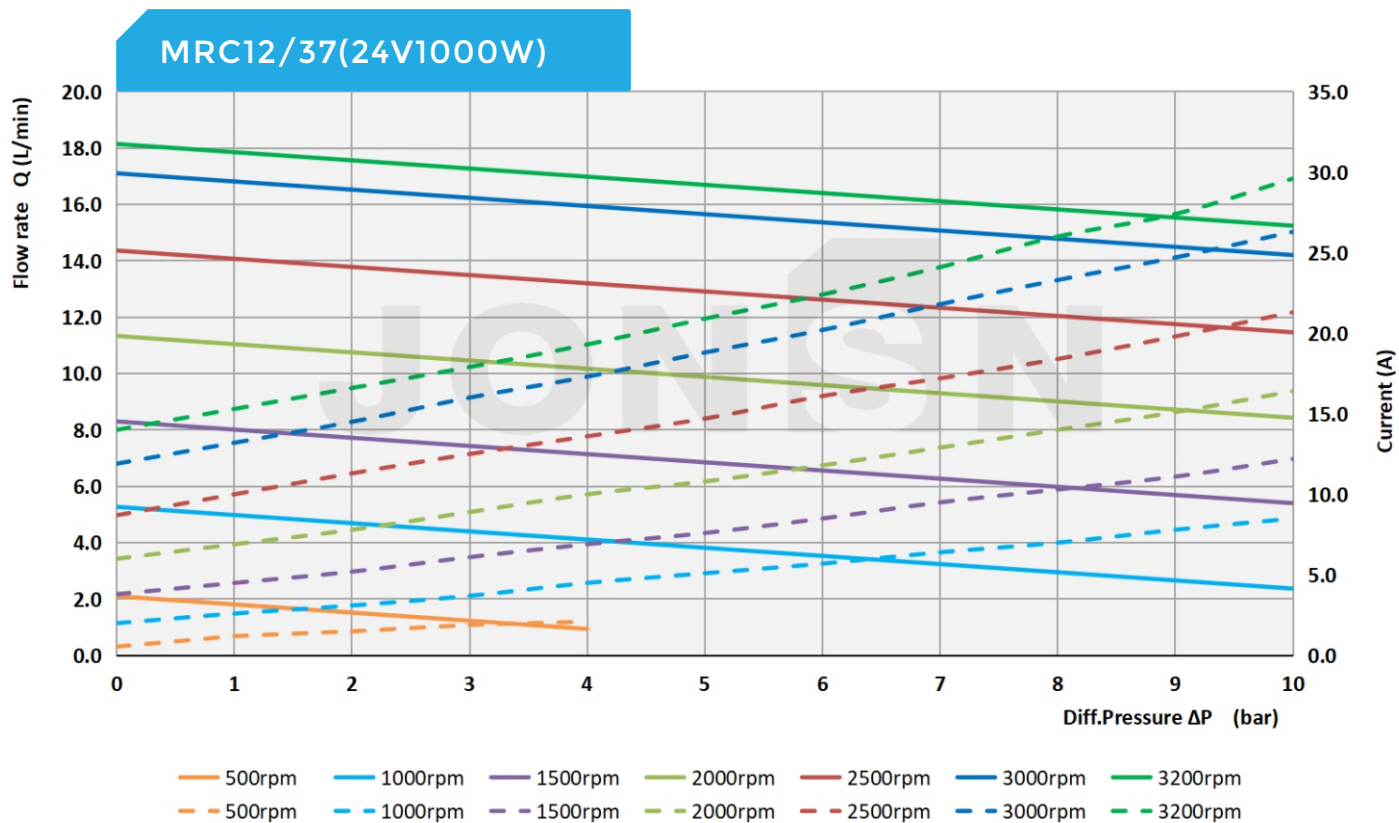


MRC8/37(24V1000W)



MRC8/37(24V1000W) High pressure





BLDC MOTORS

MRE+DC brushless motor

MRE Series Micro Gear Pump

Flow range: 4–40 L/min Working differential

pressure: 0.5–25 bar

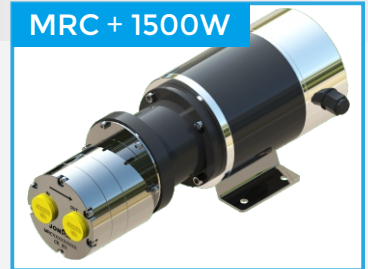
Applicable viscosity: 0.4–3000 mPa·s (similar to water)

Pump max pressure resistance: 6 MPa

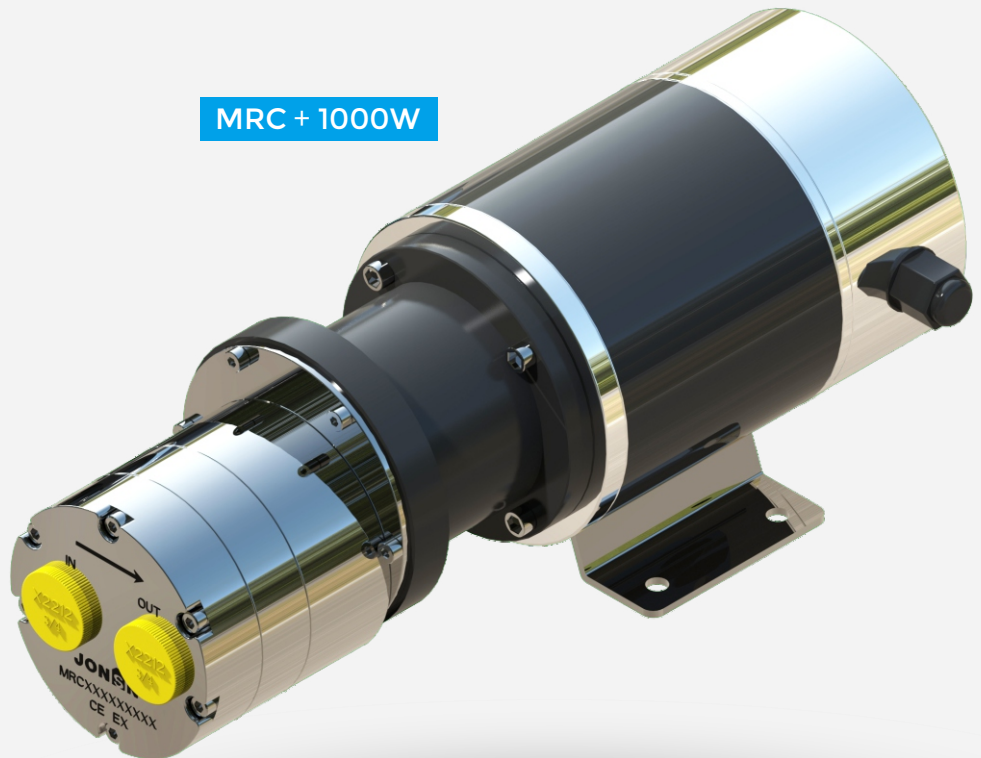
JONSN precision micro magnetic gear pumps are applicable for the pumping systems of:

deionized water, methanol, urea solution, kerosene, lubricating oil, additives, auxiliaries, lye, ammonia solution, cobalt liquid, dialysate, ethylene glycol, freon, ink, glycerin, phenolic resin, curing agent, flavors and fragrances, fluorinated liquid.

MRC + 1500W



MRC + 1000W

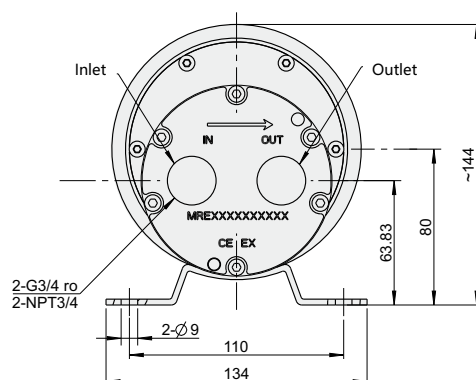
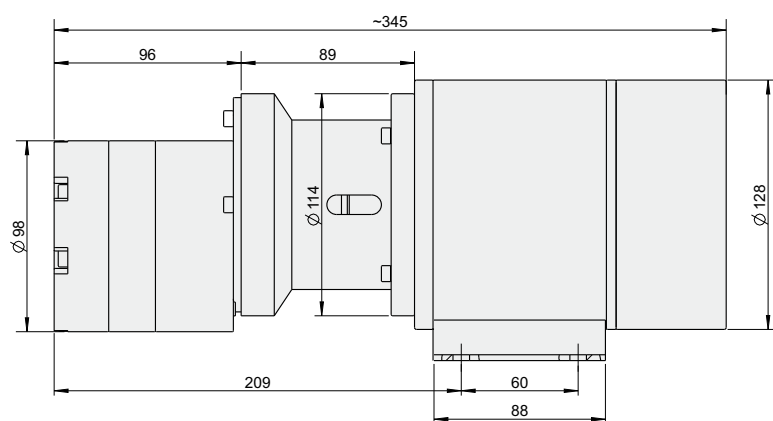


BLDC MOTORS

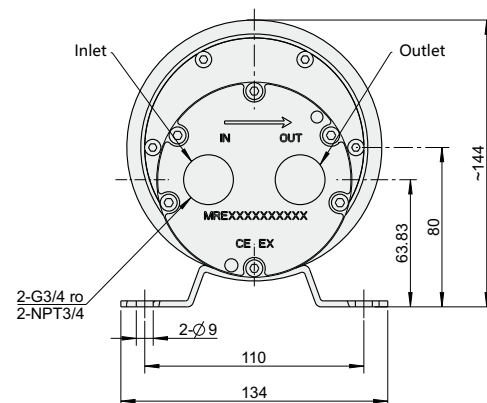
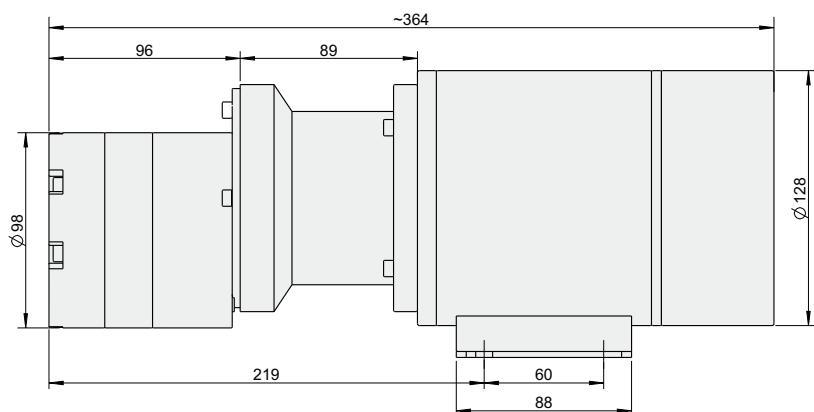
MRE+DC brushless motor

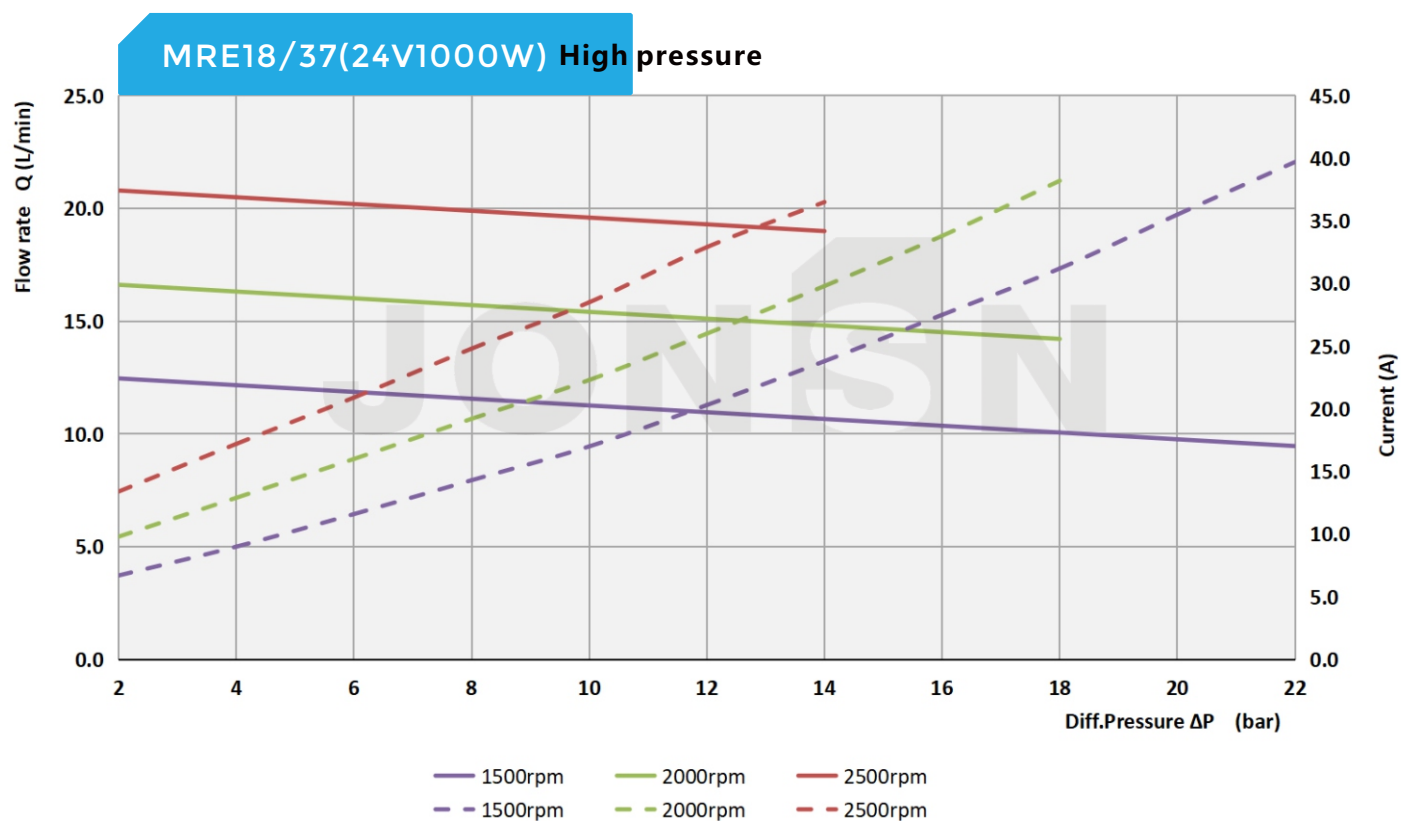
43

Pump Model	Brushless motor	
MRE18/37	600w brushless motor	unified dimension
MRE24/37		
MRE34/37		

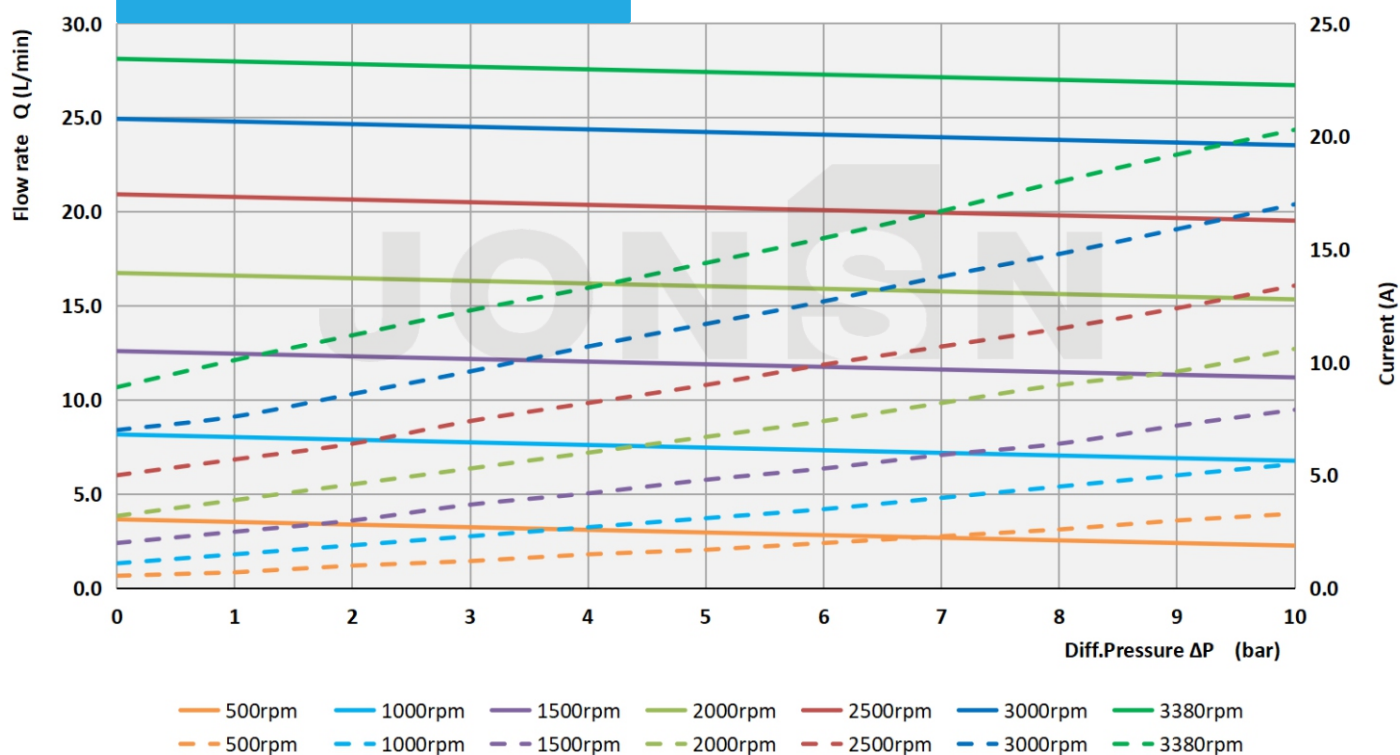


Pump Model	Brushless motor	
MRE18/37	1500w/2000w brushless motor	unified dimension
MRE24/37		
MRE34/37		

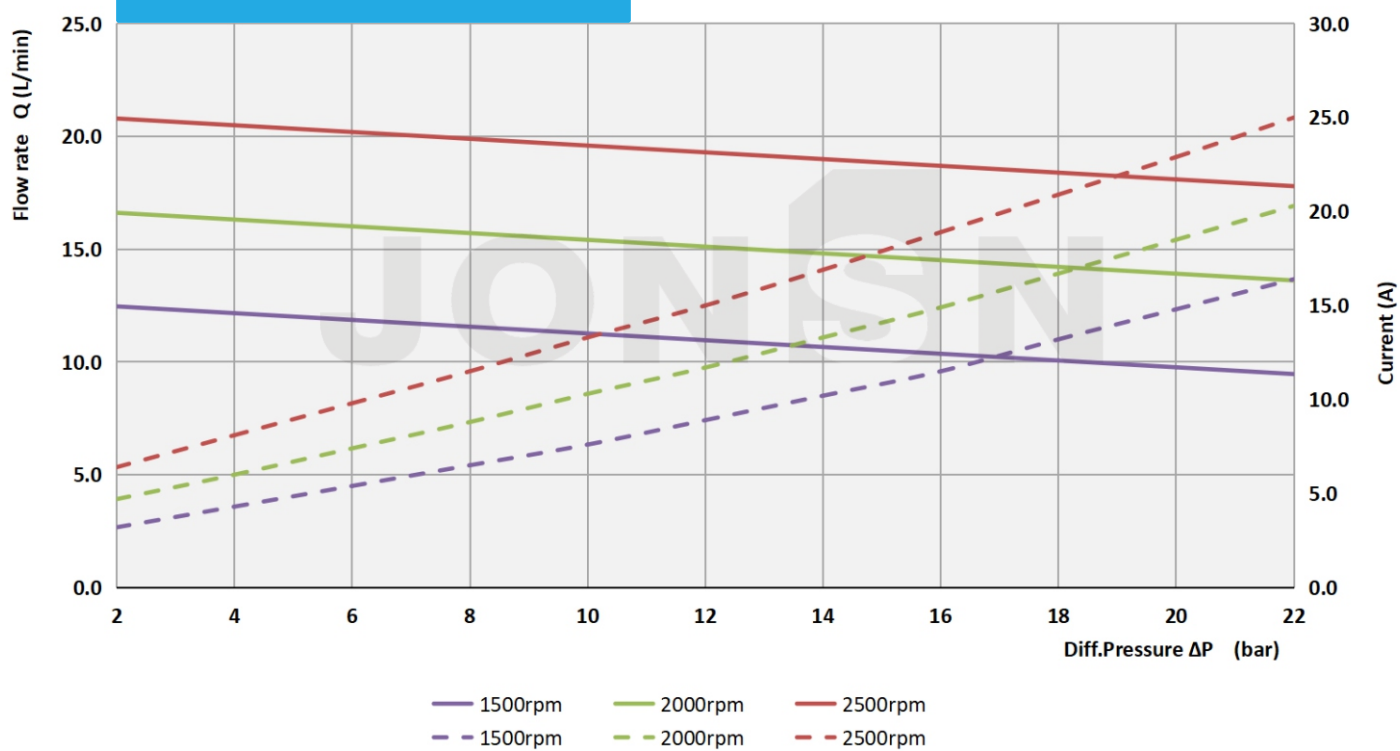




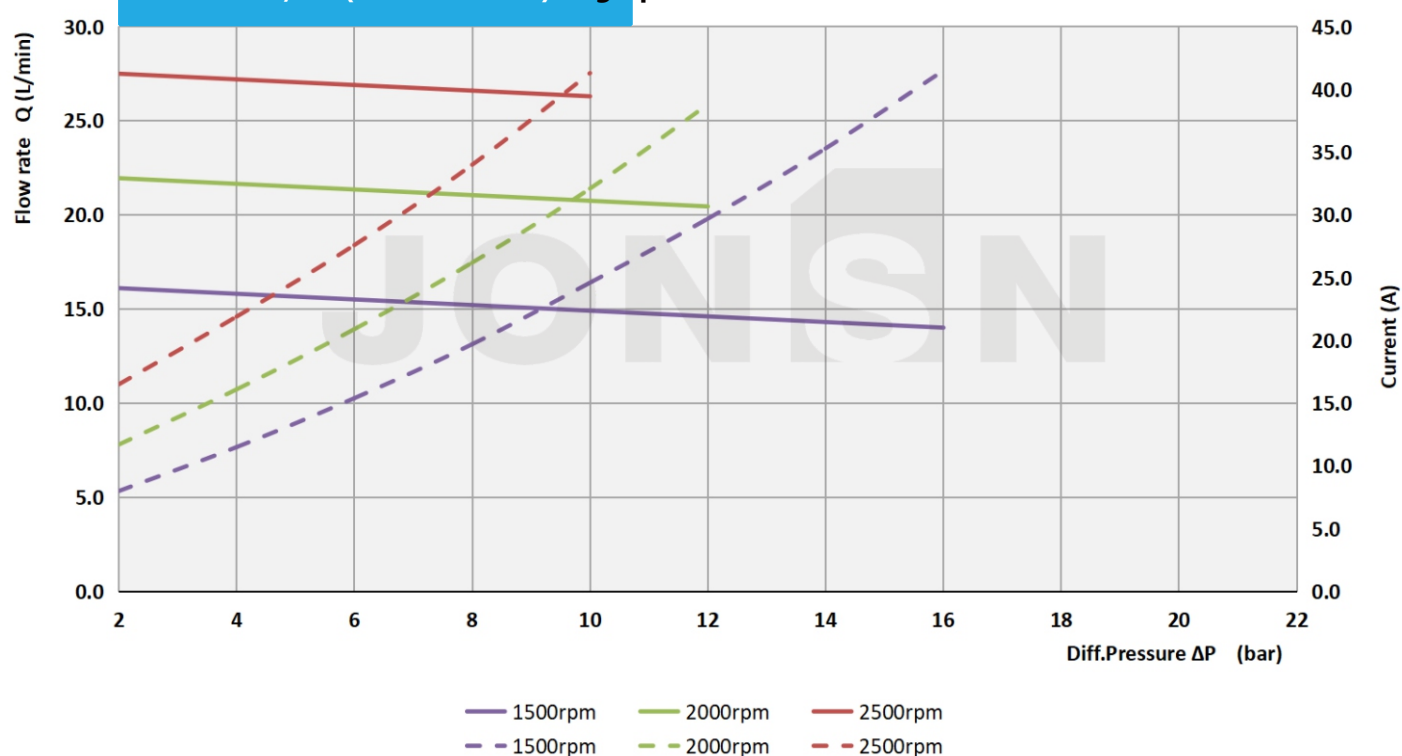
MRE18/37(48V1500W)



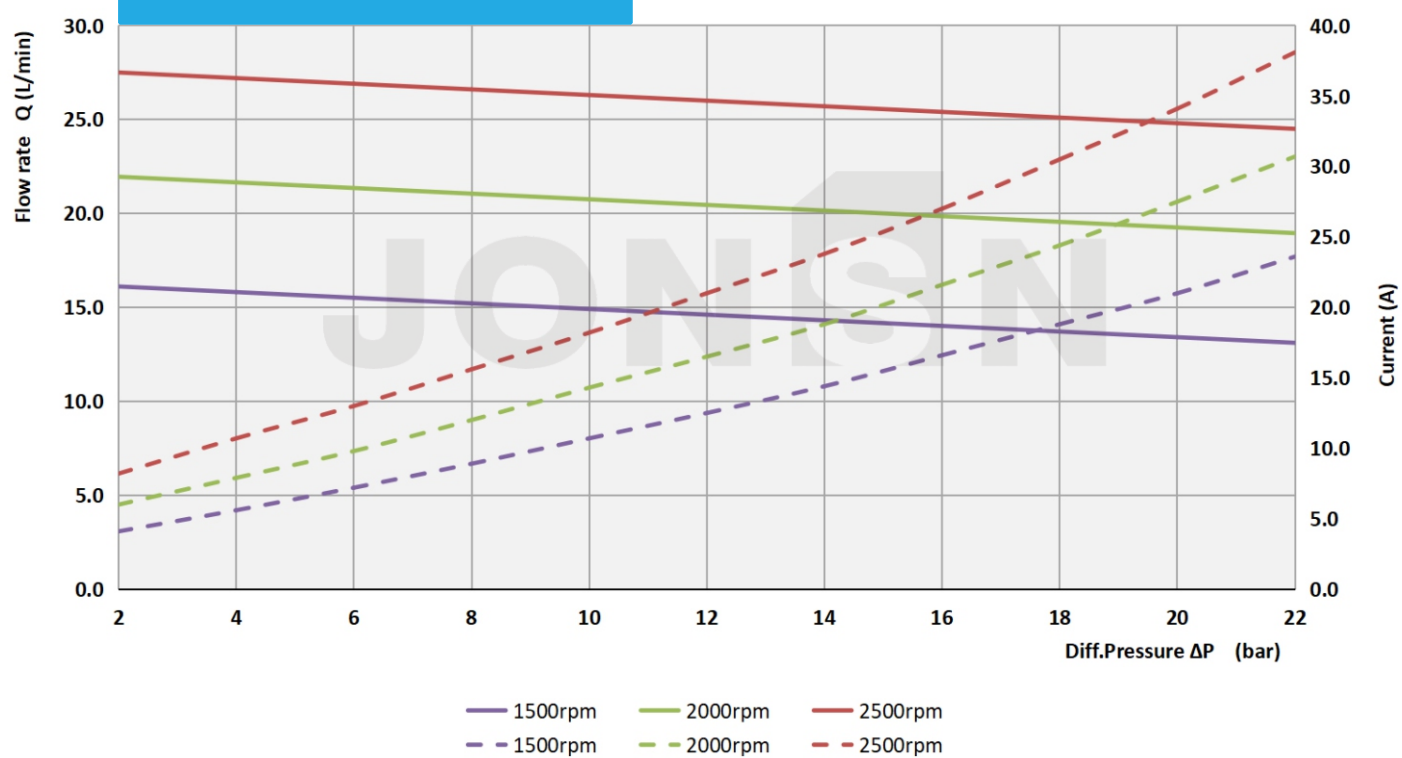
MRE18/37 (48V1500W) High pressure



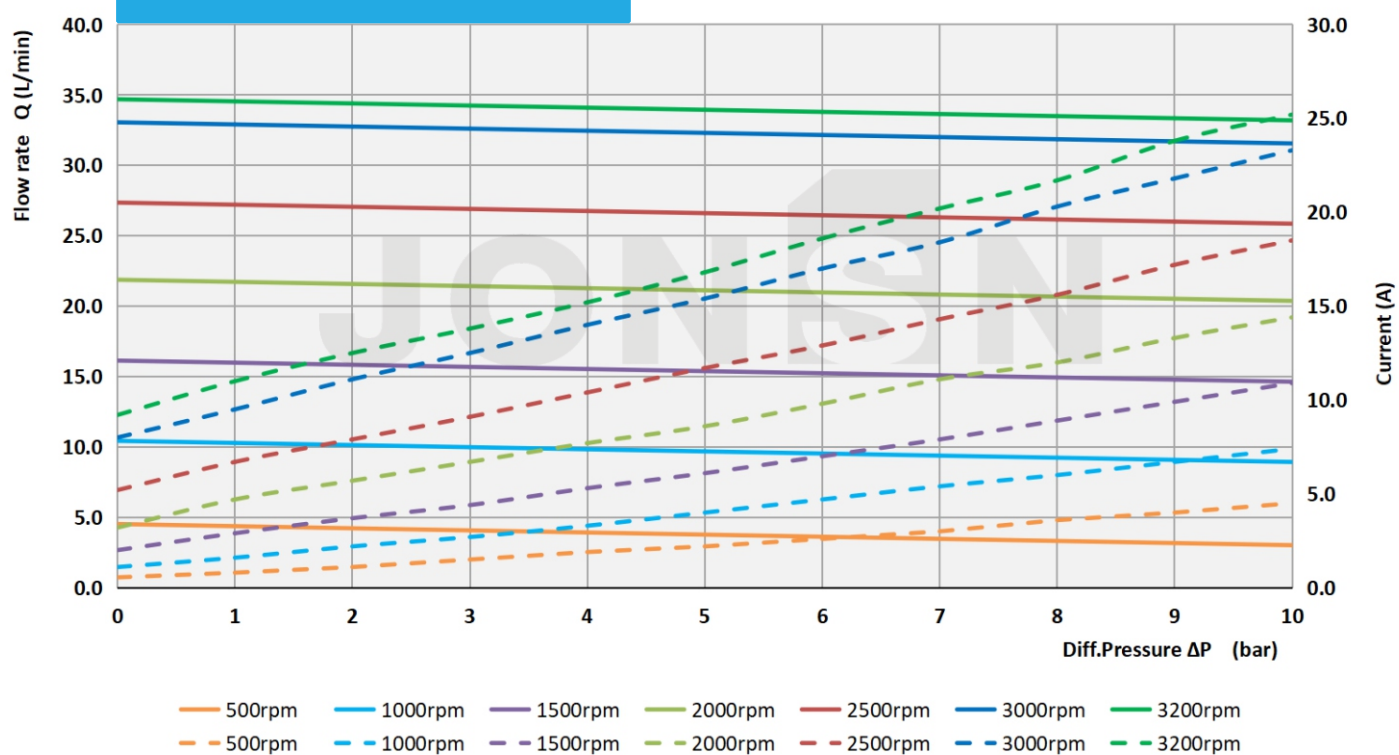
MRE24/37(24V1000W) High pressure



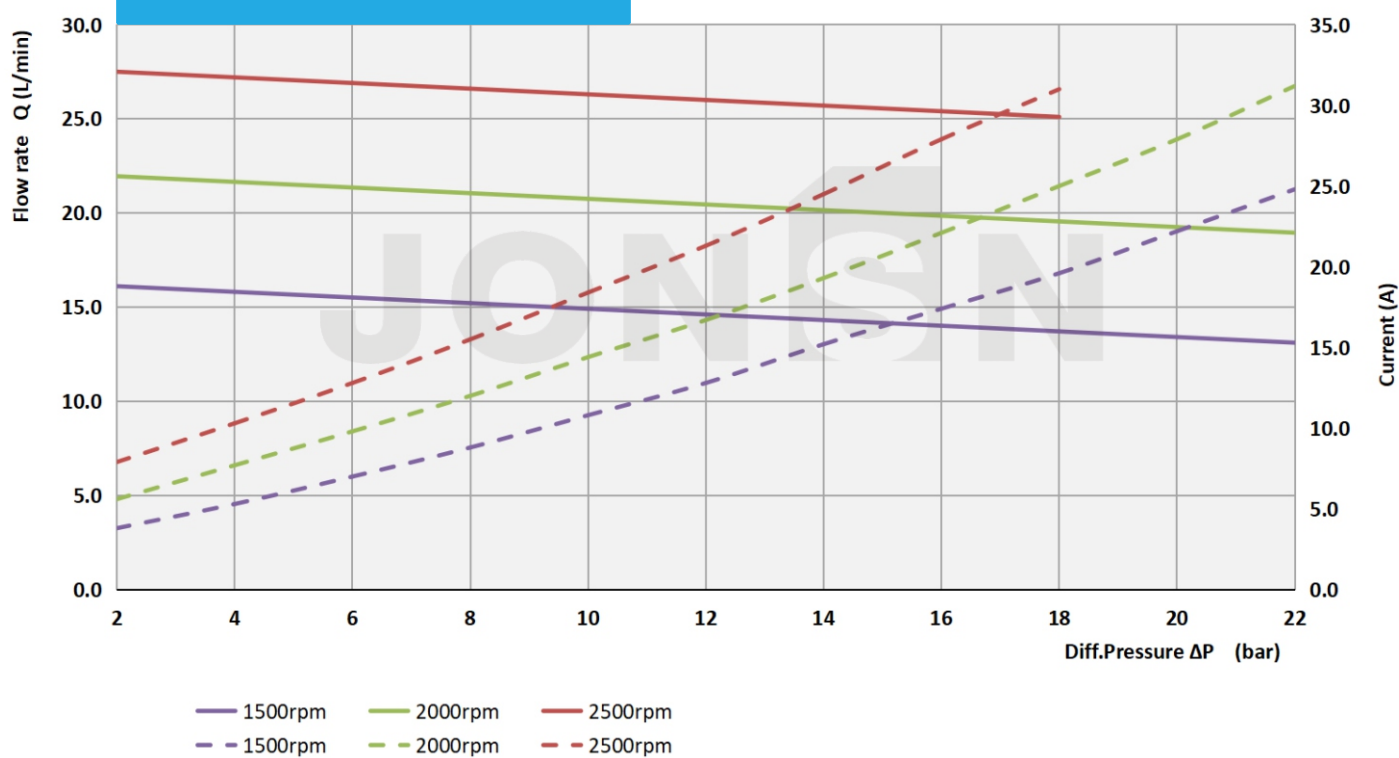
MRE24/37 (24V2000W) High pressure

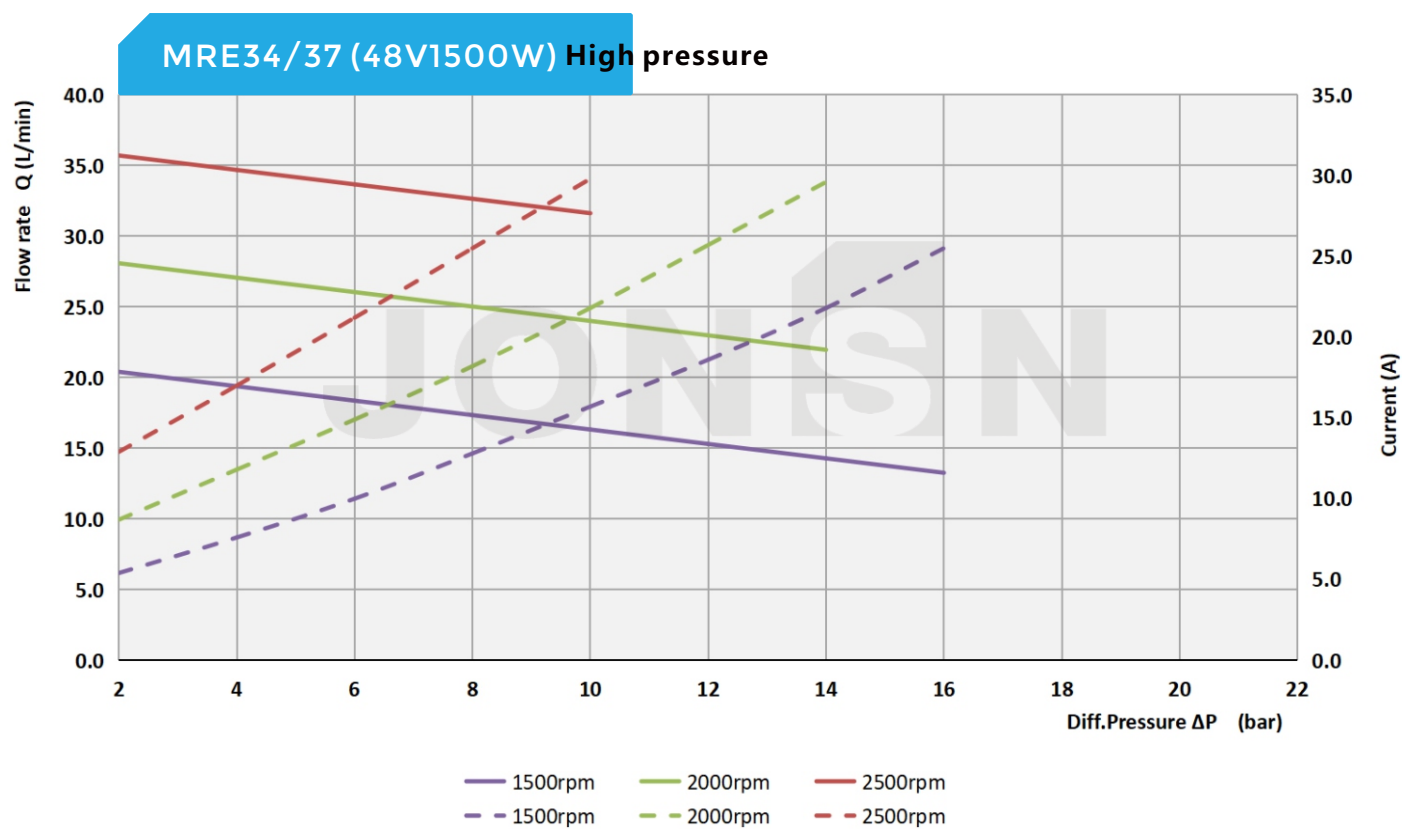


MRE24/37(48V1500W)

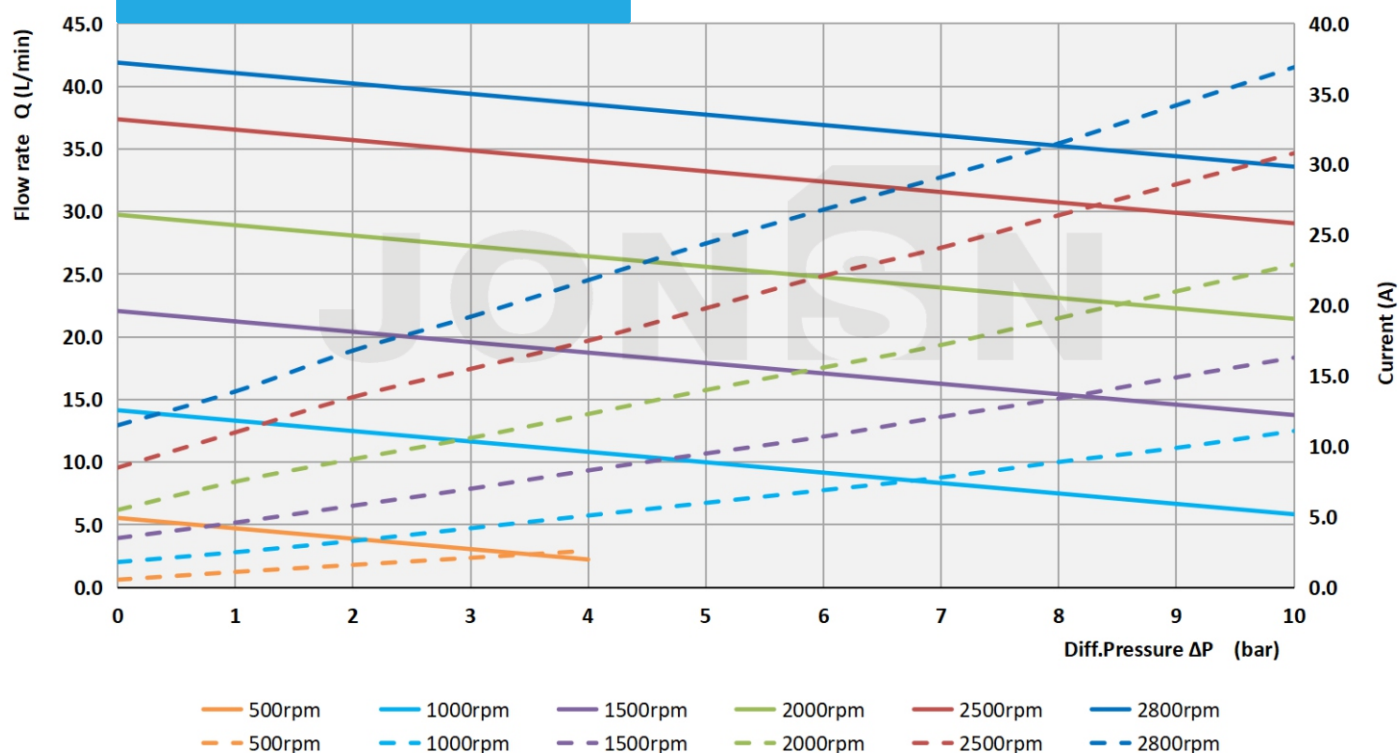


MRE24/37(48V1500W) High pressure

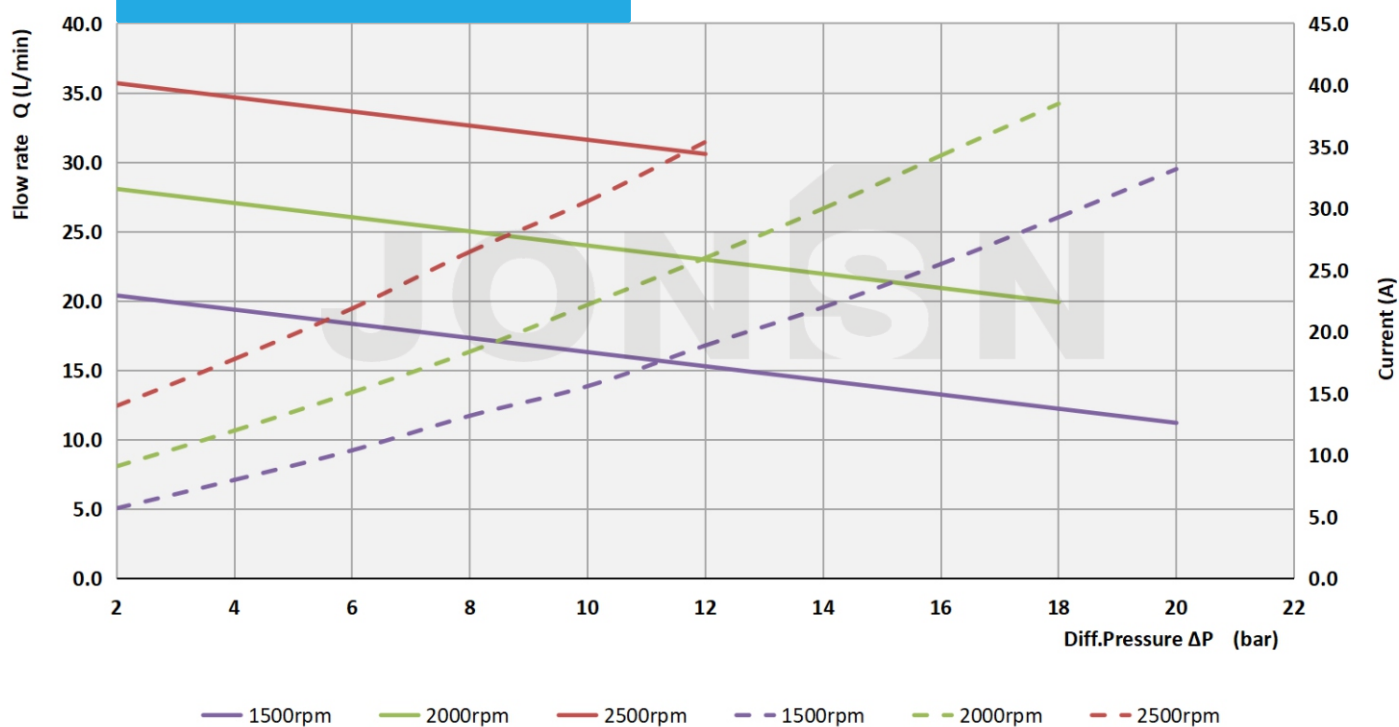




MRE34/37(48V2000W)



MRE34/37(48V2000W) High pressure



BLDC MOTORS

MRV + DC brushless motor

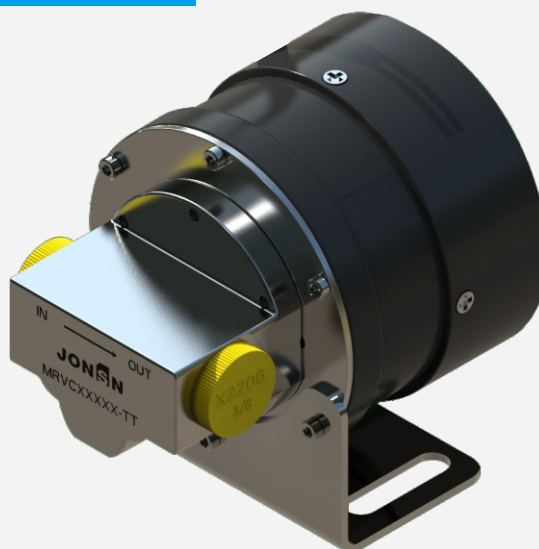
MRV Compact Commercial Supporting Gear Pump & 0.4–6.8 L/min

The MRV series is specially designed for equipment supporting applications and limited installation spaces, featuring flexible pipeline installation. With a simplified internal structure and one-piece cast steel pump body, it delivers robust construction and long-lasting durability.

JONSN precision micro magnetic gear pumps are applicable to pumping systems including micro-volume liquid transfer, dosing, lubrication, spraying, dispensing, sampling, coding, pressurization, circulation, coating, painting and metering.

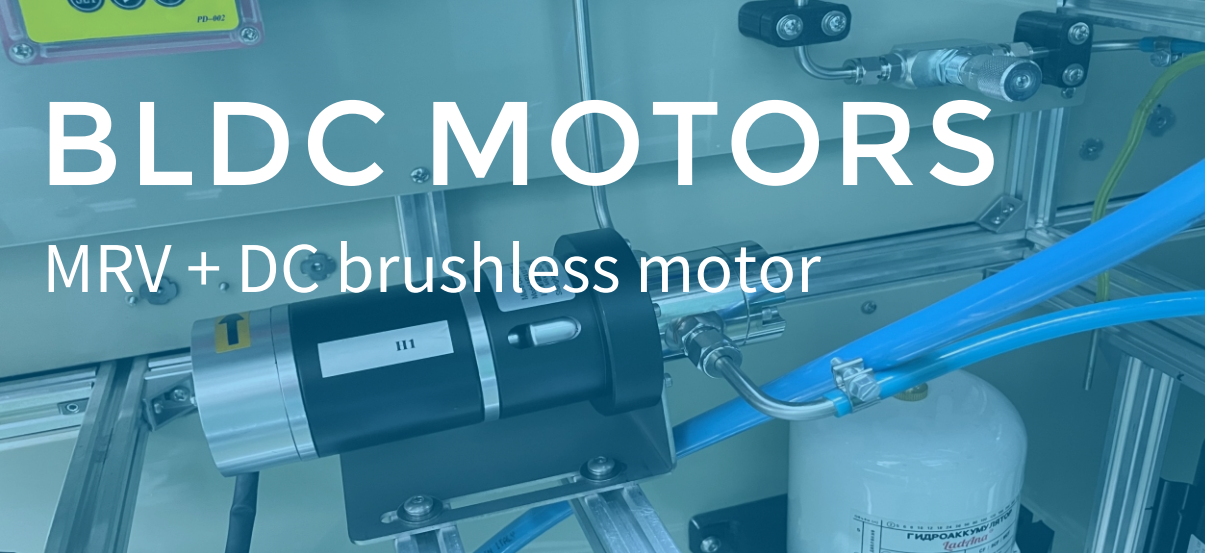


MRV + 150W

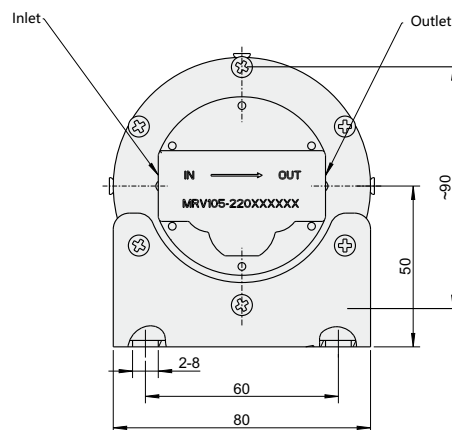
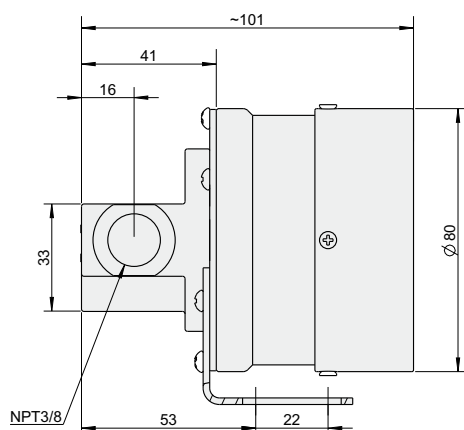


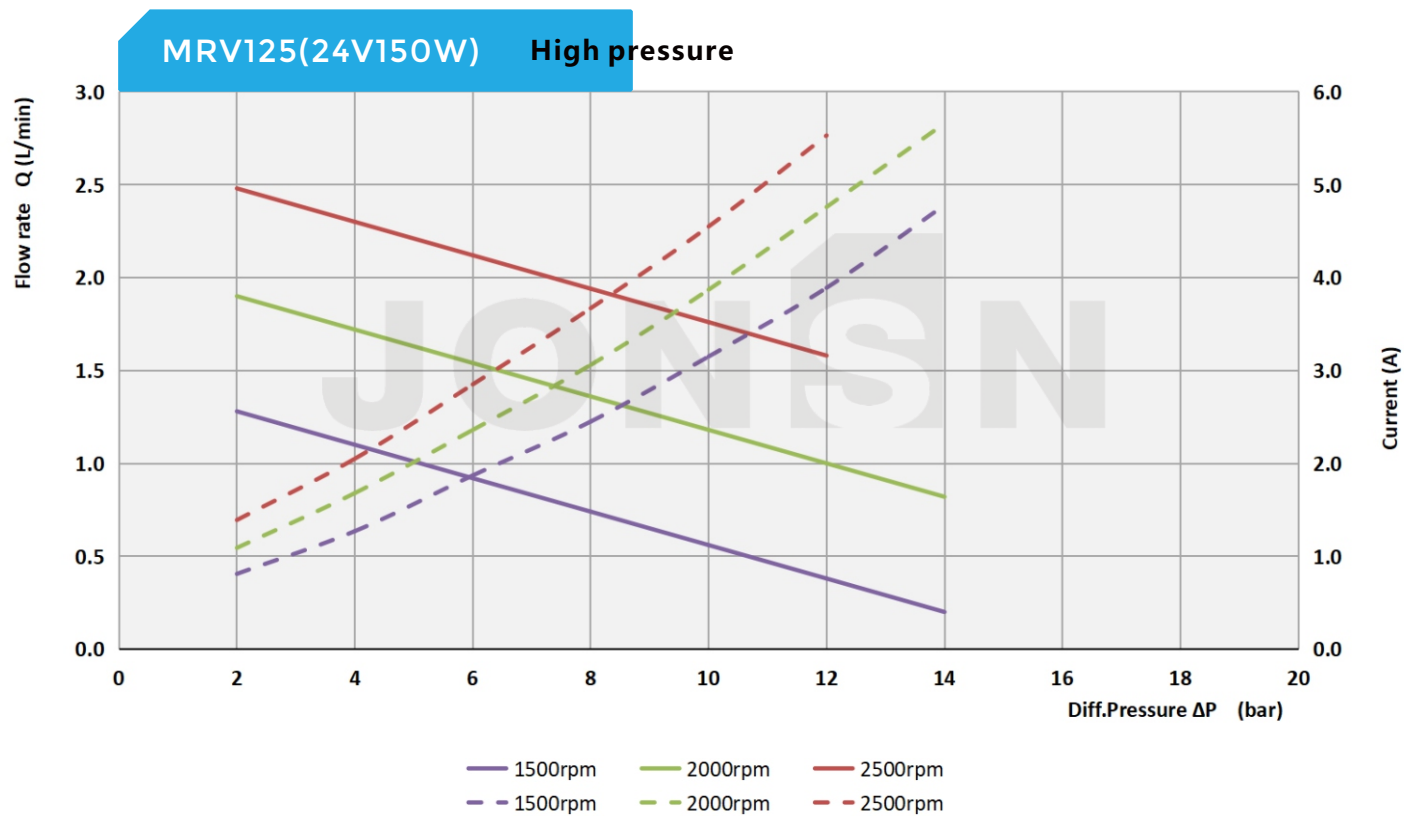
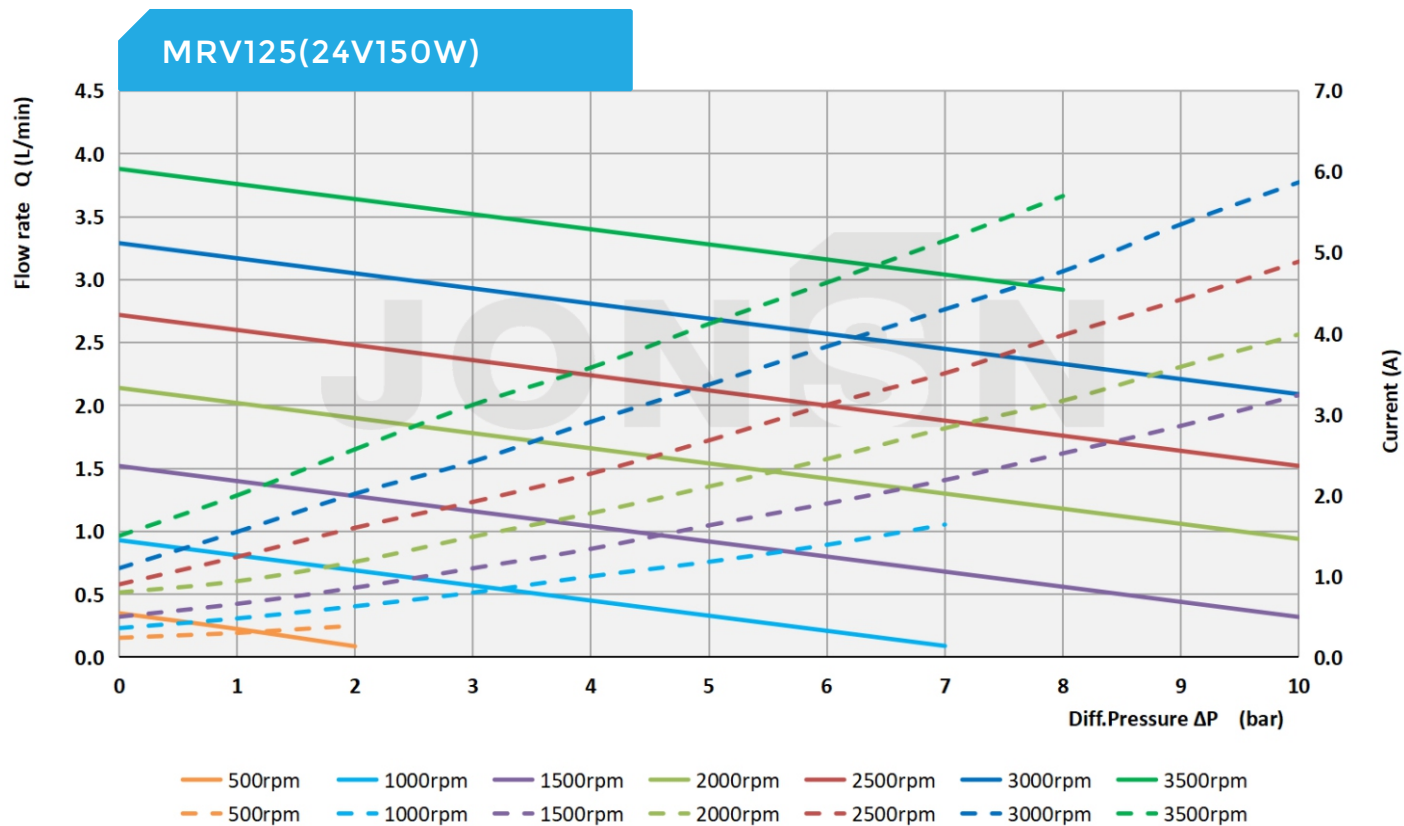
BLDC MOTORS

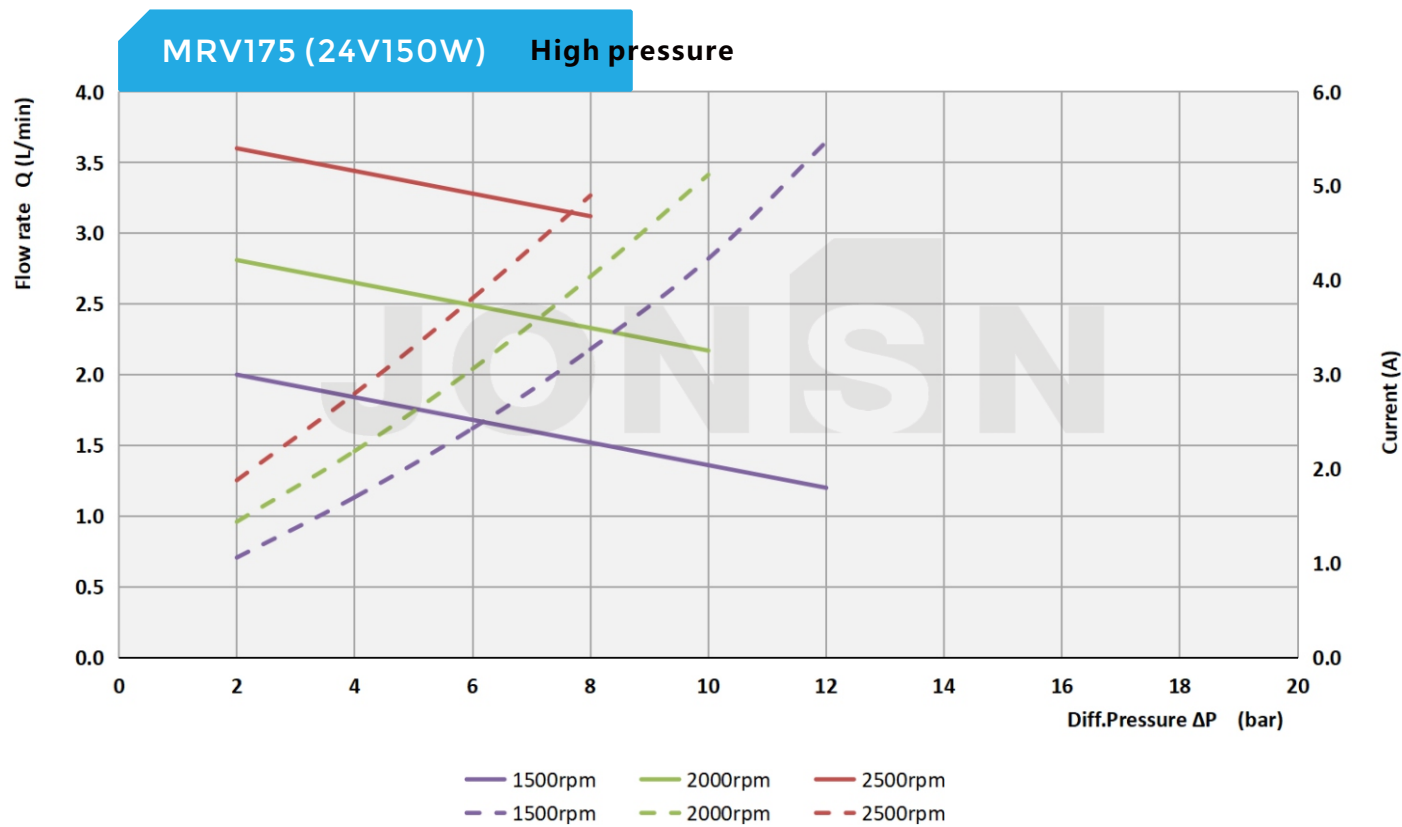
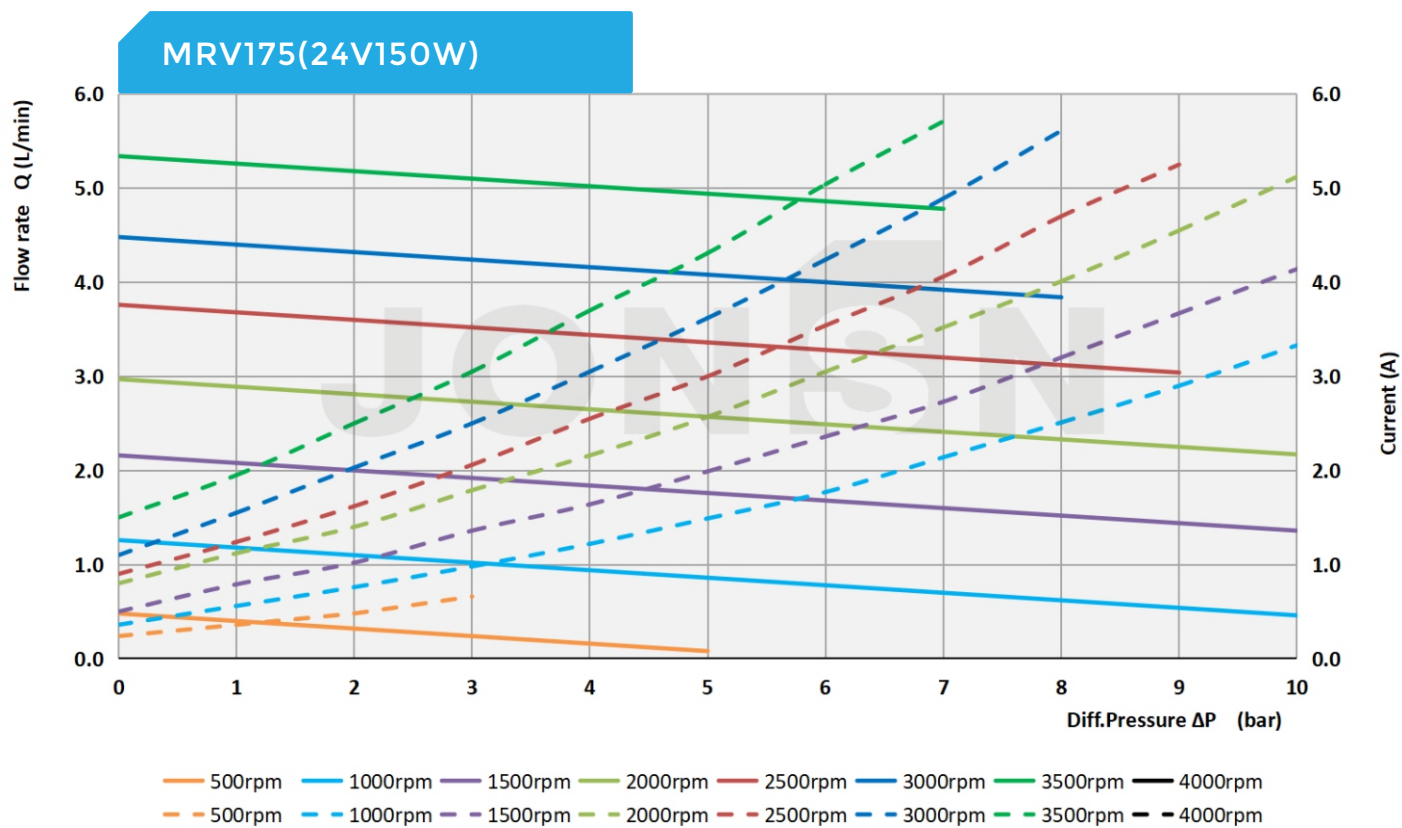
MRV + DC brushless motor

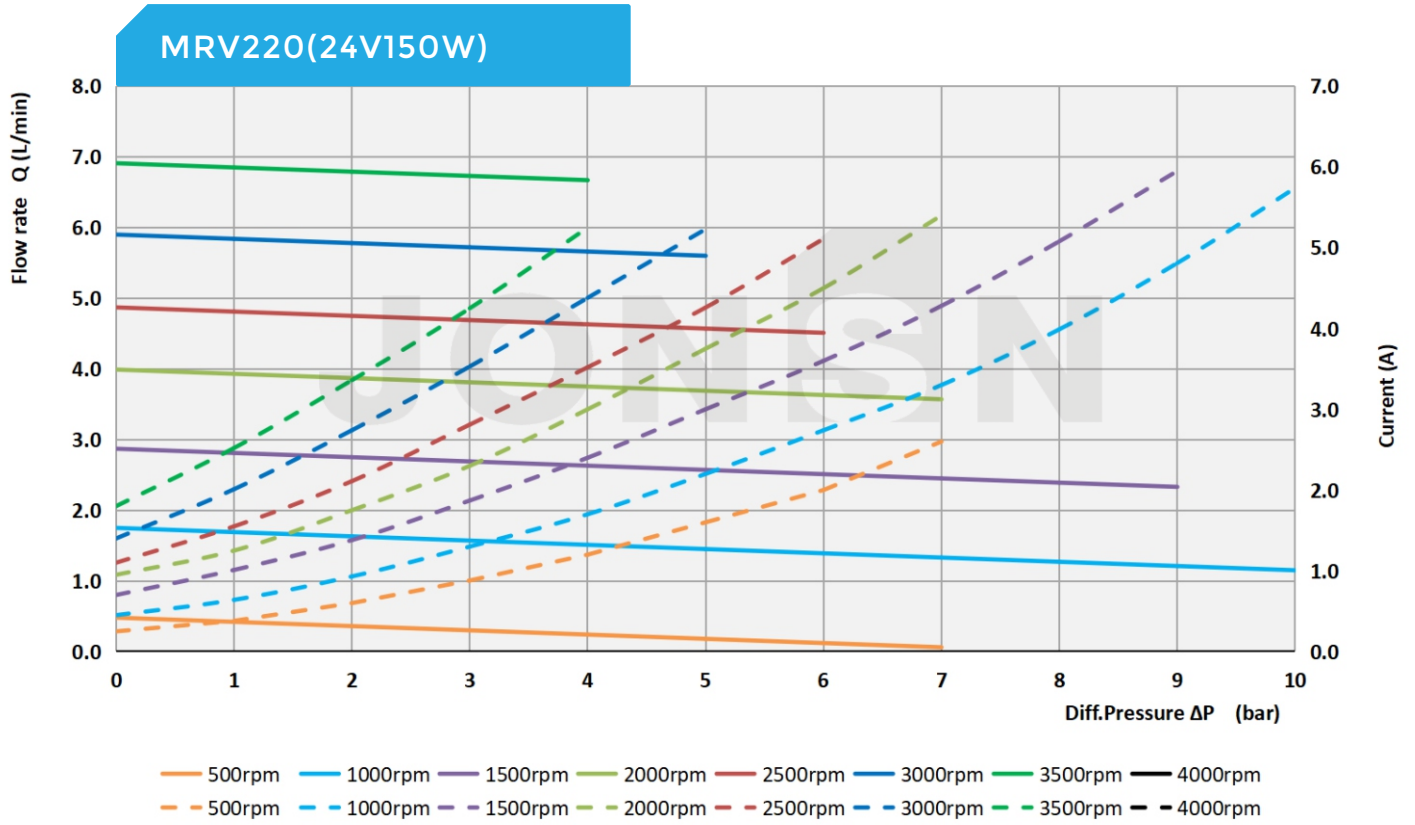


Pump Model	Brushless motor	
MRV125	150w/200w brushless motor	unified dimension
MRV175		
MRV220		











Attentively focus on producing each precision gear pump

■ **SHANGHAI JONSN FLUID EQUIPMENT CO.,LTD**

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Fax: 021-67689517

Website: www.jonsn.cn

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Economic Development Zone, Ganzhou City, Jiangxi Province