clark pumps, valves, and instrumentation solutions

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CONTENTS PUMPS

LIQUID PUMPS

DIAPHRAGM

PISTON-SOLENOID OPERATED

AIR OPERATED DIAPHRAGM

PERISTALTIC

clark pumps, valves, and instrumentation solutions

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CONTENTS PUMPS CONTINUED

TAKASAGO

MCP & PKP Series Inert Dispensing Pumps

Solenoid Operated, Dispensed Volumes From 1 to 500 µl

DESCRIPTION

Model MCP & PKP dispensing pumps have inert wetted parts and accurately dispense liquid media over an adjustable range of 1 to 500 micro liters.

The pumps utilize a solenoid operated piston with a spring return. The MCP-10 type pump is basically a two-way inert valve with one port plugged. The pumping funtion is like that of an eye dropper. The MCP-50 and the PKP type pump have opposing duck bill type check valves at the pump inlet and outlet that work with the piston movement for pumping action. The piston stroke can be field adjusted or factory set to deliver a prescribed volume with each solenoid actuation. The process media is isolated from the metal solenoid parts by an inert diaphragm.

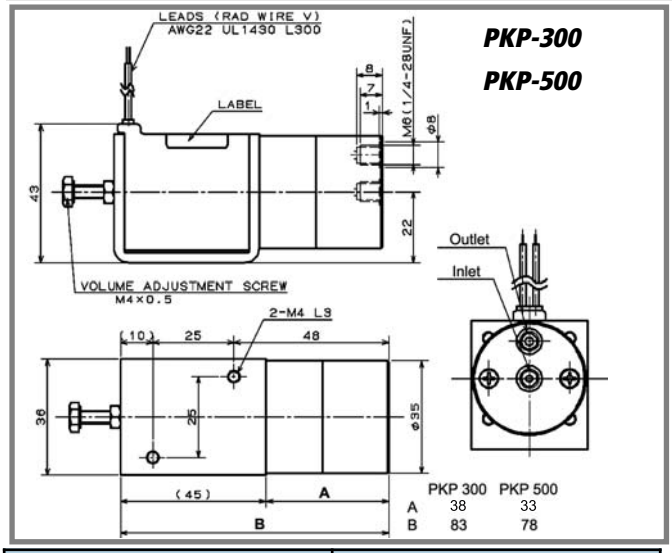
Model PKP 300 can pump a maximum of 300 micro liters per solenoid actuationand Model PKP-500 can pump 500 micro liters.

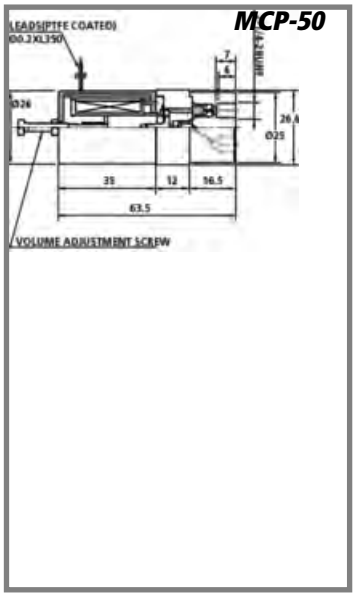
Model MCP-50

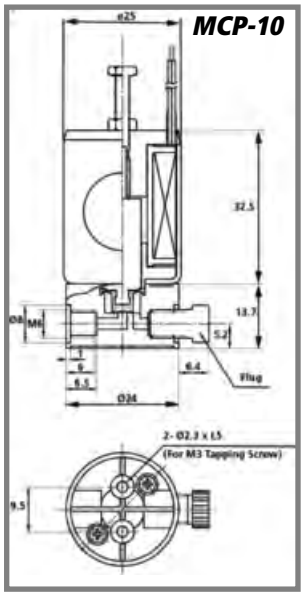
SPECIFICATIONS

Pump Model-	**MCP-10R**	**MCP-50**	**PKP-300PF**	**PKP-500P**
Rated Voltage-	5VDC,12Vdc , 24Vdc	12Vdc , 24Vdc	12Vdc , 24Vdc	12Vdc , 24Vdc
Power Consumption-	2.6w	4.4w	5.5w	5.5w
Max Pumped Volume/Actuation-	10µl	50µl	300µl	500µl
Adjustable Range-	1-10µl	5-50µl	10-300µl	50-500µl
Pumped Volume Accuracy-	-	±1% 15-50µl; ±2% 5-15µl	±1%	±1% 50-500µl; ±2% 10-50µl
Max Operating Frequency-	4Hz	4Hz	1Hz	2Hz
Fluid Connection-			1/4-28 thread or M6	
Media Temp Range-			10-40°C	
Ambient Temp Range-			10-40°C	
Insulation Class-	Class B	Class B	Class E	Class E
Insulation Resistance-			min 50Mohm at 500Vdc	
Dielectric Strength-			1500Vac/60 seconds	
Body Material-	PPS	PTFE,POM,PP	POM,PP	POM,PP
Isolation Diaphragm-			FPM	
Check Valves-	none	FPM	FPM	Silicone

Operating Notes, models MCP-50, PKP-300,500: 1) The pump duck bill type check valves open at very low differential presssure so the pump outlet must be mounted above the fluid reservoir to prevent siphoning. 2) The pump should be mounted horizontally with the base side down. 3) When the dispense volume is less than 250µl, purging air bubbles is more difficult. It is therefore advisable to prime the pump at max delivery before setting the desired dispense volume. Consult factory for effect of media temperature on output.







*Model	Description
MCP-50-12V-PTFE	5-50µL, 12VDC, PTFE BODY
MCP-50-24V-PTFE	5-50µL, 24VDC, PTFE BODY
PKP-500P-12V-PP	50-500µL, 12VDC, PP BODY
PKP-500P-24V-PP	50-500µL, 24VDC, PP BODY

***These items are typically available from stock. Please call us to discuss other models of interest in the specification table**

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BOXER

16K Series Diaphragm Pump

Liquid Flow Rate to 150 ml/min

DESCRIPTION

The 16K series is a miniature liquid diaphragm pump intended for wide range of applications such as medical diagnostics, pharmaceutical, food processing, ink jet printing and water treatment industires.

As standard the pump includes inlet pulsation chamber to ensure smooth liquid transfer.

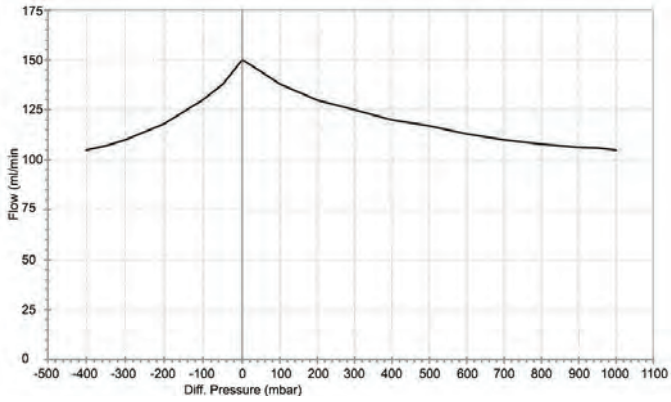
Motor options include iron core, coreless and BLDC (2 versions).

SPECIFICATIONS

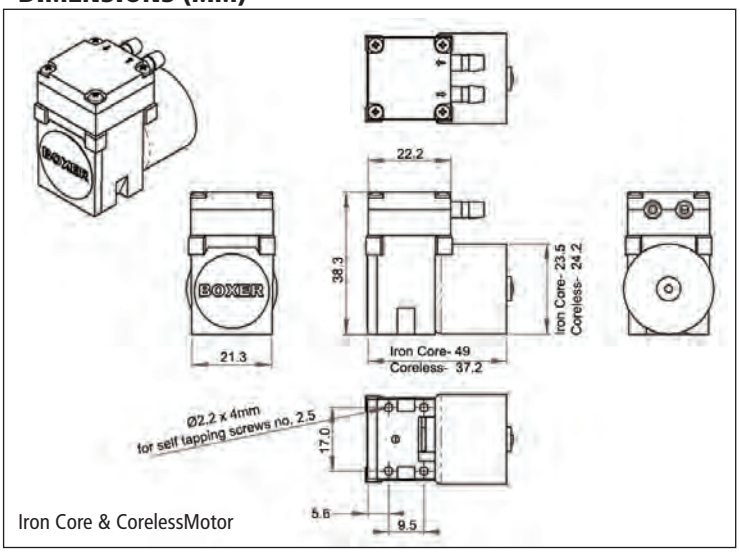
GENERAL

Free Flow: 150 ml/m
Max Pressure: 1.0 bar (14.5 PSI)
Max Vacuum: -400 mbar (11.8 inches Hg)
Motor:
  Iron Core Motor- 12 & 24 VDC
  Coreless Motor- 6 VDC
  Brushless- 24 VDC
Max. Operating Temp.: 50°C
Max Media Temp.: 100°C
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: EPDM
Valve Material: EPDM
Tubing Barb Size: 4.7 mm OD
Weight: Iron Core, 60g: Coreless, 65g; Brushless, 63g

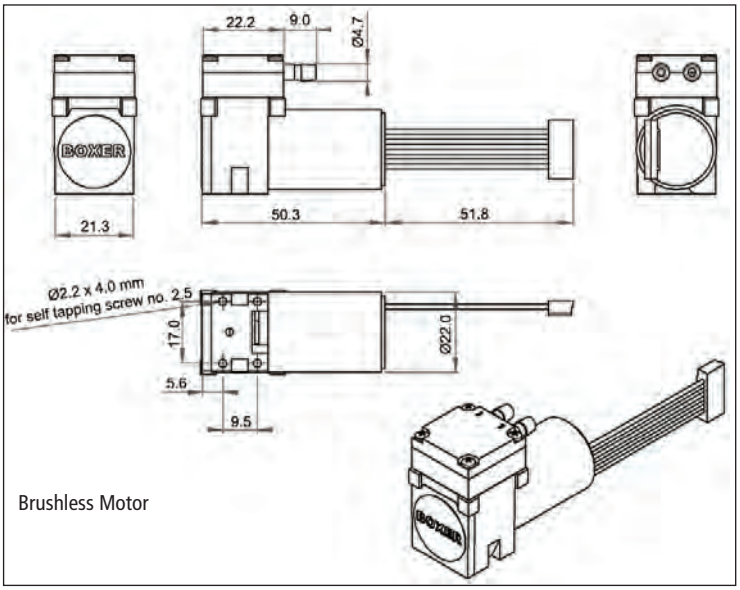
FLOW CURVE



DIMENSIONS (MM)



Iron Core & CorelessMotor



Brushless Motor

ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
16005.000	Iron Core	12	12
16006.000	Iron Core	24	24
16016.000	Coreless	6	12
16008.000	Brushless	24	24
6900.005	Brushless DC Driver Board		

Model 6900.005 Driver Board for Brushless Motors
The board is equipped with a trimmer which allows the regulation of the pump's speed i.e. flow.

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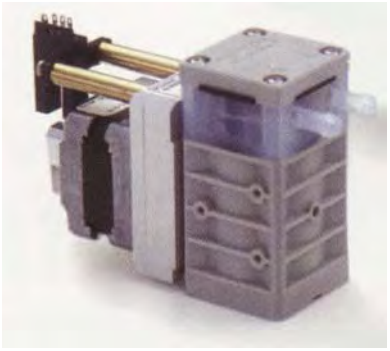
NAMIKI

Model 7039 & 7049 Miniature Diaphragm Liquid Pumps

Adjustable Flow, Vac. to 375 mm Hg, Pressure to 1.0 bar, Flow to 110 ml/min

DESCRIPTION



Models 7039 & 7049 liquid diaphragm pumps are an excellent choice where flow control, chemical resistance, plastic wetted components, DC power operation and quiet, reliable performance are required. They are typically used on medical equipment, laboratory automated chemistry applications, environmental sampling equipment and a range of industrial applications such as pick-and-place operations, ink jet printer systems and food packaging equipment.

Model 7039 & 7049 pumps incorporate a 24 V stepper motor and have a nominal delivery of 32 ml/min (0.32 ml/stroke) at 100 RPM. The motor shaft incorporates an eccentric that is attached to the pump diaphragm. Two opposing floating discs with seats respond to the diaphragm motion resulting in pumping action.

A driver circuit is offered as an option for driving the stepper motor. A photomicrosensor is also available for feedback based on the position of the diaphragm.

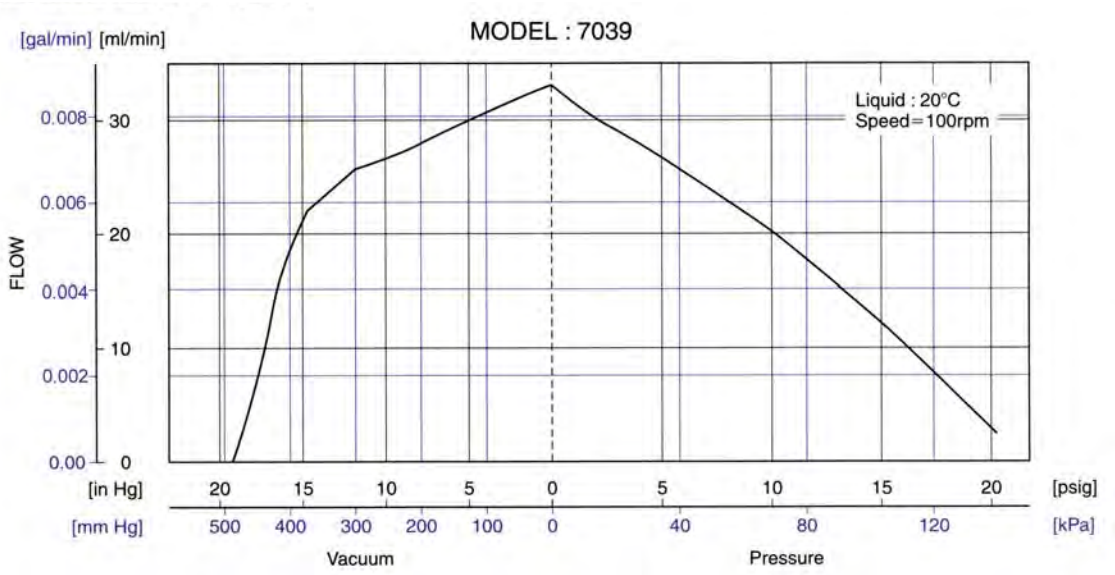
The pump is produced by Namiki Corporation, a world leader in DC motor production and technology.

SPECIFICATIONS

GENERAL

Ports: Hose nozzle (barb) for 3-4 mm I.D. tubing, 5 mm optional
Wetted Materials:
Pump Body: PFA
Diaphragm, Seal & Valve Material: *FKM Enhanced or PTFE-coated diaphragm, FFPM valves
*Proprietary fluro elastomer for improved chemical resistance (excellent for Ammonia, Methanol & Toluene)

Ambient & Fluid Temperature Range: 0 to 50°C
Exhaust Pressure Range: 0 to 1.0 bar (14.7 PSI)
Suction Pressure Range: 0 to -375 mm Hg
Nominal Voltage: 10.8 V
Motor: 3-Phase stepper motor
Step: 1.2°/step
Nominal Speed: 100 (full step) RPM
Flow Rate at Nominal Speed: 32 ml/min
Nominal Current Consumption: 0.3 A/phase
Pull-in Rate: Over 900 (full step) pps
Pull-out Rate: Under 1100 (full step) pps
Weight: 280g



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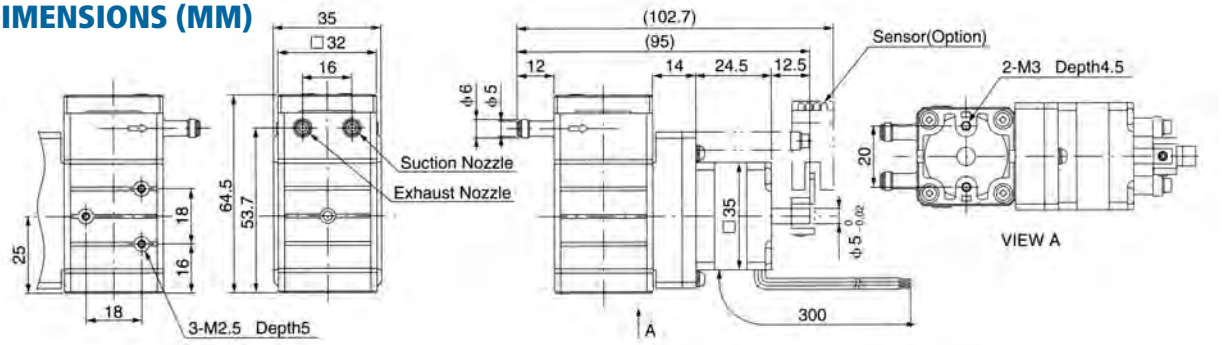
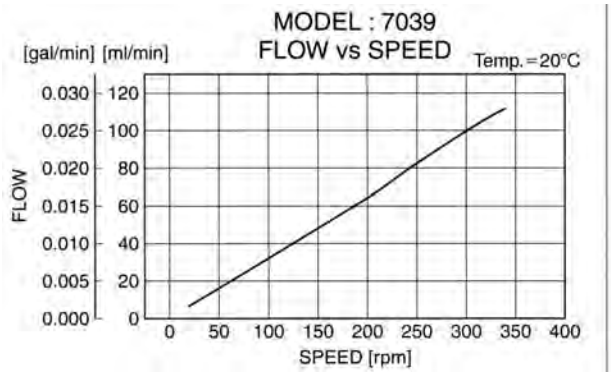
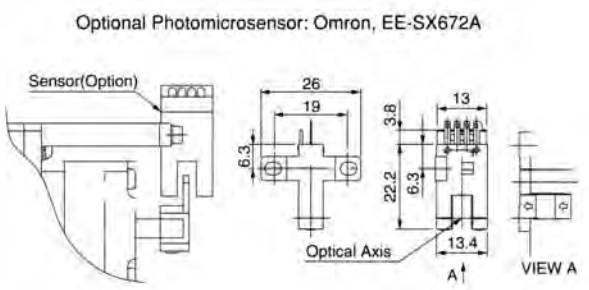
DIMENSIONS (MM)

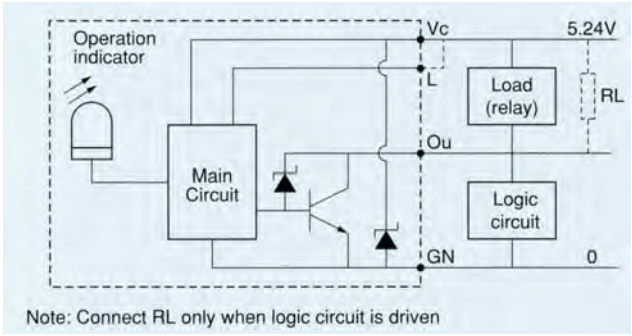


FLOW/SPEED CHARACTERISTICS



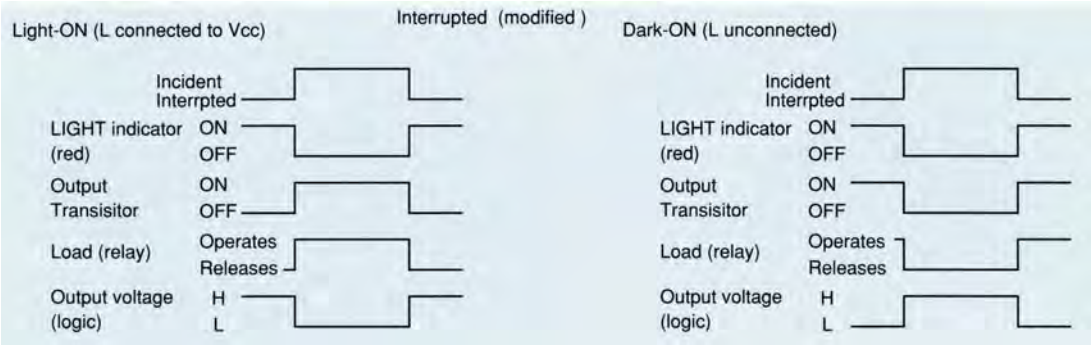


PHOTOMICROSENSOR OUTPUT CIRCUIT (NPN)



Supply Voltage: 5 to 24 V
Current Consumption: 35 mA
Max Load Current: 100 mA
Max Frequency: 1 kHz
Electrical:
Pin 1- Vcc
Pin 2- L
Pin 3- Output

PHOTOMICROSENSOR TIMING CHART



ORDERING INFORMATION

Model Number	7039D	**7039S**	**7039SD**	7049	7049D	7049S	7049SD
Diaphragm, Seal & Valves	FKM	FKM	FKM	PTFE	PTFE	PTFE	PTFE
Photo Sensor	W/O	With	With	W/O	W/O	With	With
7039 Driver	With	W/O	With	W/O	With	W/O	With

Bold Items Typically Ship From Stock

Optional 7039 Stepping Motor Driver

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GOTEC

EDS 035 Miniature Diaphragm Pump

Solenoid Operated, Flow to 117 ml/min, Pressure to 0.3 Bar (4.35 PSI)

DESCRIPTION

Model EDS 035 pump is ideally suited for transfer of compatible liquid media at low pressures and flow rates.

The pump operation is straight forward with a solenoid moving a diaphragm within a plastic housing that has opposing duckbill check valves mounted in the pump inlet and outlet. The diaphragm and check valve material is EPDM. Inlet and outlet connections are barbed hose type and the pump housing rotates to best orient the barbs to the most suitable mounting position.

The pump is useful for many fluid transfer applications in equipment for HVAC, Medical, Automated Chemistry, and General Automation Applications.

FEATURES

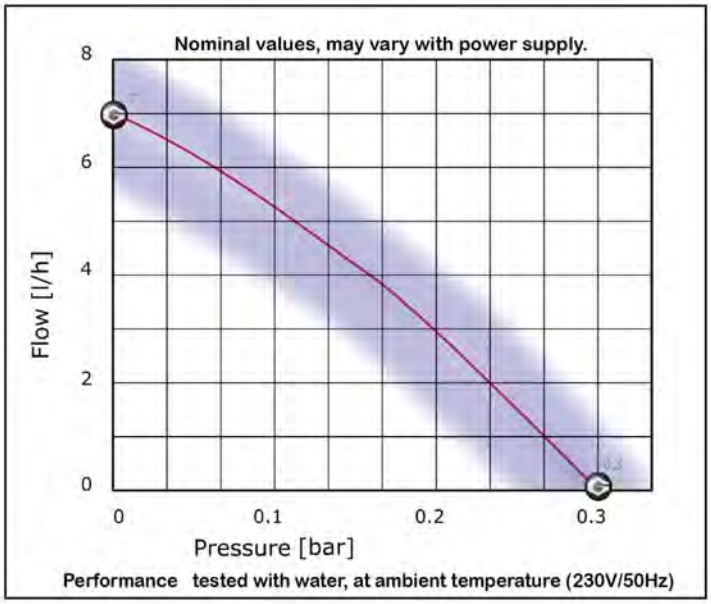
- o Inert Wetted Parts
- o Simple Opposing Check Valve Operation
- o Small Size
- o Easy Mounting
- o Rated for Continuous Duty
- o Low Power Consumption

SPECIFICATIONS

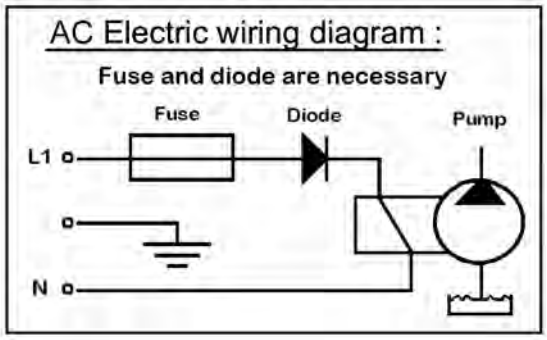
GENERAL

Maximum Pressure- 0.3 Bar (4.35 PSI)
Maximum Flow Rate- 117 ml/min (1.54 GPH)
Maximum Suction- 4.9 feet
Viscosity Range- 1...600 mm^2/s
Filter- 100 Mesh
Supply Voltage- 12, 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz
DC Operation: Optional model PD-106 DC driver board
Power Consumption- 18 W
Operating Factor- 100% continuous duty@20°C
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)
Dimensions- See Dimension Drawing
Pump Housing Material- PVDF (wetted) and PEEK (non-wetted)
Electrical Connections- Male DIN Spade (3 x 6.3 mm x .08 mm), ISO/DIN 43650 form B, or 130 mm flying leads
Insulation: Class F-100% ED / 20 [°C] with heat sink (Class H on request), Class I
Piping Connections- 1/4 " O.D. Barb
Optional Mounting- Integral Heat Sink w/2ea 1/8" Holes 3/4" on center (see drawing)
Weight- 90 g

FLOW CURVE



ELECTRICAL



Above items typically ship from stock

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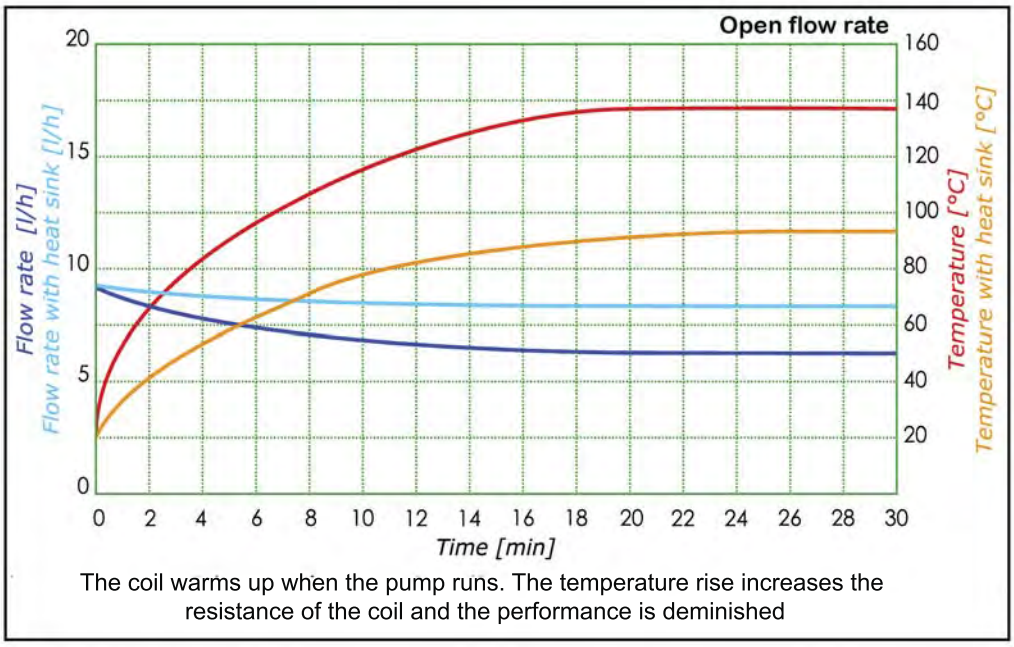
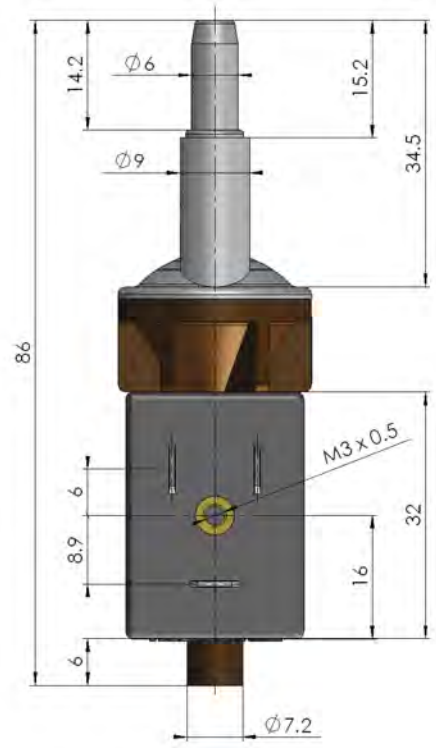
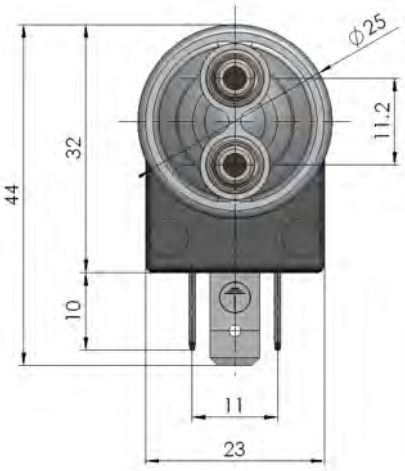
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



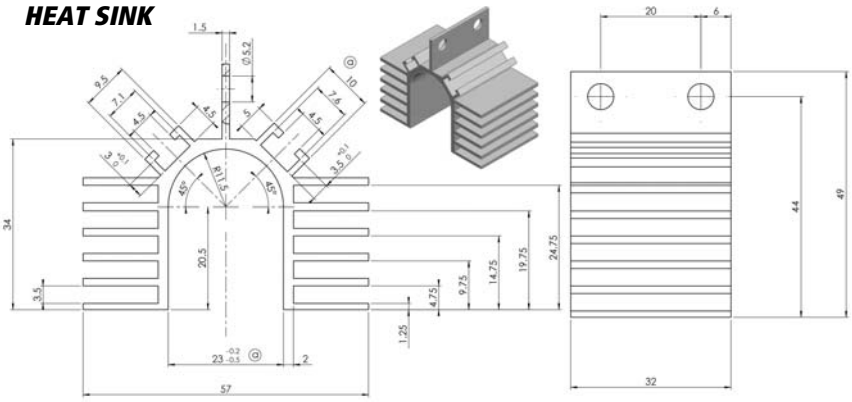
The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is deminished

DIMENSIONS (MM)





HEAT SINK



ORDERING INFORMATION

ORDER NUMBER

EDS-035-24V: Pump With 24V Solenoid
EDS-035-110V: Pump With 110V Solenoid

Options:
Model 106628- Heat Sink
Model 1N5406- Diode
Model PD-106- DC driver board, 9-35 VDC in, 9-35V pulsed DC out

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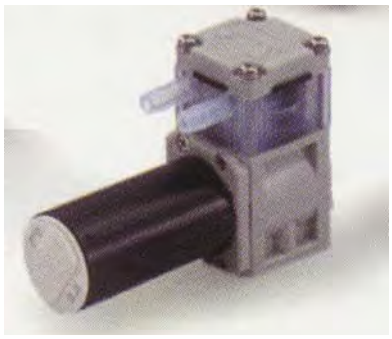
NAMIKI

Series 5000 Miniature Diaphragm Liquid Pumps

Chemically Resistant, Vac. to 225 mm Hg, Pressure to 0.7 bar, Flow to 190 ml/min

DESCRIPTION



Series 5000 liquid diaphragm pumps are an excellent choice where chemical resistance, plastic wetted components, DC power operation and quiet, reliable performance are required. They are typically used on medical equipment, laboratory automated chemistry applications, environmental sampling equipment and a range of industrial applications such as pick-and-place operations, ink jet printer systems and food packaging equipment.

Series 5000 pumps incorporate a 12 V or 24 V Namiki coreless DC motor. The motor shaft incorporates an eccentric that is attached to the pump diaphragm. Two opposing floating discs with seats respond to the diaphragm motion resulting in pumping action.

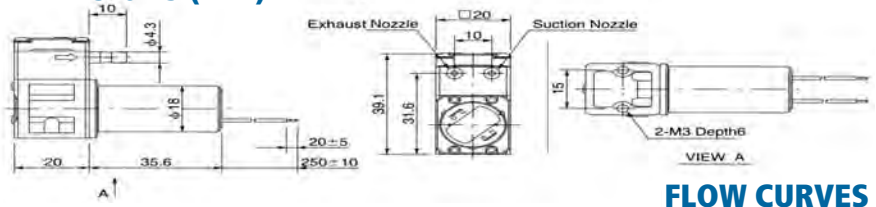
The pumps are produced by Namiki Corporation, a world leader in DC motor production and technology.

SPECIFICATIONS

GENERAL

Ports: Hose nozzle (barb) for 3-4 mm I.D. tubing, 5 mm optional
Wetted Materials:
Pump Body: PFA
Diaphragm, Seal & Valve Material: FKM, *FKM Enhanced or PTFE-coated diaphragm, FFPM valves
*Proprietary fluro elastomer for improved chemical resistance (use for Ammonia, Methanol & Toluene)
Non-Wetted Pump Housing Material: POM
Ambient & Fluid Temperature Range: 0 to 50°C
Maximum Flow Rate: 12 VDC, 180 ml/min; 24 VDC, 190 ml/min
Exhaust Pressure Range: 0 to 0.7 bar (10.1 PSI)
Suction Pressure Range: 0 to -225 mm Hg
Motor: Namiki 12VDC or 24VDC Coreless
Brush Type: Graphite
Nominal Current Consumption: 12 Vdc, 190 mA; 24 VDC, 110 mA
Weight: 77g

DIMENSIONS (MM)



ORDERING INFORMATION

ORDER NUMBER (SEE TABLE)

ABC

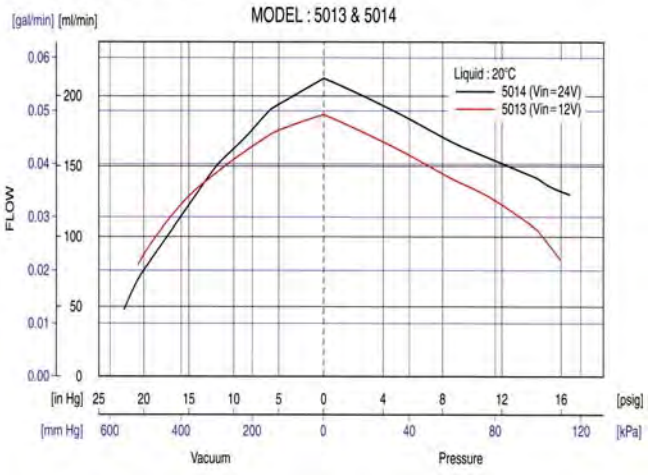
EXAMPLE: 5013

A Model	B Diaphragm, Valves & Seals	C Motor
50	1= FKM 3= FKM Enhanced 4= PTFE-Coated Diaphragm,	3= Coreless Motor 12V 4= Coreless Motor 24V

Above Order Combinations Typically Ship From Stock

Please call us to discuss any special wetted material requirements or additional requirements.

FLOW CURVES



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NAMIKI

Model 7008 Miniature Diaphragm Liquid Pumps

Chemically Resistant, Vac. to 375 mm Hg, Pressure to 1.0 bar, Flow to 630 ml/min

DESCRIPTION

Model 7008 liquid diaphragm pump is an excellent choice where chemical resistance, plastic wetted components, DC power operation and quiet, reliable performance are required. It is typically used on medical eqipment, laboratory automated chemistry applications, environmental sampling equipment and a range of industrial applications such as pick-and-place operations, ink jet printer systems and food packaging equipment.

Model 7008 pump incorporates a 24 V Namiki brushless DC motor with integrated sensor drive type circuit. The motor shaft incorporates an eccentric that is attached to the pump diaphragm. Two opposing floating discs with seats respond to the diaphragm motion resulting in pumping action.

The pump is produced by Namiki Corporation, a world leader in DC motor production and technology.

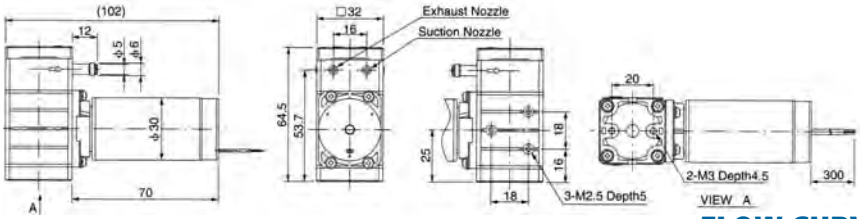
SPECIFICATIONS

GENERAL

Wetted Materials:
- Pump Body: PFA
- Diaphragm, Seal & Valve Material: *FKM Enhanced or PTFE-coated diaphragm, FFPM valves
  *Proprietary fluro elastomer for improved chemical resistance (excellent for Ammonia, Methanol & Toluene)

Ports: Hose nozzle (barb) for 3-4 mm I.D. tubing, 5 mm optional
Non-Wetted Pump Housing Material: POM
Ambient & Fluid Temperature Range: 0 to 50°C
Maximum Flow Rate: 630 ml/min
Exhaust Pressure Range: 0 to 1.0 bar (14.5 PSI)
Suction Pressure Range: 0 to -375 mm Hg
Motor: Namiki 24VDC brushless with integrated sensor drive circuit type
Nominal Current Consumption: 370 mA
Weight: 280g

DIMENSIONS (MM)



ORDERING INFORMATION

ORDER NUMBER (SEE TABLE)

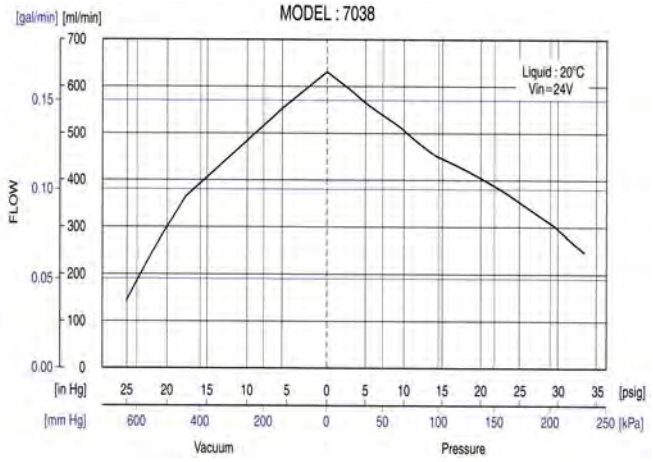
ABC

EXAMPLE: 7038

A Model	B Diaphragm, Valves & Seals	C Motor
70	3= FKM Enhanced 4= PTFE-coated diaphragm, FFPM valves	8= Brushless Motor, 24V

Please call us to discuss any special wetted material requirements or additional requirements.

FLOW CURVES



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BOXER

19KL Series Diaphragm Pump

Liquid Flow Rate to 0.8 l/m

DESCRIPTION

The 19KL series single headed liquid diaphragm pump offers a
combination of high pneumatic performance and damping chambers to reduce pulsation. The 19KL a very versatile pump suitable for wide range of applications.

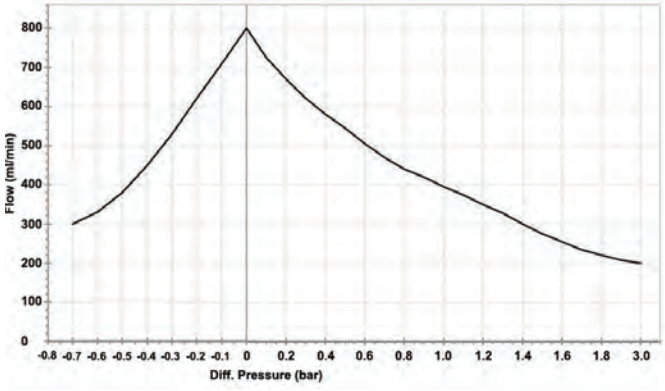
Both brushed and brushless motor options are available.

SPECIFICATIONS

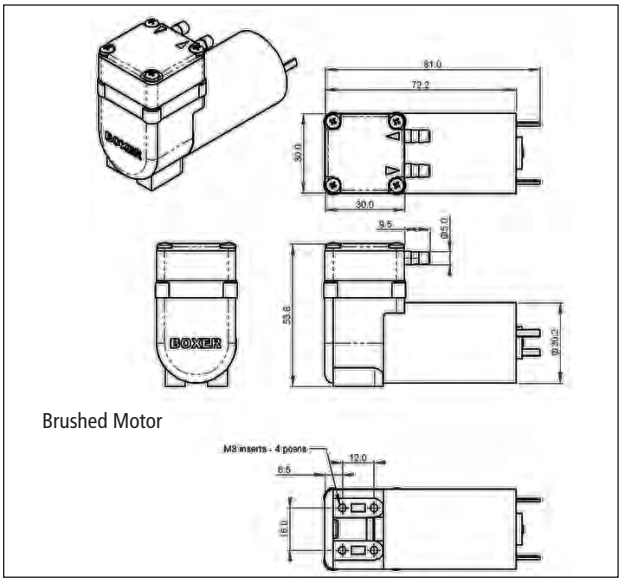
GENERAL

Free Flow: 0.8 l/m at 2300 rpm
Max Pressure: 2 bars (29 PSI)
Max Vacuum: -700 mbars (20.7 inches mercury)
Motor:
  Brushed Motor- 12 & 24 VDC
  Brushless Motor- 24 VDC
Max. Operating Temp.: 50°C
Max Media Temp.: 100°C
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: EPDM
Valve Material: EPDM
Tubing Barb Size: 5 mm OD
Weight; 173g

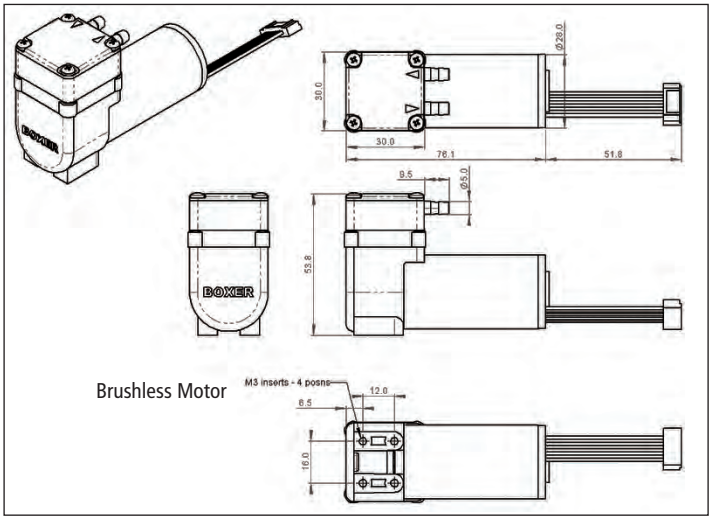
FLOW CURVE



DIMENSIONS (MM)



Brushed Motor



Brushless Motor

ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
19201.001	Brushed Motor	12	12
19201.002	Brushed Motor	24	24
19201.601	Brushless Motor	24	24
6900.005	Driver Board for Brushless motors		

Model 6900.005 Driver Board for Brushless Motors
The board is equipped with a trimmer which allows the regulation of the pump's speed i.e. flow.

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BOXER
10KDL Series Diaphragm Pump
Liquid Flow Rate to 1 l/m

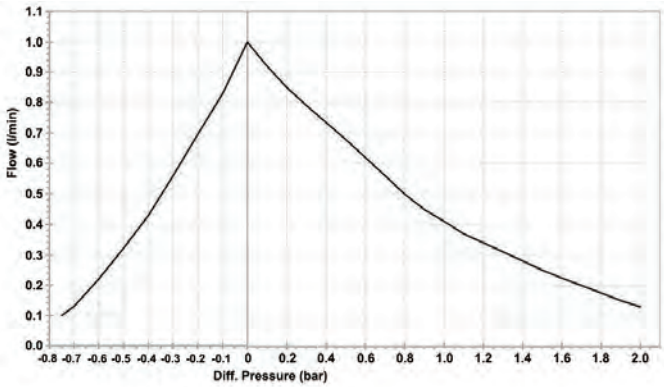
DESCRIPTION
The 10KDL series double headed liquid diaphragm pumps are compact and versatile. High performance engineering plastics and elastomers allow use in high temperature applications. Two pump heads 180° out-of-phase minimize pulsation compared to a single headed pump.

This series is offered with brushed and BLDC motors. An encoder option available for rpm feedback.

SPECIFICATIONS

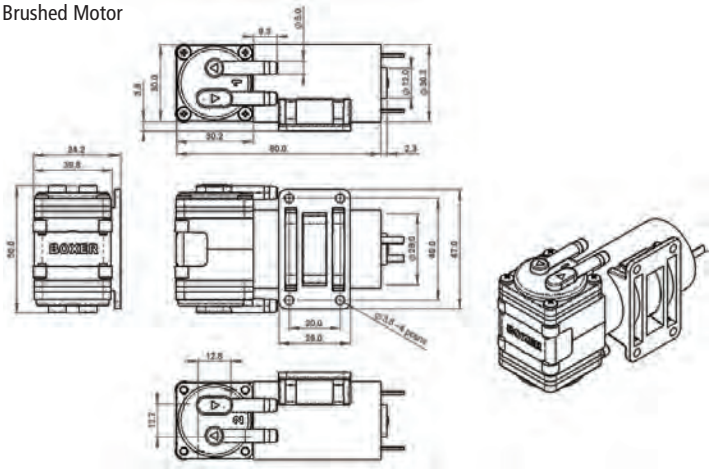
GENERAL
Free Flow: 1 l/m
Max Pressure: 2 bar (29 PSI)
Max Vacuum: -750 mbar (22.1 in. Hg)
Motor:
  Brushed Motor- 12 & 24 VDC
  Brushless Motor- 24 VDC
Max. Operating Temp.: 50°C
Max Media Temp.: 100°C
Housing Material: PPS (Polyphenylene Sulfide
Diaphragm Material: Nitrile
Valve Material: Silicone
Tubing Barb Size: 5 mm OD
Mounting Bracket: Included

FLOW CURVE

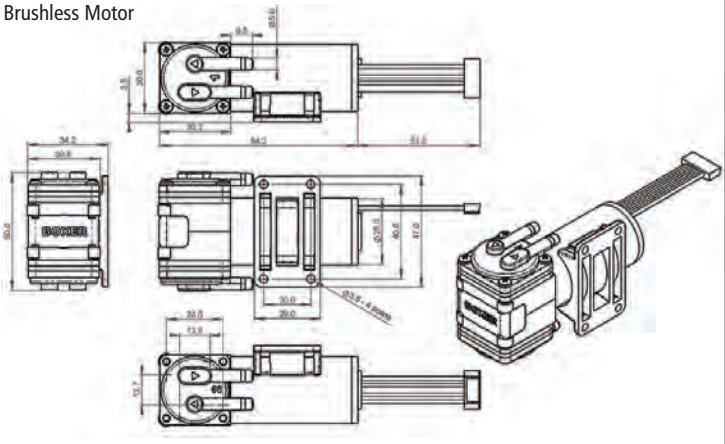


DIMENSIONS (MM)

Brushed Motor



Brushless Motor



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
10202.001	Brushed Motor	12	12
10202.002	Brushed Motor	24	24
10202.601	Brushless Motor	24	24
6900.005	Driver Board for Brushless motors		

Model 6900.005 Driver Board for Brushless Motors
The board is equipped with a trimmer which allows the regulation of the pump's speed i.e. flo .

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BOXER
3KL Series Diaphragm Pump
Liquid Flow Rate to 1.5 l/m

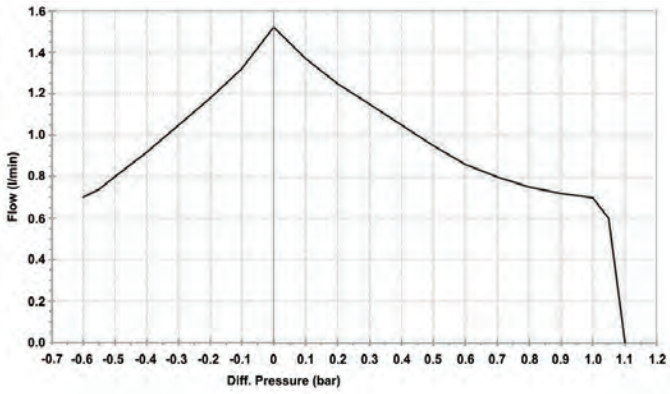
DESCRIPTION
The 3KL series is an extremely compact, robust and versatile single headed liquid diaphragm pump. High quality connection rod and motor bearings combined with slow speed contribute to maximum operational life. The pumps feature a detachable motor.

This 3KL series is offered with 2 different brushed motors.

SPECIFICATIONS

GENERAL
Free Flow: 1.5 l/m
Max Pressure: 1.1 bar (16 PSI)
Max Vacuum: -600 mbar (17.7 in. Hg)
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: Suitable for 6MM ID tubing
Weight; 377g

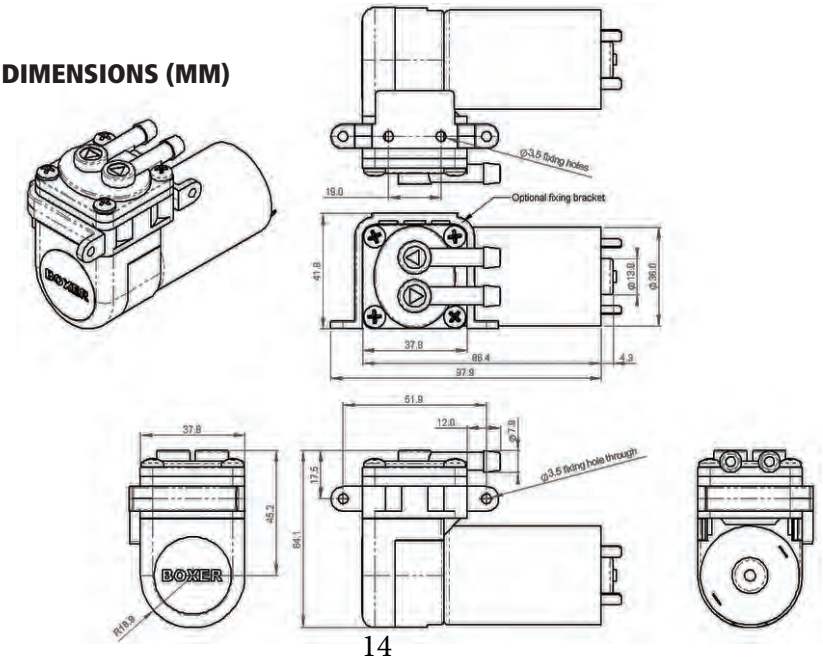
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3211.509	Brushed- Economic	12	12
3211.510	Brushed- Economic	24	12
3211.129	Brushed	12	24
3211.252	Brushed	24	6

DIMENSIONS (MM)



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BOXER

3MD Series Diaphragm Pump

Liquid Flow Rate to 2.5 l/m

DESCRIPTION

The 3MD series double headed liquid diaphragm pumps have a unique design and high performance to size ratio. This series additionally offers a unique detachable motor construction allowing contaminated heads to be ecconomically exchanged.

Brushed DC motor options are offered in this series.

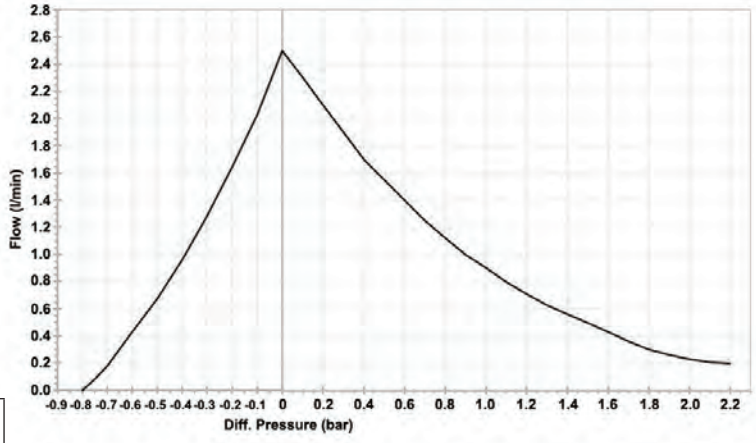
Like all other pumps in the Boxer range, this series can be customized to specific OEM requirements.

SPECIFICATIONS

GENERAL

Free Flow: 2.5 l/m
Max Pressure: 2.2 bar (31.9 PSI)
Max Vacuum: -800 mbar (23.6 in. Hg)
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 7.8MM
Mounting Brackets: Supplied
Weight; 433g

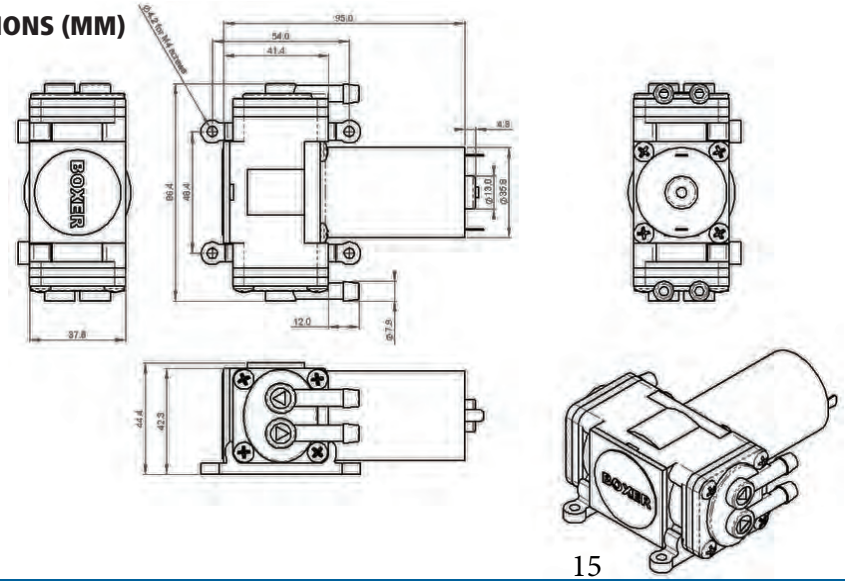
FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3232.508	Brushed- Economical	12	24
3232.509	Brushed- Economical	24	48
3232.129	Brushed	12	24
3232.252	Brushed	24	48

DIMENSIONS (MM)



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BOXER

3MQ Series Diaphragm Pump

Liquid Flow Rate to 4.6 l/m

DESCRIPTION

The 3MQ series quad headed liquid diaphragm pumps have a unique design and high performance to size ratio. This series additionally offers a unique detachable motor construction allowing contaminated heads to be ecconomically exchanged.

Brushed DC motor options are offered in this series.

Like all other pumps in the Boxer range, this series can be customized to specific OEM requirements.

SPECIFICATIONS

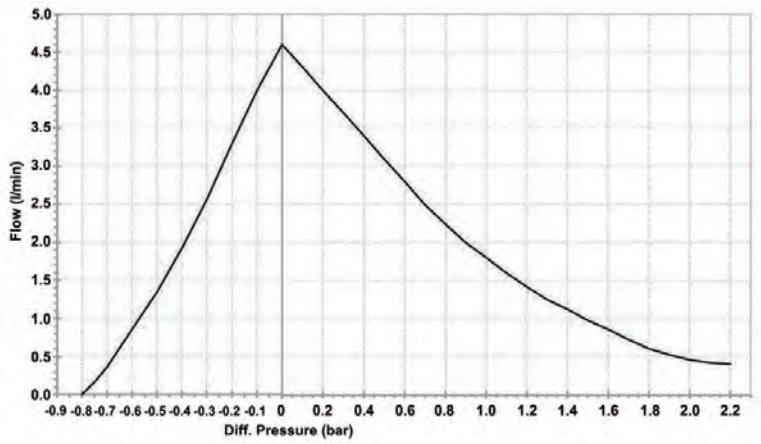
GENERAL

Free Flow: 4.6 l/m
Max Pressure: 2.2 bar (29 PSI)
Max Vacuum: -800 mbar (23.6 in. Hg)
Max. Ambient Temp: 50°C
Max Media Temp.: 100°C
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 7.9 MM OD
Mounting Brackets: Supplied

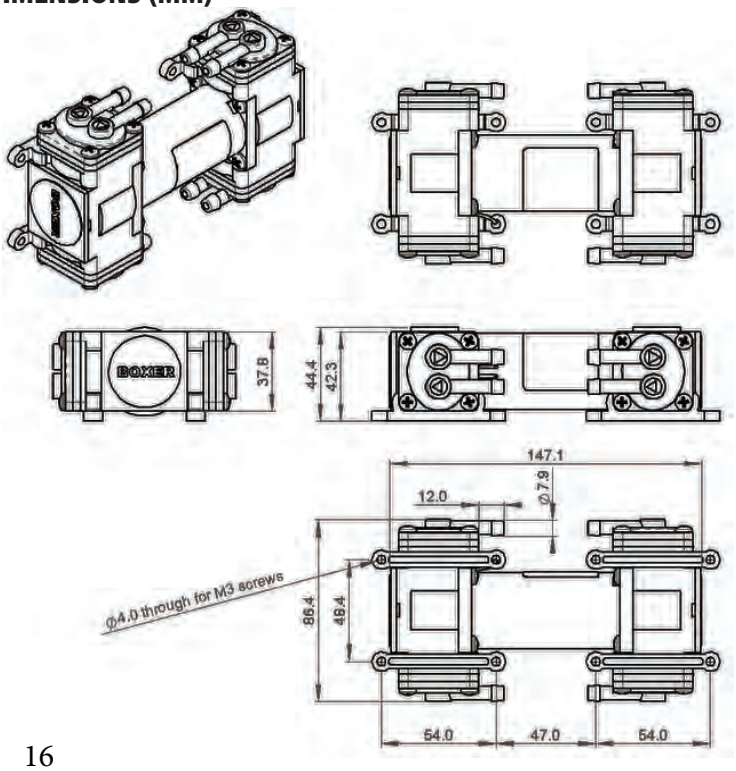
ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3234.129	Brushed	12	12
3234.252	Brushed	24	24

FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



DIMENSIONS (MM)



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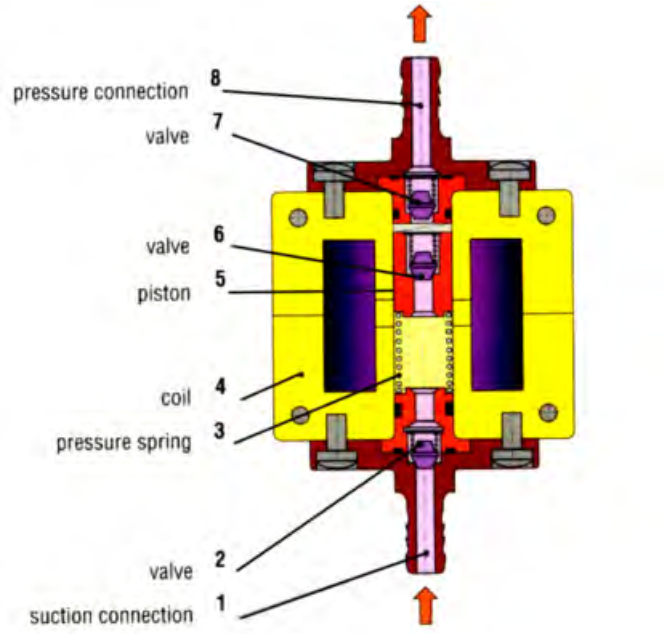
GOTEC

Oscillating Piston Pumps

General Principle Of Operation

DESCRIPTION

The piston (5) is moved by the electromagnetic field generated by the single wave diode rectified current flowing through the coil (4). Each current pulse moves the piston against the pressure spring (3). This movement, by reducing the volume in the suction chamber, opens the valve (6) set in the piston to let the liquid run into the pressure side. When the current pulse dies the pressure spring pushes back the piston toward the pressure side. The increase of pressure closes the piston valve and the liquid flows through the valve (7) set in the pressure connection (8) and into the pressure pipe. This movement creates a low pressure in the suction chamber which opens the valve (2) set in the suction connection (1). The liquid is sucked into the pump and the cycle starts again, 60 times per second (at 60 Hz).
The piston size and the length of its displacement define the flow rate. The pressure limits itself automatically. The pump will run without damage when the liquid flow is stopped momentarily.
The pumps are typically powered with 120 VAC or 24 VAC 50/60 HZ. Alternatively, for flow control, pulse width and frequency modulation drive circuits can be used.
Precision components, piston and bushings, guarantee minimum wear and long life.
By offering many combinations of materials, our pumps will handle a broad range of media and temperatures.



TYPICAL APPLICATIONS

Air Conditioning Systems, Fuel Oil Transfer, Boiler Cleaning, Water Cleaning Equipment, Carpet Cleaning Equipment, Heat Treatment Equipment, Accumulators, Vending Machines (for soft drinks), Analytical Chemical Analyzers, Diagnostic Systems, Plotting Systems, Technical Equipment .....

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GOTEC

ESX-04 Miniature Piston Pump

Solenoid Operated, Flow Rates to 5 L/H (1.32 GPH), Pressure to 0.3 Bar (4.35 PSI)

DESCRIPTION

Model ESX 04 oscillating piston pump is a great solution for low volume liquid pumping applications where small size is a critical factor. All material in contact with fluid media is stainless steel or EPDM.

The pump is self priming.

ESX-04

SPECIFICATIONS

GENERAL

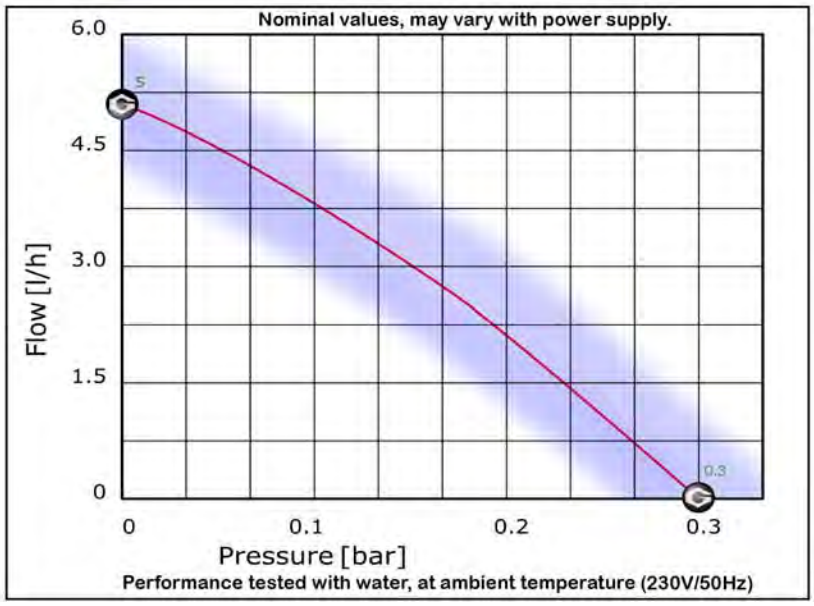
Pump Housing & Piston- AISI 431 SS
Spring- AISI 316 SS
Duckbill Valves- EPDM
Solenoid Housing- Molded Epoxy
Maximum Pressure- 0.3 Bar (4.35 PSI)
Maximum Flow- 5 l/h (1.32 GPH)
Suction Height- 0.3 meters (.984 ft)
Viscosity Range- 1-600 mm^2/s
Particle Tolerance- 100 Mesh
Supply Voltage- 12, 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz
DC Operation- Optional model PD-106 DC driver board
Electrical Connections- Male DIN Spade (3 x 6.3 mm x .08 mm), ISO/DIN 43650 form B, or 130 mm flying leads
Power Consumption- 5 W
Operating Factor- 100% continuous @ 68°F

FEATURES

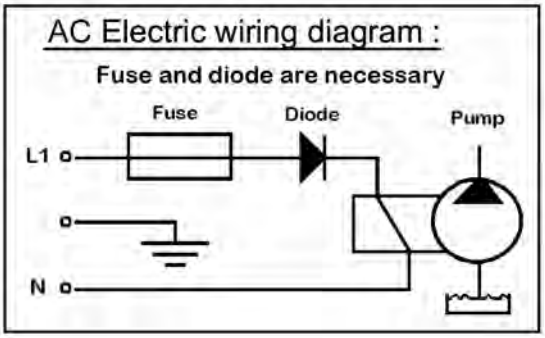
- o Small Size
- o Rated for Continuous Duty
- o Low Power Consumption

Insulation: Class F-100% ED / 20 [°C], Class 1
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)
Dimensions- See dimension drawing
Piping Connections- 7 mm (1/4 " O.D.) hose barb
Weight- 35g

FLOW CURVE



ELECTRICAL



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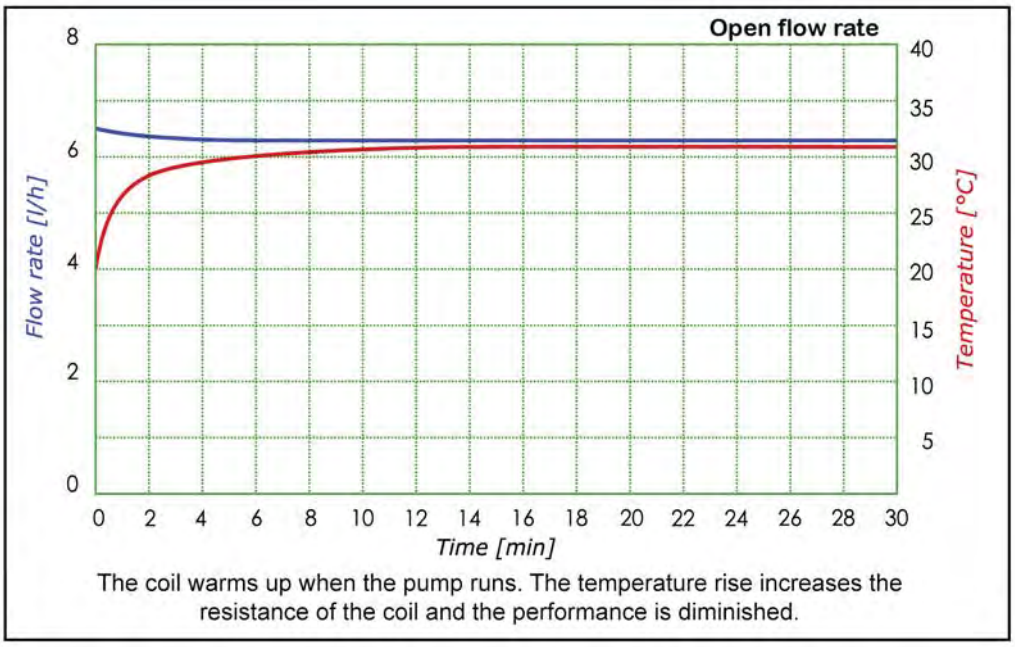
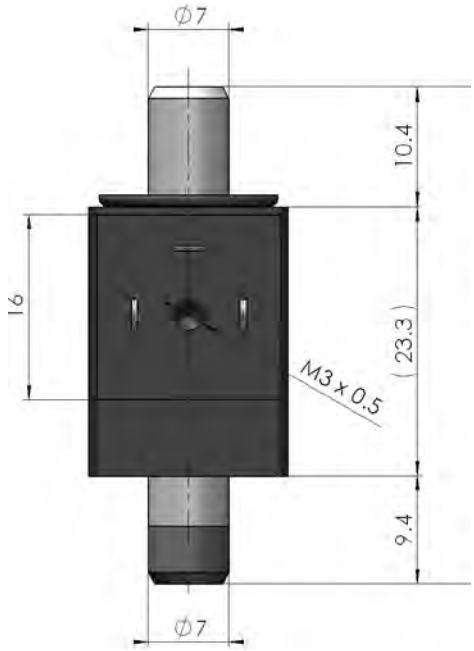
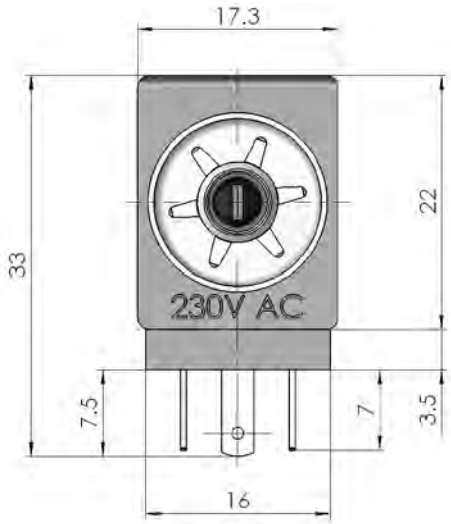
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

DIMENSIONS (MM)





ORDERING INFORMATION

1/4" BARBED HOSE CONNECTIONS

ABC (ESX0424VS)

A Model	B Voltage	C Elec. Conn.
ESX04	24V=24V 110=110V 12V=12V 230V=230V	S = DIN Spade L = Flying Leads 130mm

Options:
Model 1N5406- Diode
Model PD-106- DC driver board, 9-35 VDC in, 9-35V pulsed DC out

Special materials and connections are available in OEM quantities. Please consult with us.

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GOTEC

EMX-08 Miniature Piston Pump

Solenoid Operated, Flow to 20 L/H (5.28 GPH)
Pressure to 0.8 Bar (11.6 PSI)

DESCRIPTION

Model EMX08 and EMX08-BD oscillating piston pump are a great solution for low volume liquid pumping applications where small size is a critical factor.

The piston size and the length of its displacement define the flow rate. The pressure limits itself automatically. The pump will run without damage when the liquid flow is stopped momentarily.

Model EMX-08 and EMX08-BD are offered with two or three valves depending on the inlet suction required.

The precision ground machined elements, piston and bushing, guarantee minimum wear and exceptional component life. With only stainless steel and PTFE in contact with the media, the pumps are suitable for a wide range of fluids and applications.

SPECIFICATIONS

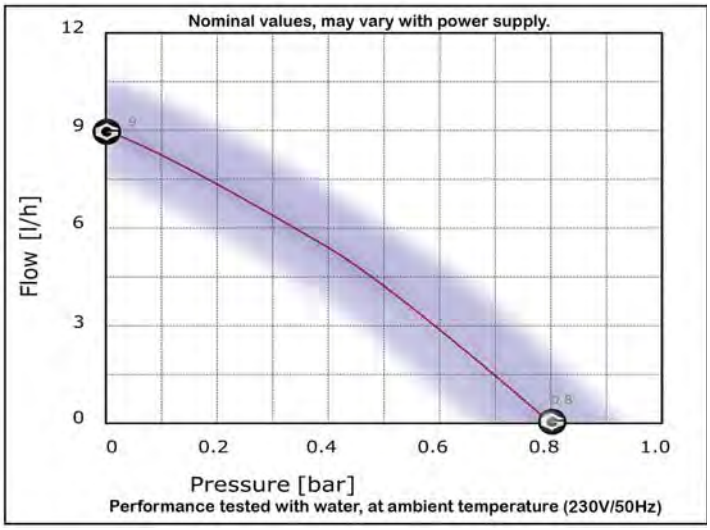
GENERAL

Supply Voltage- 12, 24, 110, 230VAC, diode rectified
Pump Materials-303, 304, 316, & 431 SS
Pump Seal Material- PTFE or NBR
Solenoid Housing- Molded epoxy
Maximum Pressure- 0.8 bar (11.6 PSI)
Maximum Flow- Standard Vers., 9 L/H (2.38 GPH)
BG Vers., 20 L/H (5.28 GPH)
Suction Height- 2 Valves:5ft
3Valves:10 ft
Viscosity Range- 1....600mm^2/s
Particle Tolerance- 100 mesh
Frequency- 50/60 Hz

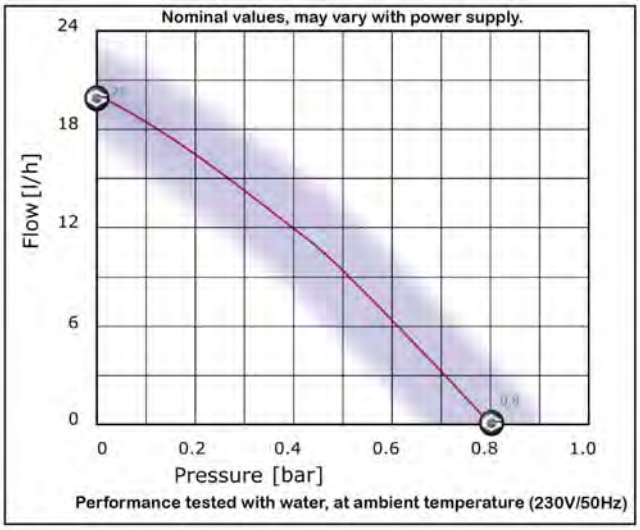
DC Operation: Optional model PD-106 DC driver board
Electrical Connections- Male DIN Spade (3 x 6.3 mm x .08 mm), ISO/DIN 43650 form B, or 130 mm flying leads
Power Consumption- 18 W
Insulation: Class F-100% ED / 20 [°C] with heat sink (Class H on request), Class I
Operating Factor- 100% continuous@ 68°F
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)
Noise level (1m): open flow = ~35 [dB(A)],
Max. pressure = ~29 [dB(A)]
Optional Mounting- Integral Heat Sink w/2ea 1/8" Holes 3/4" on center (see drawing)
Weight- 95 g (0.2 lb)

FLOW CURVES

EMX08



EMX08-BD



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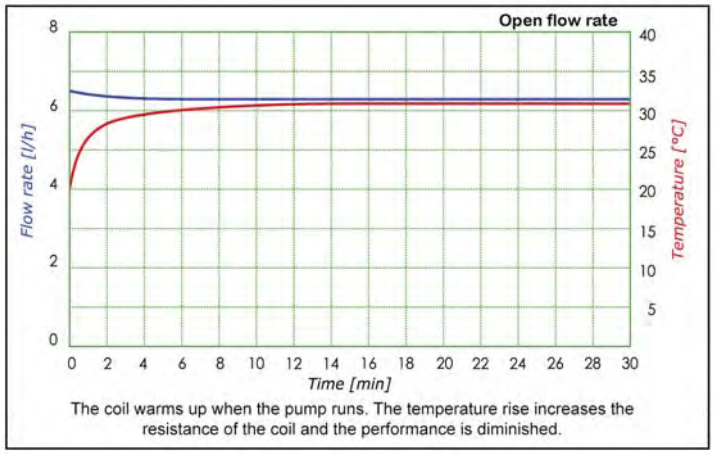
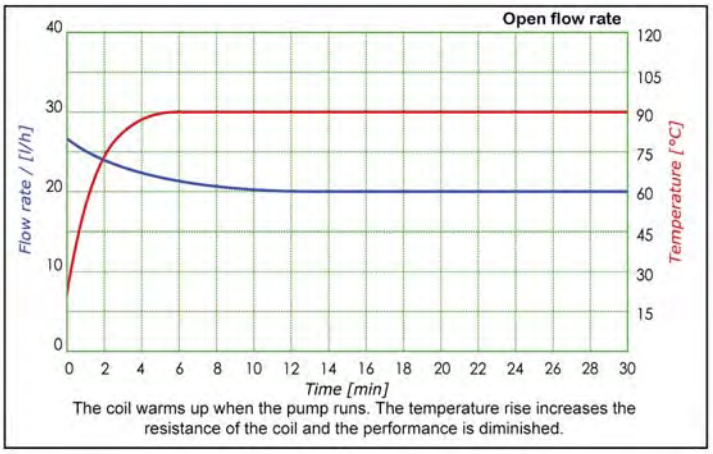
EFFECT OF COIL TEMPERATURE RISE ON FLOW

EMX-08



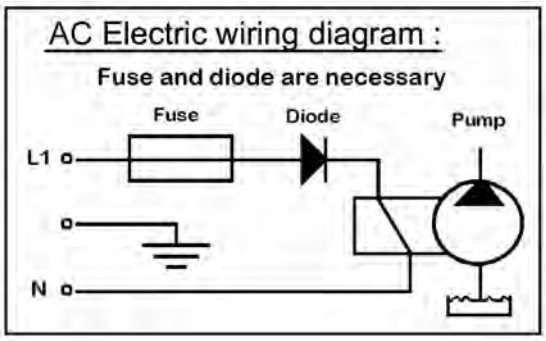
The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

EMX-08BD

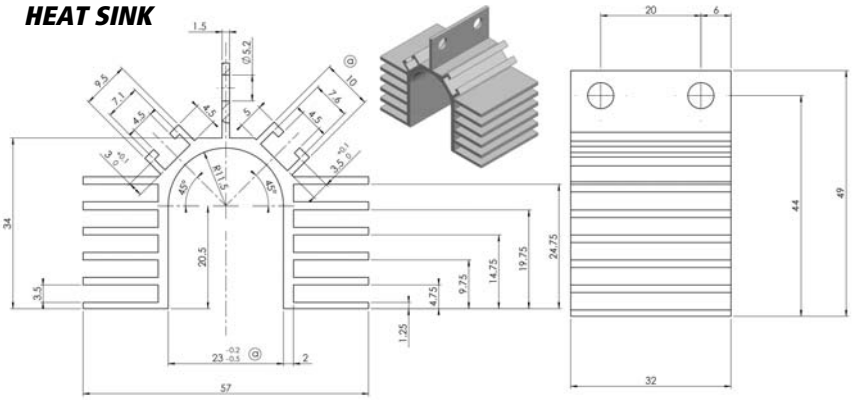


The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

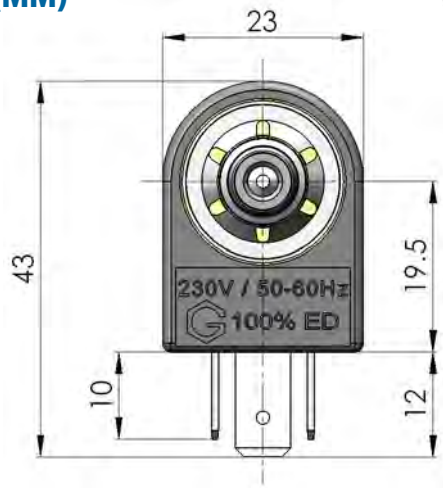
ELECTRICAL

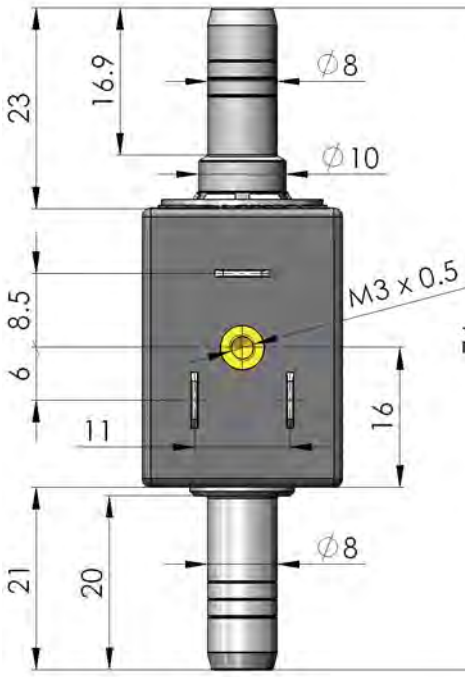


HEAT SINK



DIMENSIONS (MM)





ORDERING INFORMATION

ABCDEF
EMX08TC24VS3V

A Model	B Seal Material	C Piston Coating	D Voltage	E Elec. Conn.	F #Valves
EMX08=5/16" Hose Barb EME08= 1/8" NPT Male EMX08BD=5/16" Hose Barb EME08BD= 1/8" NPT Male	T=Teflon	C=Chrome	12V=12V 110V=110V 24V=24V 230V=230V	S=DIN Spade L=Flying Leads 130mm	2V=2Valves 3V=3Valves

Special materials and connections are available in OEM quantities. Please consult with us.

Options				
Model	**Description**		**Model**	**Description**
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out		106628	Heat Sink
Model 1N5406	Diode			

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GOTEC

EMS 10 Miniature Piston Pump

Solenoid Operated, Flow to 20 L/H (5.68 GPH)
Pressure to 1.3 Bar (18.9 PSI)

DESCRIPTION

Models EMS 10 and EMS 10-BD oscillating piston pumps are an economical solution for low volume liquid pumping applications where small size is a critical factor. All material in contact with fluid media is stainless steel or plastic

The pump is self priming.

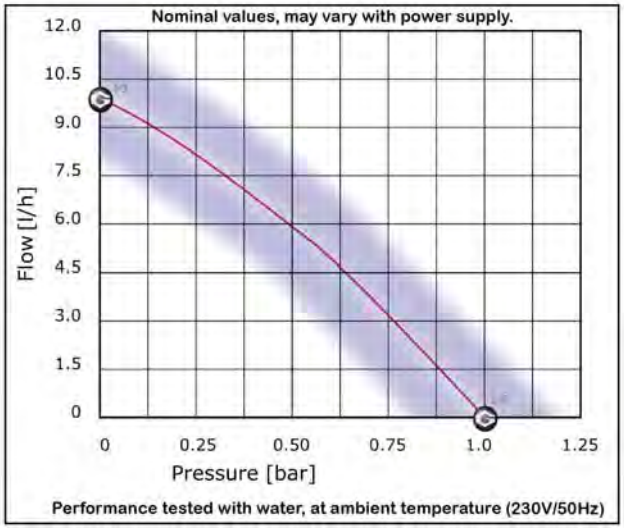
SPECIFICATIONS

GENERAL

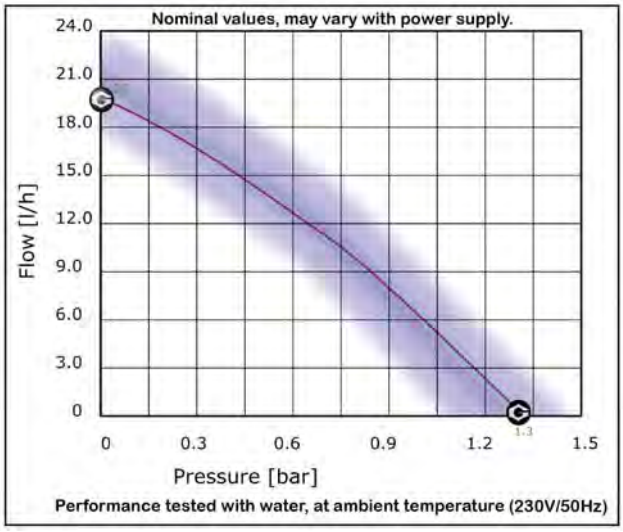
Pump Materials-
Piston: 431 stainless steel
Springs: 316 stainless steel
Body & Connectors: POM plastic (Hostaform)
Duckbill Valves: NBR
Maximum Pressure- EMS 10: 1 bar (14.5 PSI)
EMS 10-BD: 1.3 bar (18.9 PSI)
Maximum Flow- EMS 10: 10 L/H (2.64 GPH)
EMS 10-BD: 20 L/H (5.68 GPH)
Suction Height- EMS 10: 3 meters (9.84 ft)
EMS 10-BD: 1 meter (3.28 ft)
Viscosity Range- 1...600mm^2/s
Particle Tolerance- 100 mesh
Supply Voltage- 12, 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz
DC Operation: Optional model PD-106 DC driver board
Electrical Connections- Male DIN Spade (3 x 6.3 mm x .08 mm),
ISO/DIN 43650 form B, or 130 mm flying leads
Coil Insulation- class F, class H on request, Class 1
Power Consumption- 18 W
Operating Factor- 100% continuous @ 68°F
Operating Ambient Temperature-1 to 50°C (33.8 to 122°F)
Noise Level- Dry Running ~45dbA, open flow ~32dbA, max pressure ~30dbA
Optional Mounting- Integral Heat Sink w/2ea 1/8" Holes 3/4" on center (see drawing)
Weight- 95 g (0.2lb)

FLOW CURVES

EMS 10

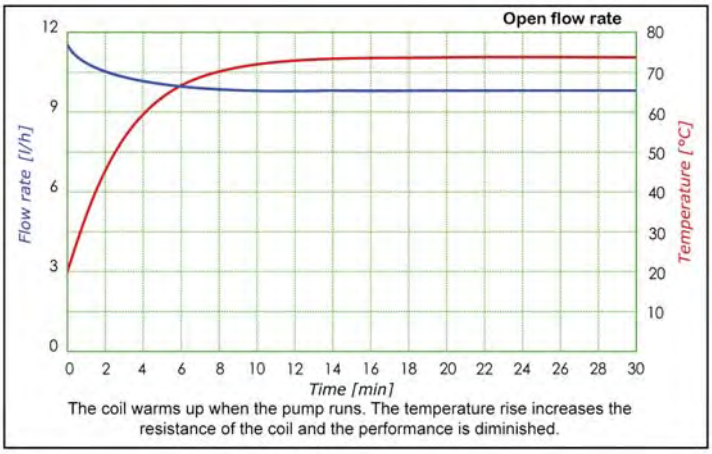


EMS 10-BD



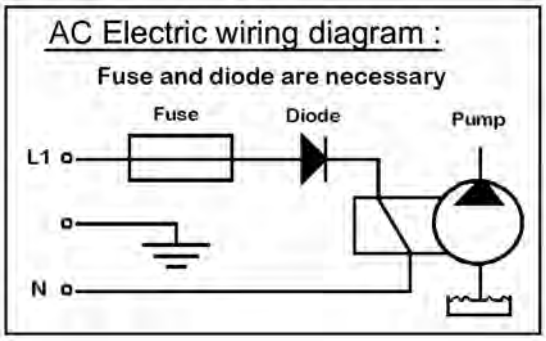
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE

EMS 10

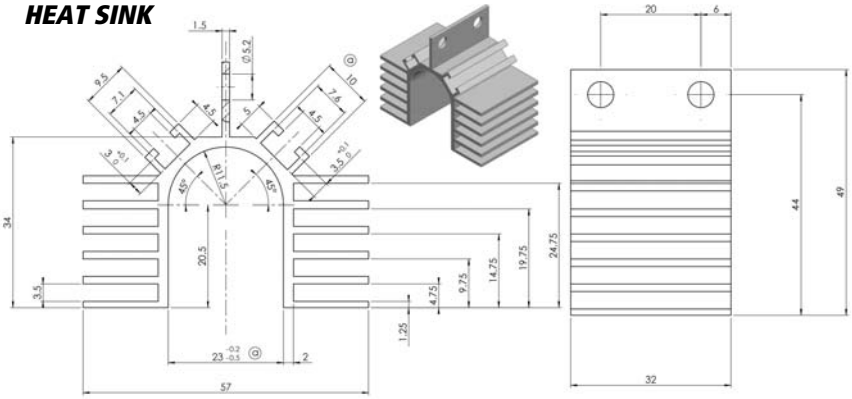


The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

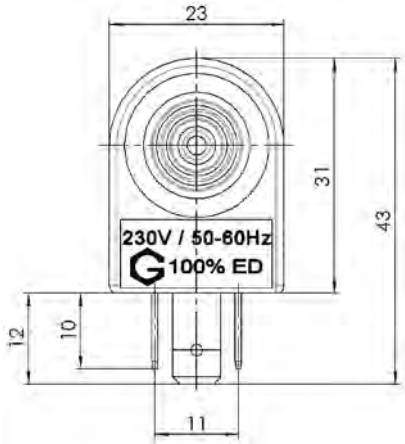
ELECTRICAL

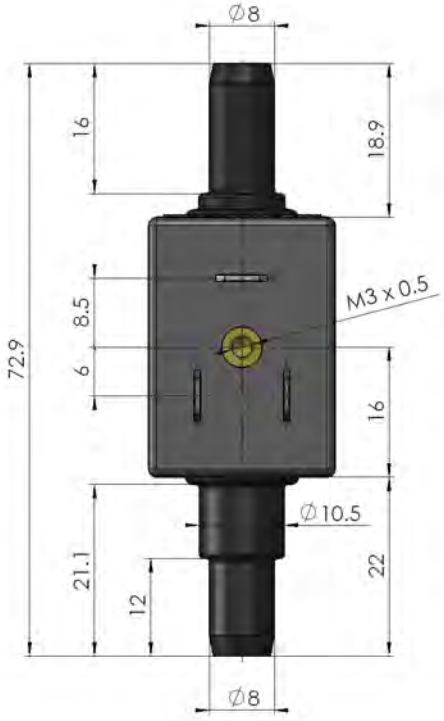


HEAT SINK



DIMENSIONS (MM)





ORDERING INFORMATION

ABC
EXAMPLE: EMS10-24VL

A Model	B Voltage	C Elect. Connection
EMS10 EMS10-BD	24V=24V 110V=110V 12V=12V 230V=230V	S=Spade L=Flying Leads, 130 mm

Options				
Model	**Description**		**Model**	**Description**
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out		106628	Heat Sink
Model 1N5406	Diode			

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GOTEC

ETS 21 Miniature Piston Pumps

Solenoid Operated, Flow to 60 L/H (15.9 GPH)
Pressure to 2.2 Bar (31.9 PSI)

DESCRIPTION

Model ETS 21 is a smaller version of the ETS 17, with a lower flow but a slight higher maximal pressure and a higher suction/priming pressure level (greater than 3 meters).

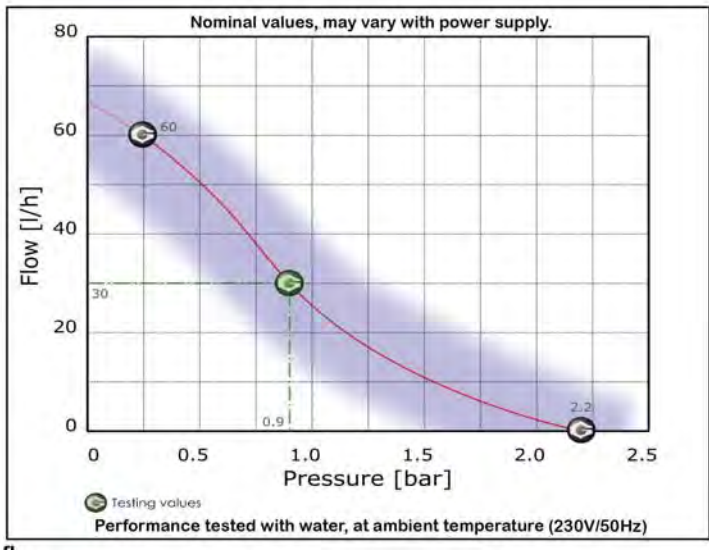
This pump typically finds application in Laboratory systems, printing ink handling and many other compatable liquid transfer applications.

SPECIFICATIONS

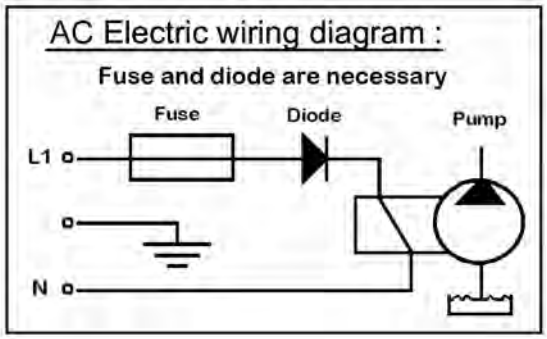
GENERAL

Pump Piston- Chrome coated AISI 431 SS
Pump Spring- AISI 316 SS
Pump End Connections- POM (Hostaform), 9.5 mm O.D. hose barbs (other on request)
Valve and Seal Material- NBR
Maximum Pressure-2.2 bar (31.9 PSI)
Maximum Flow- 60 L/H (15.9 GPH)
Suction Height- >3 meters (9.84 feet)
Viscosity- 1....600 mm^2/s
Particle Tolerance- 100 Mesh
Supply Voltage- 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz
DC Operation: Optional model PD-106 DC driver board
Power Consumption- 40 W
Insulation: Class F-100% ED / 20 [°C] (Class H on request), Class I (Class II on request)
Operating Factor- 100% continuous@ 68°F
Electrical Connections- 2 x 6.3 mm (1/4")x 0.8 mm spade
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)
Noise level (1m)- Open flow = ~55 [dB(A)]
Max. pressure = ~48 [dB(A)]
Weight- 450 g (.99 lb)

FLOW CURVE



ELECTRICAL



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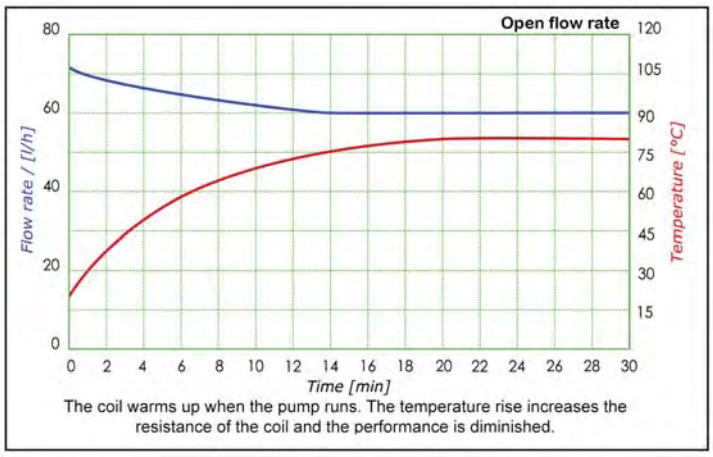
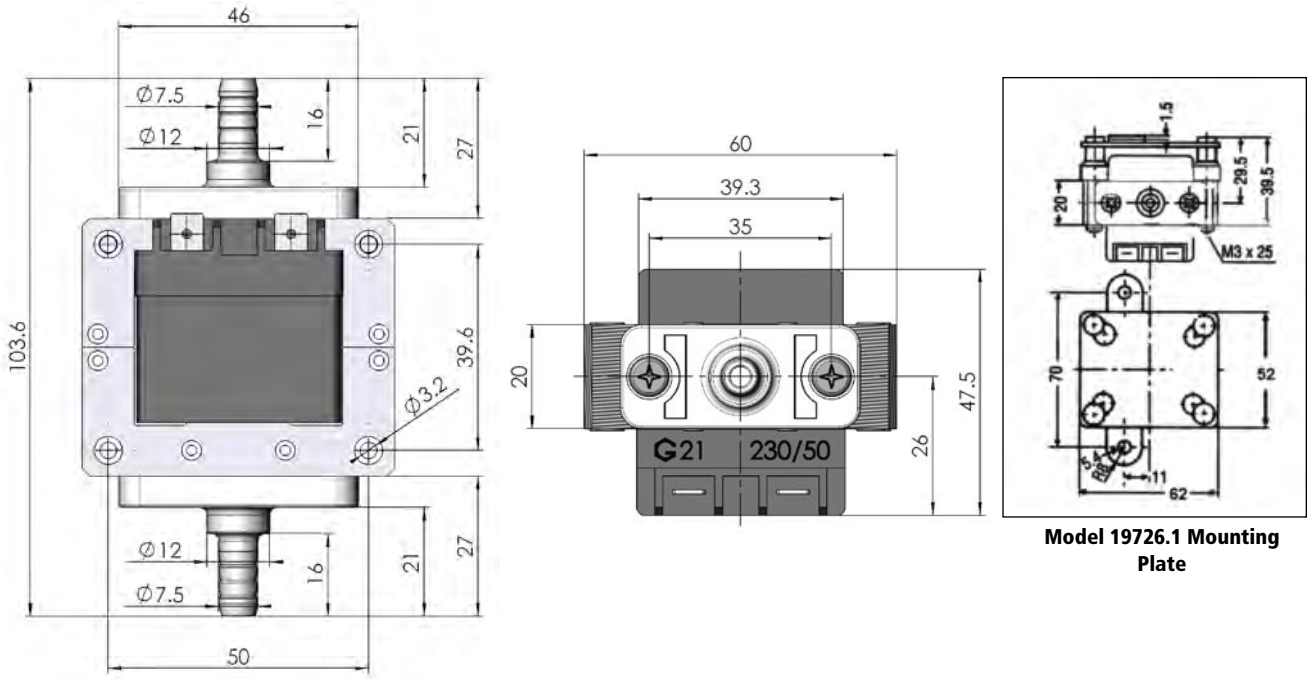
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

DIMENSIONS (MM)



Model 19726.1 Mounting Plate

ORDERING INFORMATION

A-BCD
EXAMPLE: ETS21S9PD-24V60HZS

A Model	B Voltage	C Frequency	D Elect. Connection
ETS21S9PD	24V=24V 110V=110V 230V=230V	60HZ=60 Hz 50HZ=50 Hz	S=Spade

Special materials and connections are available in OEM quantities. Please consult with us.

Options				
Model	**Description**		**Model**	**Description**
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out		19726.1	Mounting Plate
Model 1N5406	Diode			

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GOTEC

ETS 17 Miniature Piston Pump

Solenoid Operated, Flow to 90 L/H (23.8 GPH)
Pressure to 2 Bar (29 PSI)

DESCRIPTION

Model ET 17 offers a high output flow relative to other Gotec pumps.These pumps are a great solution for low volume liquid pumping applications. The pumps suitable for many fluid transfer applications.

The pumps are self priming.

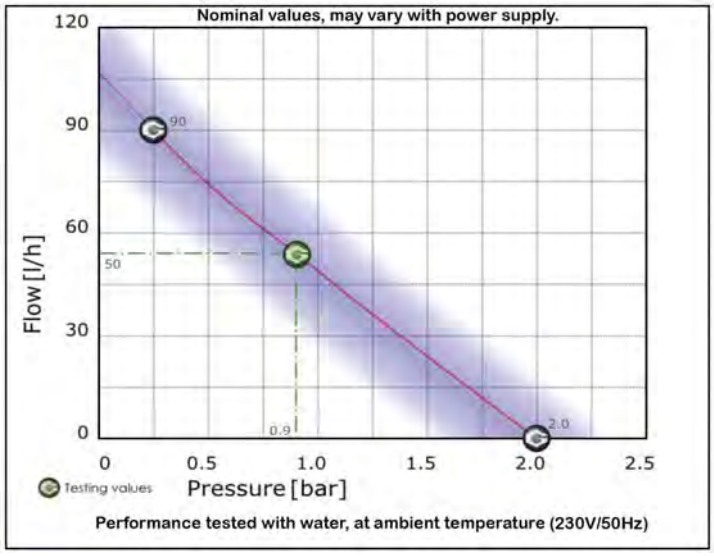
SPECIFICATIONS

GENERAL

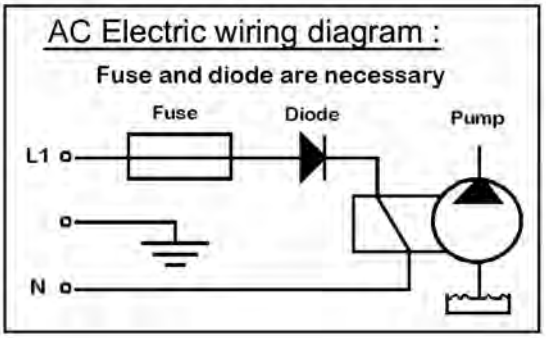
Pump Piston- Chrome coated AISI 431 SS
Pump Spring- AISI 316 SS
Pump End Connections- POM (Hostaform), 9.5 mm O.D. hose barbs (other on request)
Valve and Seal Material- NBR
Maximum Pressure-2 bar (29 PSI)
Maximum Flow- 90 L/H (23.8 GPH)
Suction Height- 3 meters (9.84 feet)
Viscosity- 1....600 mm^2/s
Particle Tolerance- 100 Mesh
Supply Voltage- 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz

DC Operation: Optional model PD-106 DC driver board
Power Consumption- 40 W
Insulation: Class F-100% ED / 20 [°C] (Class H on request), Class I (Class II on request)
Operating Factor- 100% continuous@ 68°F
Electrical Connections- 2 x 6.3 mm (1/4")x 0.8 mm spade
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)
Noise level (1m)- Open flow = ~65 [dB(A)]
Max. pressure = ~54 [dB(A)]
Weight- 480 g (1.06 lb)

FLOW CURVE



ELECTRICAL



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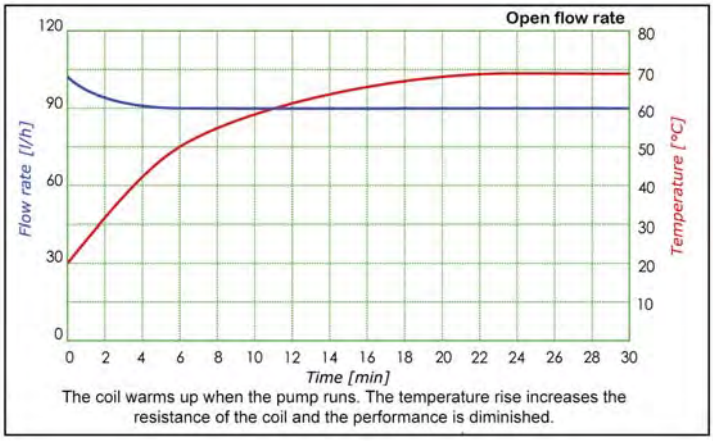
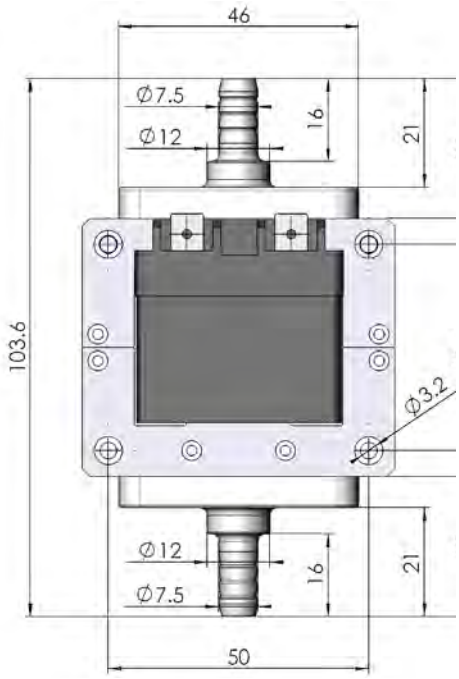
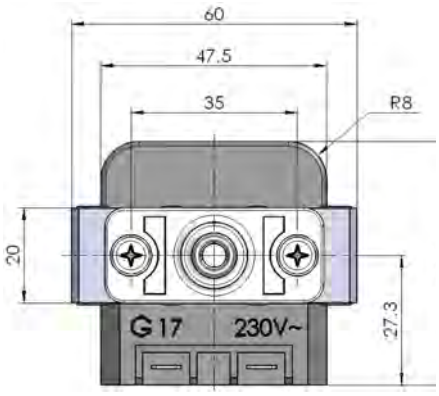
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE

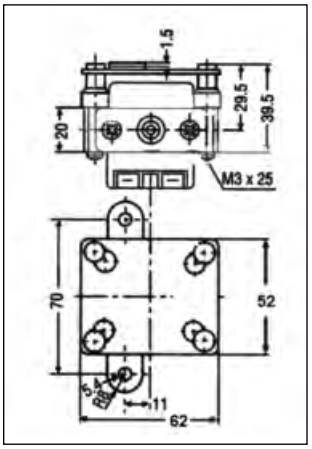


The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

DIMENSIONS (MM)







Model 19726.1 Mounting Plate

ORDERING INFORMATION

A-BCD
EXAMPLE: ET17S9PD-24V60HZS

A Model	B Voltage	C Frequency	D Elect. Connection
ET17S9PD	24V=24V 110V=110V 230V=230V	60HZ=60 Hz 50HZ=50 Hz	S=Spade

Special materials and connections are available in OEM quantities. Please consult with us.

Options				
Model	**Description**		**Model**	**Description**
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out		19726.1	Mounting Plate
Model 1N5406	Diode			

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GOTEC

ET 50, ET 100 & ET 150 Miniature Piston Pumps

Solenoid Operated, Flow to 65 L/H (17.2 GPH)
Pressure to 14.5 Bar (210 PSI)

DESCRIPTION

Model ET 50, 100 and 150 pumps are the same dimensionally but vary in terms of pressure delivery and flow characteristics.These pumps are a great solution for low volume liquid pumping applications. A range of wetted materials are available making the pumps suitable for many fluid transfer applications.

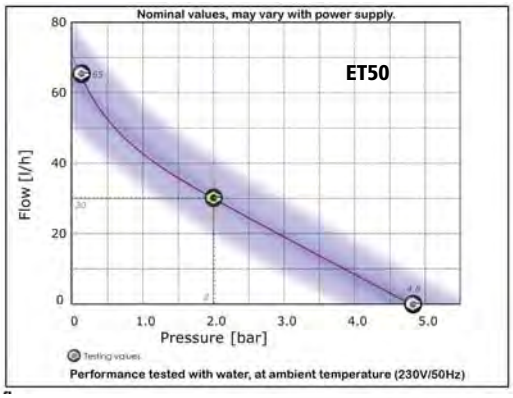
The pumps are self priming.

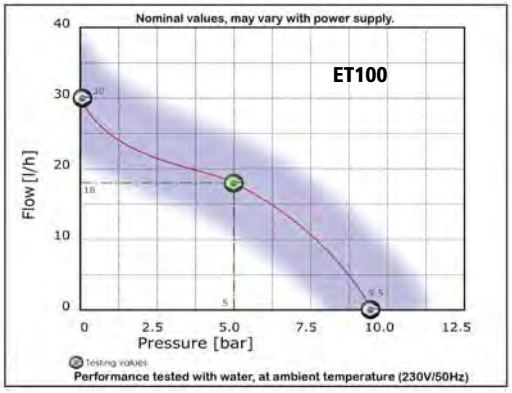
SPECIFICATIONS

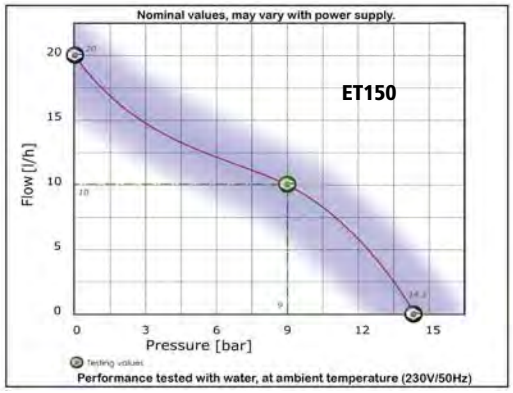
	ET50	ET100	ET150
Pump Piston	Chrome coated AISI 431 SS		
Pump Spring	AISI 316 SS		
Pump End Connections	AISI 303 SS w/G1/8 female thread or POM w/7.5 mm O.D.barb		
Valve/Seal Material	NBR		
Max Pressure	4.8 Bar (69.6 PSI)	9.5 Bar (138 PSI)	14.5 Bar (210 PSI)
Max Flow	65L/H (17.2 GPH)	30 L/H (7.93 GPH)	20 L/H (5.28 GPH)
Suction Height	2 m (6.56 ft)	2 m (6.56 ft)	1 m (3.28 ft)
Viscosity	1....600 mm^2/s		
Particle Tolerance	100 Mesh		

	ET50	ET100	ET150
Supply Voltage	24, 110, 230VAC, diode rectified		
Frequency	50/60 Hz		
DC Operation	Optional model PD-106 DC driver board		
Power Consumption	45 W		
Insulation	Class F-100% ED / 20 [°C] (Class H on request), Class I (Class II on request)		
Operating Factor	100% continuous@ 68°F		
Electrical Connections	2 x 6.3 mm (1/4")x 0.8 mm spade		
Ambient/Process Temperature Range	1 to 50°C (33.8 to 122°F)		
Options	G1/8 to 1/8" NPT male adapter; Mounting Bracket		

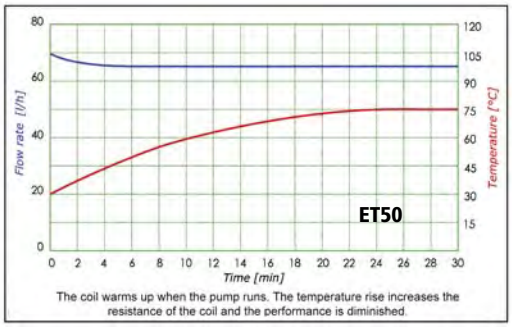
FLOW CURVES



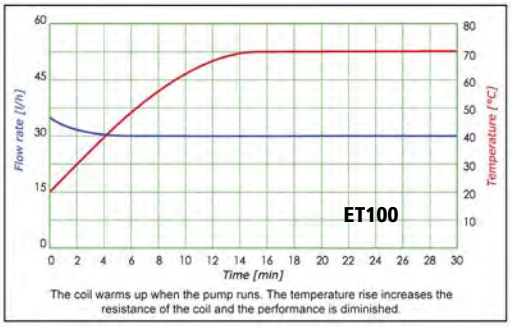




EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.



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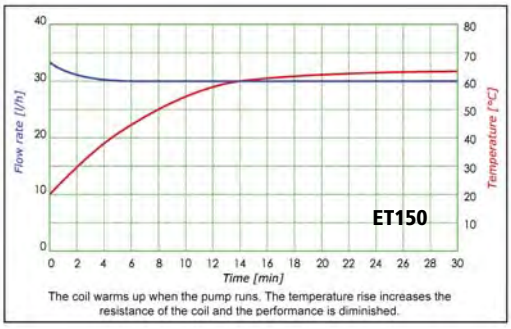
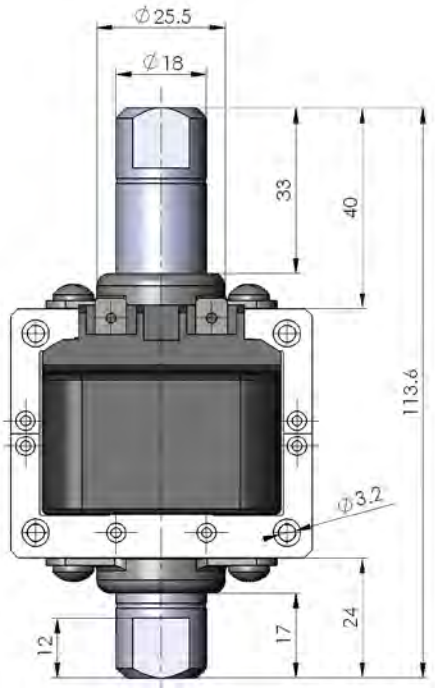
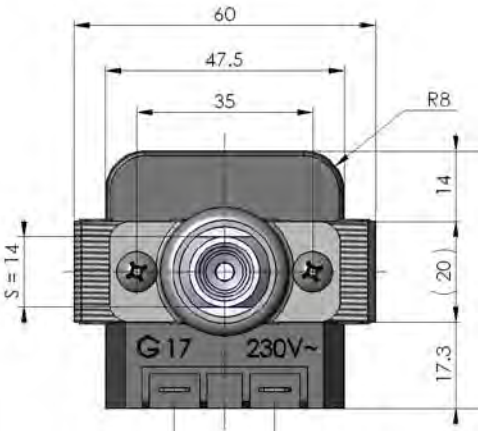
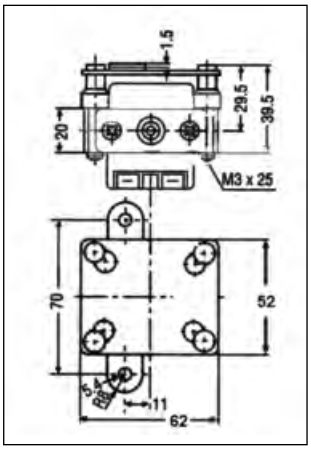


The coil warms up when the pump runs. The temperature rise increases the resistance of the coil and the performance is diminished.

DIMENSIONS (MM)

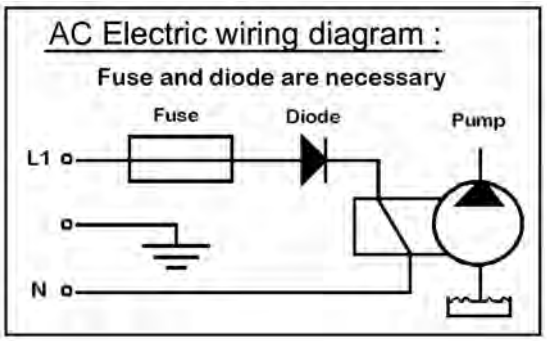






Model 19726.1 Mounting Plate

ELECTRICAL



ORDERING INFORMATION

ABCD (ETG100P24V60HZ)

A Model	B Seals	C Voltage	D Frequency
ETG50= G1/8 Female Threads ETS750= 7.5mm OD Plastic Barb ETG100=G1/8 Female Thread ETS750= 7.5mm OD Plastic Barb ETG150= G1/8 Female Threads ETS7150= 7.5mm OD Plastic Barb	P=NBR(Perbunan)	24V=24V 110V=110V 230V=230V 100V=100V	60Hz=60Hz 50Hz=50Hz

Special materials and connections are available in OEM quantities. Please consult with us.

Options				
Model	**Description**		**Model**	**Description**
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out		19726.1	Mounting Plate
Model 1N5406	Diode		112170	Male G 1/8 to 1/8 NPT Male adapter

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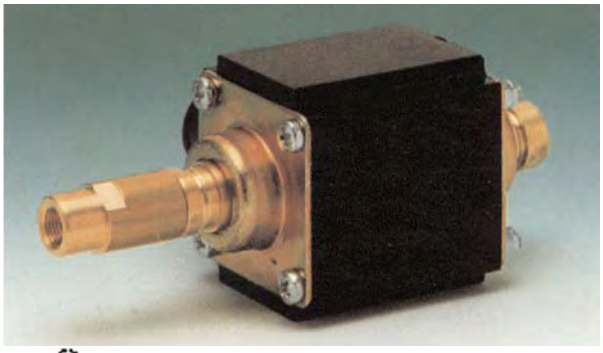
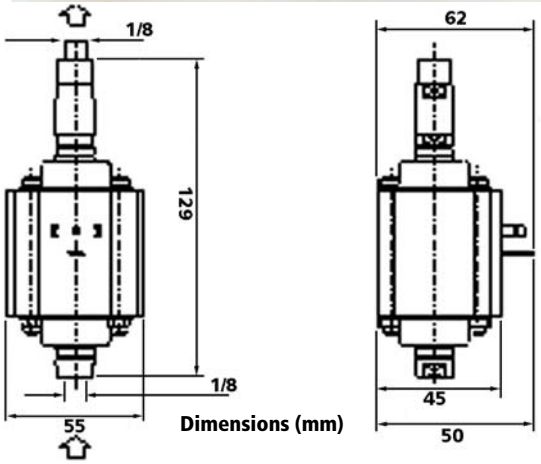
CLARK
Mono Oscillating Piston Pump
120 VAC, 0 to 95 LPH



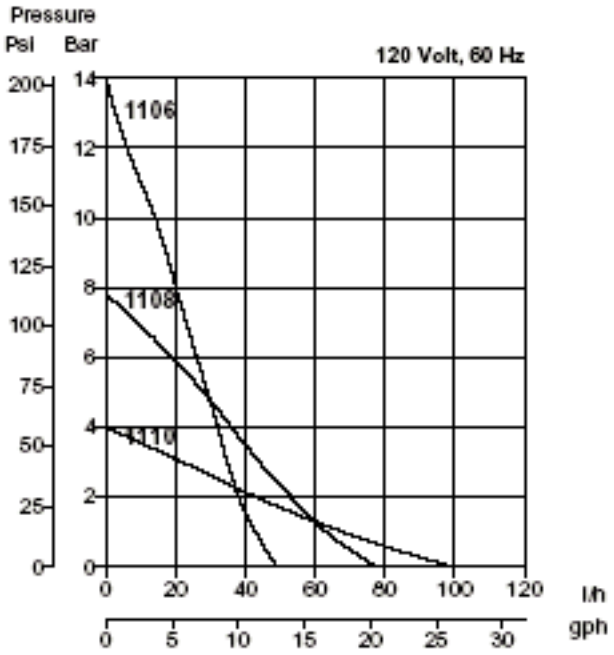
DESCRIPTION
This latest version of the "Mono" oscillating piston pump has been developed looking at the future. The hydraulic improvements make this pump the ideal component for applications where safety and reliability are necessary elements. The "Mono" oscillating piston pump, designed for pumping a range of fluids including potable water, food quality low viscous syrup and semi-aggressive fluids at relatively high pressures under continuous operation, is available with brass or plastic fittings, with glass or EPDM check valves and a AISI 430 or AISI 630 stainless steel piston.

The coil is made of self-extinguishing material with a class H insulation winding. All the models are equipped with a noise suppression device that allows installation of the pump in those applications where low noise is a premium. Shock absorbing supports are also available for the quietest operation.



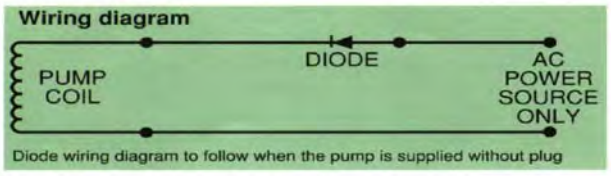
TYPICAL APPLICATIONS
- Espresso coffee machines
- Beverage vending machines
- Smoke generators
- Steam generators
- Carpet cleaners
- Water purifiers
- Water Carbonators

SPECIFICATIONS
"IF" Coil(UL recognized, file E164244)
Voltage : 120 V
Frequency : 60 Hz
Power : 70 W
Current : 0.98 A
Seals: NBR
Inlet/Outlet Connections: 1/8" NPT brass
Flow: Dependent on piston size, see flow chart
Model 1106- 6mm piston
Model 1108- 8mm piston
Model 1110- 10mm piston



ORDERING INFORMATION

Model	Description
1106RLIFM9N	6 mm Piston
1108RLIFM9N	8 mm piston
1110RLIFM9N	10 mm piston



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CLARK

PD-106 Driver Board For Gotec Solenoid Piston Pumps

DC In, Pulsed DC Out

DESCRIPTION

Model PD-106 is a board level product intended for mounting in a customer provided enclosure. It is intended for use with Gotec solenoid piston pumps to drive the pumps with pulsed DC power.

The board accepts 9-35 VDC input and has a pulsed 9-35 VDC output.

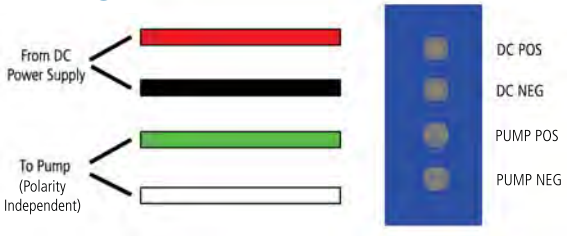
The pulse length is fixed at a nominal 10ms and the dead time between pulses is adjustable via a potentiometer.

The circuit can drive pumps up to 35 volts.

PUMP DRIVER SPECIFICATIONS

Gotec Pump Series Supported: 12V & 24V models from series ED, EM, ET & ES
Input: 9 – 35 VDC
Output: 9 – 35 V pulsed output
Pulse length: fixed at 10 ms nominal
Current output: 1.5 A maximum
Frequency: adjustable via single turn potentiometer, 50Hz maximum
PC Board:
Material: FR4
Surface Finish: Immersion Silver
Solder Mask: LPI Green
Connections: 4 position 5 mm PCB connector terminal block
Mounting: Four through holes, 0.156" (4 mm) diameter
Accesssories: Units supplied with four screw mount Nylon circuit board supports. These mount to customer enclosure/chassis with self-tapping no. 6 screws (not supplied)
Dimensions: 2.50"W x 1.75" D x 0.91" Max. H (not including board supports)
Packaging: 4" x 6" ESD shielding bag

WIRING



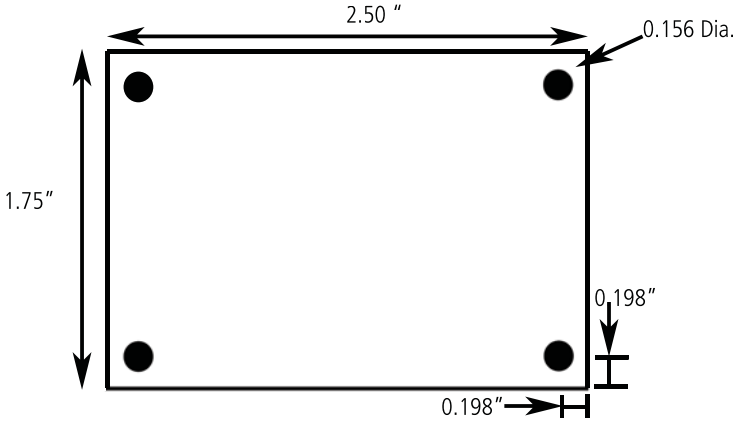
ORDERING INFORMATION

MODEL NUMBER: PD-106

FEATURES

-DRIVE GOTEC SOLENOID PUMPS WITH PULSED DC POWER
- PUMPS RUN QUIETLY RELATIVE TO DRIVING WITH AC POWER
- PUMPS RUN COOLER THAN AC DRIVEN PUMPS
- PUMP FLOW DELIVERY ADJUSTABLE BY CHANGING VOLTAGE OR FREQUENCY

DIMENSIONS (INCHES)



Application Note: To maximize the life of your Gotec piston pump it is recommended that supply voltage not exceed 140% of rated pump voltage (16.8 volts for a 12 volt rated pump) and frequency be kept below 40 Hz. The PD-106 is designed for use specifically to drive certain Gotec solenoid pumps. Check pump data sheets for suitability or call factory.

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Pageboy Series SFD Pocket Size Diaphragm Pump

Pneumatically Powered Diaphragm Pumps For Liquids

DESCRIPTION

The Pageboy series SFD15 is a unique, pocket-sized, air operated pump that incorporates a stress-free diaphragm to give very high reliability and long life, even when pumping strong acids or powerful solvents (MEK, acetone, chloroform etc.).

FEATURES

AIR OPERATED-SAFE IN HAZARDOUS AREAS

SELF PRIMING

INCORPORATES STRESS-FREE DIAPHRAGM FOR LONG LIFE

STOPS AUTOMATICALLY AGAINST A CLOSED DISCHARGE

IDEAL FOR LOW VISCOSITY SOLUTIONS, LIGHT OILS AND SOLVENTS

FEW MOVING PARTS

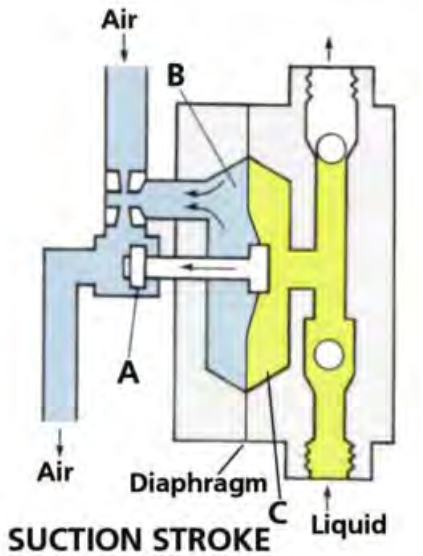
GENERAL

The pump consists of a chamber that is divided into compartments by a diaphragm. One chamber is the pneumatic pressure/vacuum chamber(B). The other is the pump chamber (C).

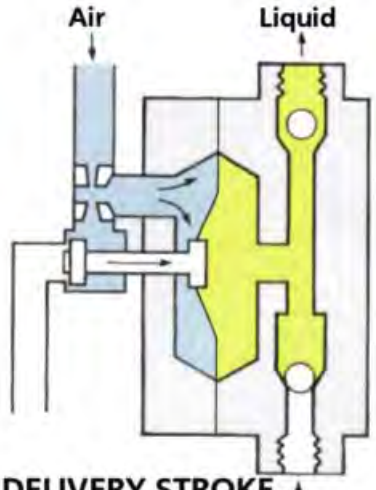
Compressed air enters through a venturi which reduces pressure in the pressure/vacuum chamber (B) causing the diaphragm to move away from the pump chamber (C). This is the suction stroke. The diaphragm pushes the control rod until the poppet valve (A) closes the air exhaust port. As the air pressure rises in the pressure/vacuum chamber (B) the diaphragm is forced into the pump chamber. This is the delivery stroke, during which the diaphragm pulls the control rod off its seat. This allows air through the venturi causing the suction stroke to be repeated.

The diaphragm is used simply to separate the air from the liquid and thus operates without stress. The result is very high reliability, particularly when compared with other types of diaphragm pumps. The pump is self-priming, has low air consumption and is safe to use in a hazardous area. It stops automatically against a closed valve,maintaining a delivery line pressure equal to the air supply pressure. It starts automatically when the delivery line pressure falls such as when a valve is opened.

The pump is designed for vertical-upward flow and can be mounted by the extended tie-rods supplied.



SUCTION STROKE (Venturi Effective)



DELIVERY STROKE (Exhaust Port Closed)

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SPECIFICATIONS

Maximum Output- 3 l/m
Maximum Pressure- 6 bar (87 psig)
Air Supply- 80-100 psig (a 15 psi low pressure model is an available option)
Air Consumption- Approx. 0.5 cfm
Body Materials- polypropylene, PTFE, 316SS, or aluminum
Diaphragm- PTFE, FEP
Pump Valve Housing & Pin: PTFE for all models
Valve Ball Material: PTFE (for PTFE, PDVF, or PP Bodies; Stainless Steel (for SS or Aluminum bodies)

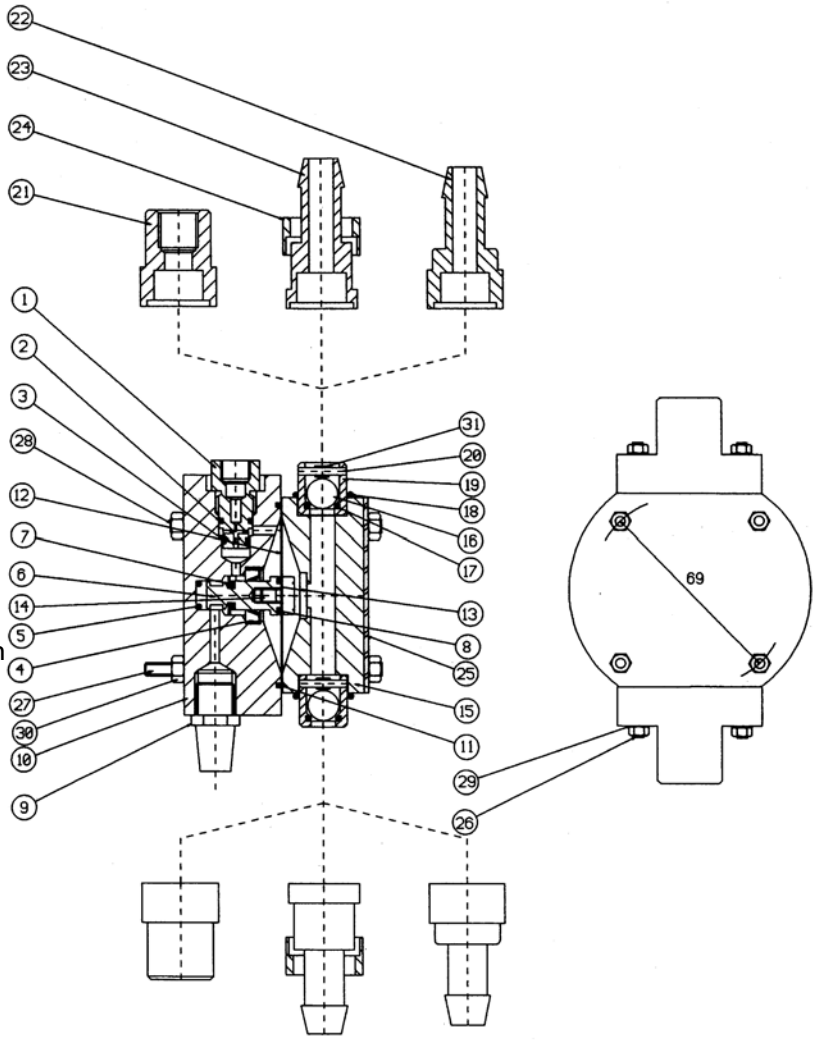
Seals- EPDM (some chemicals and solvents)
Nitrile (for water, caustic soda and mineral oils)
FPM (for acids, oils and fats, hydrocarbons)
Chemraz® (for MEK,THF, DMF, toluene, amines, etc.)

Connections-
- Stainless/Aluminum body- 1/4" BSP, NPT
- Polypropylene/PTFE body- 1/2" hose barb
- Air Inlet- 1/8" BSP (NPT Adaptor Available)

Dimensions-
- Height- 133 mm
- Body- Approx. 80 mm
- Depth- 56 mm
- Weight- 0.33 -1kg (depending upon materials of construction).

SDF15 PARTS

1 Venturi complete
2 O ring, inner venturi
3 O ring,outer venturi
4 U Seal
5 O Ring
6 Control Rod
7 Poppet
8 O Ring
9 Silencer
10 Body, Air Motor
11 Seal, Diaphragm edge
12 Diaphragm
13 Washer
14 Center Screw
15 Body Block
16 Ball
17 O ring, valve seat
18 O ring, valve seal
19 Housing, valve
20 Stop pin
21 Connector
22 Connector
23 Connector
24 Clamp
25 Backing plate
26 Tie- rod, 105mm
27 Tie-rod, 85mm
28 Tie-rod, 75mm
29 Washer
30 Nut
31 Collar, valve pin



ORDERING INFORMATION

ORDER NUMBER

ABCDEF

EXAMPLE- SFD15SVTNLP

A Model	B Pump Body	C Seals	D Diaphragm	E Body Connections	F Options
SFD15	P=Polypropylene S=316 stainless steel T=PTFE A=Aluminum	V=FPM Z=Chemraz® E=EPDM N=Nitrile (NBR)	T=PTFE F=FEP	H=1/2" Hose Barb (PP & PTFE Bodies) N= NPT (SS & Al Bodies) B= BSP (SS & Al Bodies)	LP=15 psi supply pressure (PTFE Diaphragm Only)
P/N 112170- Adaptor, Stainless Steel,1/8" BSP to 1/8" NPT Male					

Chemraz is a registered trademark of Greene, Tweed & Co.

DEBEM
Air Operated Diaphragm Pumps
Flow Rates to 900 LPM (238 GPM), Pressure to 70 Meters (99.7 PSI)

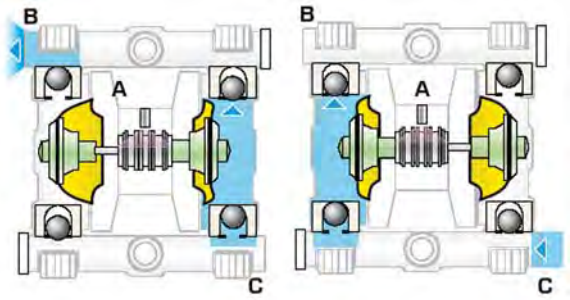
DESCRIPTION

Debem air operated diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

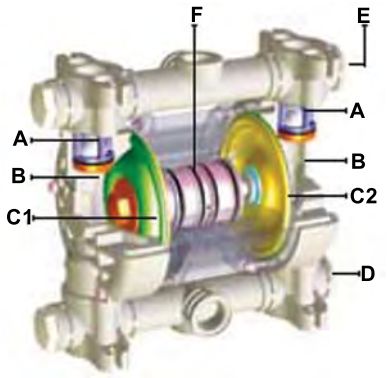
The stall-prevention pneumatic system assures safe pump running and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility. In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

PRINCIPLE OF OPERATION:



The compressed air introduced by the pneumatic exchanger (A) behind one of the two diaphragms generates compression and pushes the product into the delivery duct (B), at the same time the opposing diaphragm that is integral with the exchanger shaft creates a vacuum and intakes the fluid (C). Once the stroke has been completed, the pneumatic exchanger diverts the compressed air behind the opposing diaphragm and the cycle is reversed.

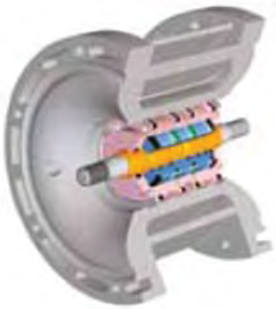


A= ball valves
B= pumping chamber
C1= product-side diaphragm
C2= air-side diaphragm
D= suction manifold
E= delivery manifold
F= pneumatic exchangers

FEATURES

-Available in PP, PVDF/ECTFE, Aluminum and AISI 316 Stainless Steel
-Use in potentially-explosive atmospheres (ATEX zone 1-2 certification)
-Suitable for demanding applications and high-humidity environments
-Dry operation
-Dry self-priming
-Actuated using non-lubricated air
-Stall-prevention pneumatic circuit
-Adjustable flow rate and head pressure
-Twin-manifold option (two suction and two delivery)
-User-friendly maintenance and parts replacement
-Excellent performance and value for money

PNEUMATIC EXCHANGERS



The heart of an air-operated diaphragm pump consists of the pneumatic exchanger that Debem has succeeded in developing and innovating in a revolutionary manner, patenting the most durable and reliable system the market currently has to offer. This device introduces compressed air to alter the pressure balance of the diaphragms assisted by a stall-prevention circuit that ensures optimum performance even under the most critical conditions. It has an extremely compact footprint and the small number of components ensures exceptional sturdiness and service life even under the most exacting conditions. The air passages are carefully designed and optimized to prevent the formation of ice even in low-temperature and high-head pressure applications.

The pneumatic exchanger is an integrated system with a single central cartridge that does not require additional external components.

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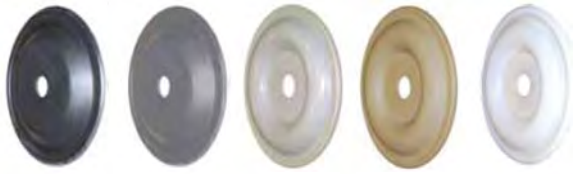
DIAPHRAGMS



Diaphragms are the components subjected to greatest stress during suction and pumping, when they must also withstand the liquid's chemical attack and temperature. Correct assessment and selection is therefore crucial for diaphragm service life, investment decisions and maintenance costs. A modern process of design, destructive testing and careful analysis of results has enabled Debem to develop LONG LIFE new generation diaphragms. The shape and profile of these products provides a greater working surface and improved load redistribution, thus reducing material stress and yield to a minimum.

Rubber Diaphragms

They are made from rubber compounds with special additives that improve chemical properties as well as mechanical bending and strength characteristics. These diaphragms have a nylon backing cloth that improves stress dis-tribution:
NBR: inexpensive and particularly suited to petroleum- and oil-based liquids;
EPDM: good acid, alkaline and abrasion resistance, as well as good flexibility even at low temperatures.

Thermoplastic Diaphragms

They are made from thermoplastic polymers that provide high mechanical stress resistance and distribution.
HYTREL®: good abrasion resistance and suitable for food processing.
SANTOPRENE®: excellent acid and alkaline resistance, high flexural strength and good abrasion resistance.

PTFE Diaphragm

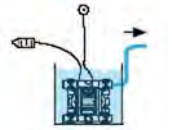
This material is noted for its excellent resistance to high temperatures, chemicals and corrosive agents. Debem PTFE diaphragms are subjected to a double heat treatment in order to increase elasticity and service life. Each batch undergoes random destructive testing in order to verify its performance.This diaphragm can be fitted together with one of those previously mentioned in order to increase resistance to the liquid's corrosive chemicals and temperature.

Hytrel® is a registered trademark of DuPont.
Santoprene® is a registered trademark of Exxon Mobile.

INSTALLATION

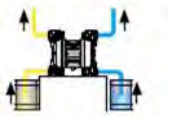
Diaphragm pumps should be bolted horizontally to the feet or holes provided with the exchanger shaft positioned horizontally.

Self-priming (max. viscosity 10000 cps at 20° C)

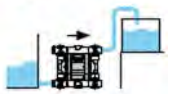


Immersed (max. viscosity 50000 cps at 20° C)

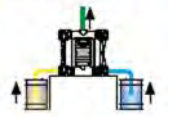
Drum transfer (max. viscosity 10000 cps at 20° C)



Twin delivery manifold (max. viscosity 50000 cps at 20° C)



Positive suction head (max. viscosity 50000 cps at 20° C)



Twin suction and delivery manifold (max. viscosity 50000 cps at 20° C)

MODEL SERIES

Series B & Series M Plastic Pumps:

The plastic B range is designed for the chemical industry's most demanding applications including highly-aggressive liquids and acids.
Materials: PP - PVDF
Self-priming capacity: max 6m (19.7 ft)
Max. head: 70m (99.7 PSI)
Max. flow rate: 30 to 900 l/min (7.9 to 238 GPM)
Viscosity: up to 50000 cps

Series B & Series M Metal Pumps:

The metal BOXER range is designed for demanding applications throughout the paint sector and for solvent-based liquids.
Materials: Aluminium - AISI 316
Self-priming capacity: max 6m (19.7 ft))
Max. head: 70 m (99.7 PSI)
Max. flow rate: 30 to 900 l/min (7.9 to 238 GPM)
Viscosity: up to 50000 cps

Series CU Pumps:

This compact range with reduced footprint can be close-mounted where space is at a premium.
Materials: PP - ECTFE
Self-priming capacity: max 3m (3.94 ft)
Max. head: 70m (99.7 PSI)
Max. flow rate: 5 to 17 l/min (1.3 to 4.5 GPM)
Viscosity: up to 5000 cps

DEBEM

Model MID Air Operated Diaphragm Pump

Flow Rates to 5 LPM (1.32 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

MID mini diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

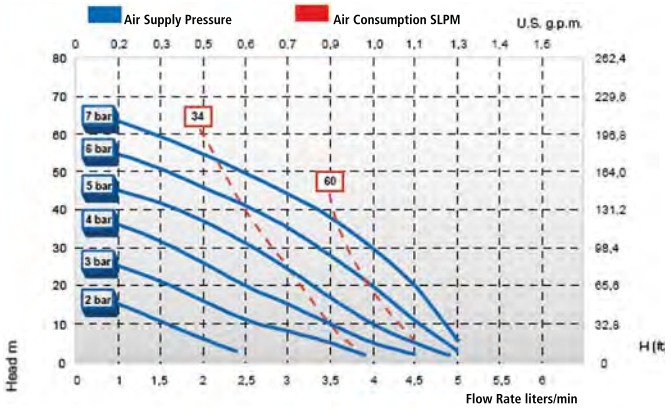
SPECIFICATIONS

Pump Body Materials: PP (Polypropylene)
Intake/delivery connections: 1/4" NPT Female
Air Connection: 1/8" NPT Female
Max. Self-Priming Capacity: 3 meters (9.84 ft)
Max. Flow Rate: 5 l/min (1.32 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 0 mm (0")
Net Weight: 0.5 Kg (1.1 lbs)
Max Temperature: PP, 60°C (140°F)
ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive centre casing or from metal with non-conductive centre casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)

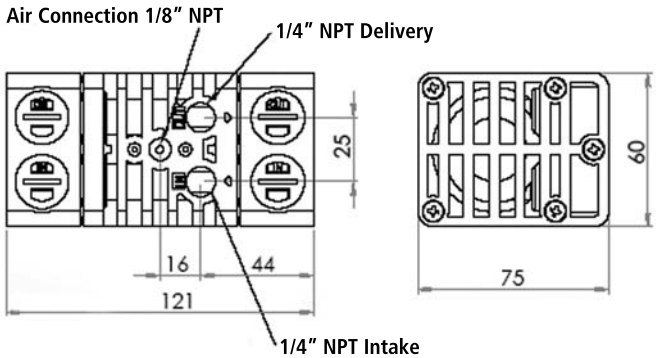
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber), made from conductive plastic. ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFG

Example: MIDPNTGRT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
MID	P= Polypropylene	N= NBR	T= PTFE	G= Pyrex Glass	R= PPS-V K= PEEK (Use for Hydrogen Peroxide)	T= PTFE	-= None C= CONDUCT ATEX Rating

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DEBEM

Model CU15 Air Operated Diaphragm Pump

Flow Rates to 17 LPM (4.49 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

Cu Series mini diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

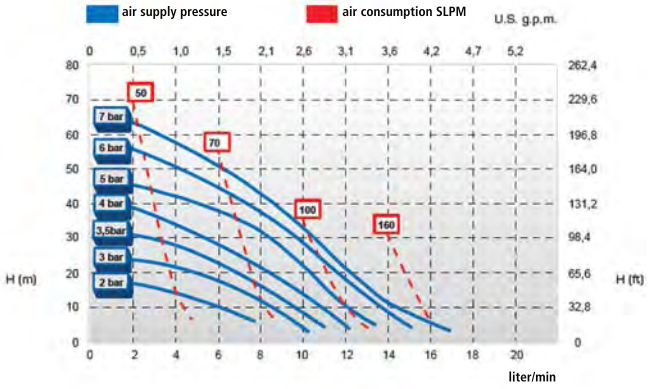
SPECIFICATIONS

Pump Body Materials: PP or ECTFE
Intake/delivery connections: 3/8" NPT Female
Air connection: 3/8" NPT Female
Max. self-priming capacity: 3 meters (9.84 ft)
Max. flow rate: 17 l/min (4.49 GPM)
Max. head: 70 m (99.7 PSI)
Max. air supply pressure: 7 bar (102 PSI)
Max. diameter of passing solids: 0.5 mm (0.0197")
Net Weight PP: 1 Kg (2.2 lbs)
Net Weight ECTFE: 1.5 Kg (3.31 lbs)
Max Temperature: PP, 60°C (140°F); ECTFE, 95°C (203°F)
ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive centre casing or from metal with non-conductive centre casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)

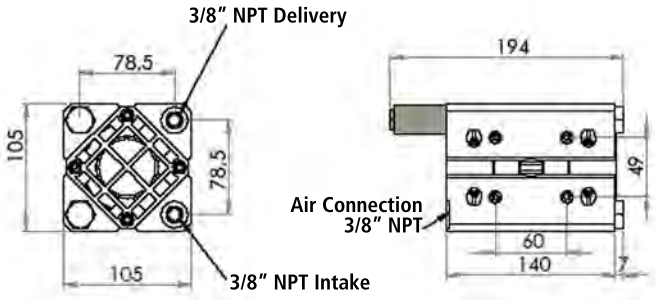
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFG

Example: CU15ECNTTET

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	Options
CU15	P= Polypropylene EC= ECTFE	N= NBR	T= PTFE	T=PTFE A= AISI 316 D= EPDM (PP Body Only)	P= Polypropylene (PP Body Only) A= AISI 316 I= PE-UHMV (PP Body Only) E= ECTFE (ECTFE Body Only)	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM
Model MICR Air Operated Diaphragm Pump
Flow Rates to 30 LPM (7.93 GPM), Pressure to 70 Meters (99.7 PSI)

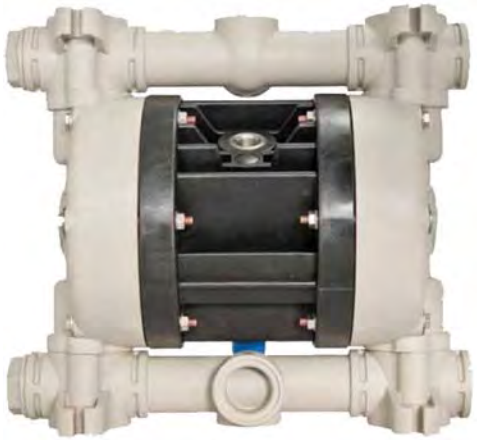
DESCRIPTION

MICR diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

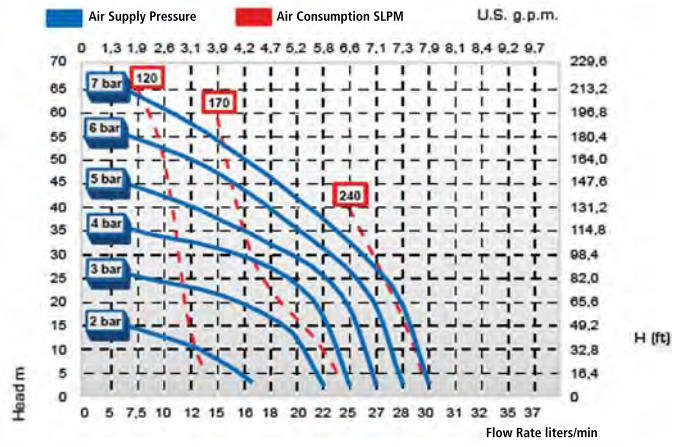
They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).



SPECIFICATIONS

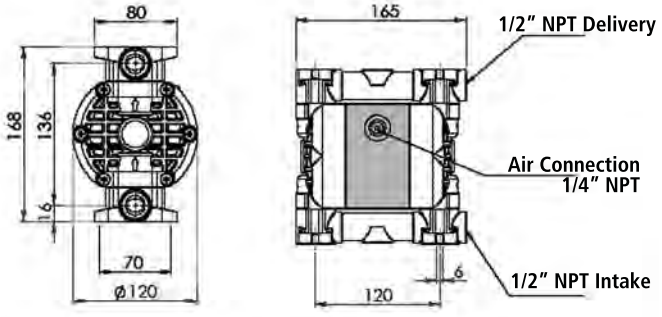
Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1/2" NPT Female
Air Connection: 1/4" NPT Female
Max. Self-Priming Capacity: 6 meters (19.7 ft)
Max. Flow Rate: 30 l/min (7.93 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 2 mm (.0787")
Net Weight: PP, 1.6 Kg; PVDF, 1.9 Kg; Alu, 2 Kg; AISI316, 3.8 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive centre casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFG
Example: MICRAHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	Options
MICR	P= Polypropylene FC= PVDF+CF AL= Aluminum A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	T=PTFE A= AISI 316 D= EPDM (Aluminum & PVDF Bodies Only)	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 L= Aluminum Pump Body / Ball Seats Polypropylene P, A, I PVDF F, A Aluminum L, I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B50 Air Operated Diaphragm Pump

Flow Rates to 50 LPM (13.2 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B50 diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

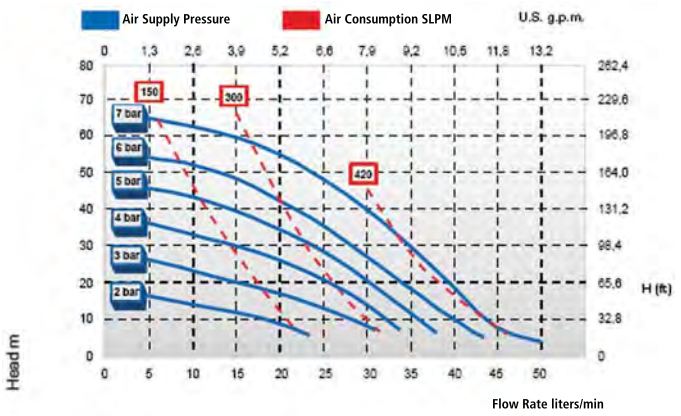
They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B50 Aluminum

SPECIFICATIONS

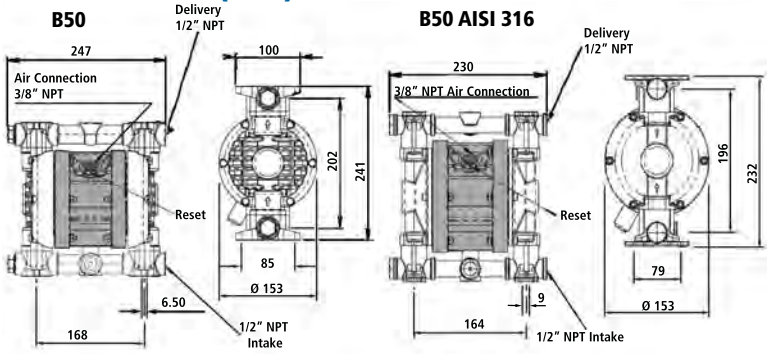
Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1/2" NPT Female
Air Connection: 3/8" NPT Female
Max. Self-Priming Capacity: 5 meters (16.4 ft)
Max. Flow Rate: 50 l/min (13.2 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 4 mm (0.157")
Net Weight: PP, 3.6 Kg; PVDF, 4.2 Kg; Alu, 4 Kg; AIS316 6.5 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH

Example: B50AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B50	P= Polypropylene FC= PVDF+CF AL= Aluminum A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body — Balls Polypropylene — T,D,N,A PVDF — T, A Aluminum — T,D,N,A AISI 316 SS — A	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 L= Aluminum Pump Body — Ball Seats Polypropylene — P, A, I PVDF — F, A Aluminum — L, I AISI 316 SS — A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Models B80/B81 Air Operated Diaphragm Pumps

Flow Rates to 100 LPM (26.4 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B80/B81 diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

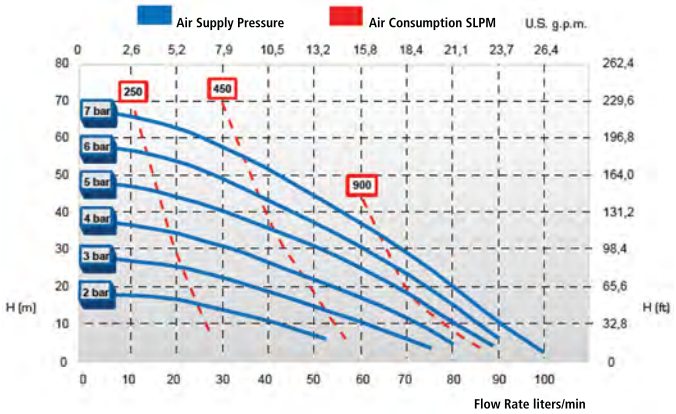
They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B80 PP

SPECIFICATIONS

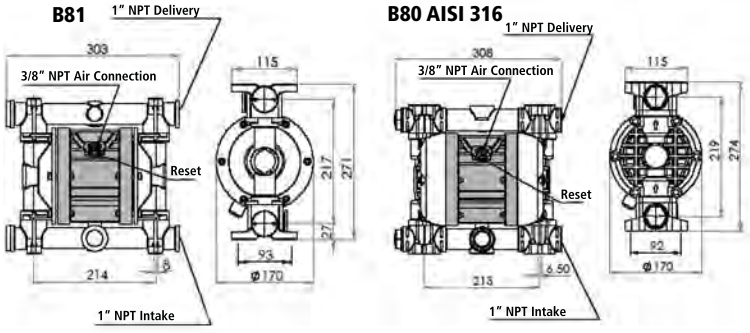
Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1" NPT Female
Air Connection: 3/8" NPT Female
Max. Self-Priming Capacity: 6 meters (19.7 ft)
Max. Flow Rate: 100 l/min (26.4 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 4 mm (0.157")
Net Weight: PP, 5.0 Kg; PVDF, 6.5 Kg; Alu, 6.5 Kg; AIS316 10.5 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFG

Example: B80AHTTAT

A Model & Pump Body Material	B Air Side Diaphragm	C Fluid Side Diaphragm	D Balls	E Ball Seats	F O Rings	G Options
B81P= Polypropylene B81FC= PVDF+CF B81AL= Aluminum B80A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N,A PVDF T, A Aluminum T,D,N,A AISI 316 SS A	P= Polypropylene F= PVDF E= ECTFE I= PE-UHMV A= AISI 316 L= Aluminum Pump Body / Ball Seats Polypropylene P, A, I PVDF F, A Aluminum L, I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B100 Air Operated Diaphragm Pump

Flow Rates to 150 LPM (39.6 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B100 diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

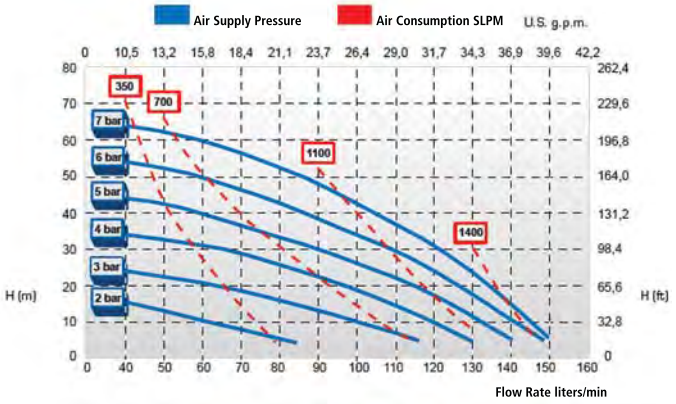
They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B100 Aluminum

SPECIFICATIONS

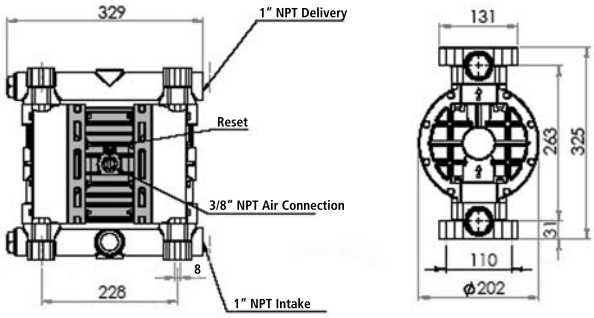
Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1" NPT Female
Air Connection: 3/8" NPT Female
Max. Self-Priming capacity: 5 meters (16.4 ft)
Max. Flow Rate: 150 l/min (39.6 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 4 mm (0.157")
Net Weight: PP, 7.5 Kg; PVDF, 8.5 Kg; Alu, 8.2 Kg; AIS316 11 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH

Example: B100AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B100	P= Polypropylene FC= PVDF+CF AL= Aluminum A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N,A PVDF T, A Aluminum T,D,N,A AISI 316 SS A	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 R= PPS-V Pump Body / Ball Seats Polypropylene P, A, I PVDF F, A Aluminum R, I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B150 Air Operated Diaphragm Pump

Flow Rates to 220 LPM (58.1 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B150 diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

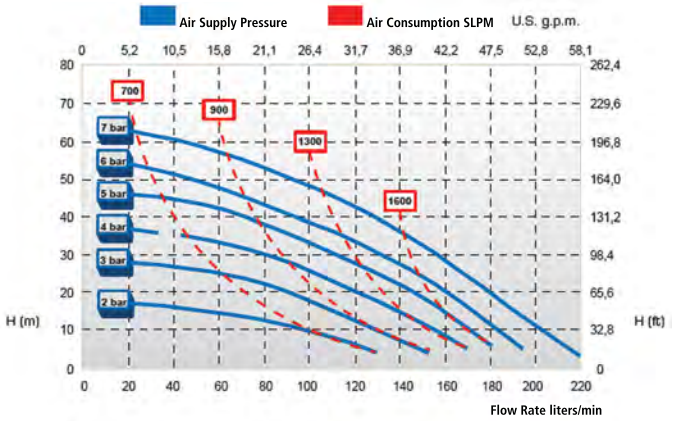
The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B150 AISI 316 SS

FLOW CURVES

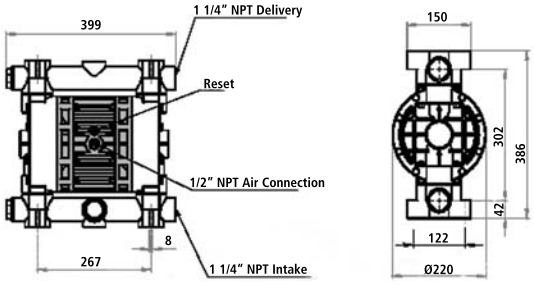


The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

SPECIFICATIONS

Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1 1/4" NPT Female
Air connection: 1/2" NPT Female
Max. self-priming capacity: 5 meters (16.4 ft)
Max. flow rate: 220 l/min (58.1 GPM)
Max. head: 70 m (99.7 PSI)
Max. air supply pressure: 7 bar (102 PSI)
Max. diameter of passing solids: 5 mm (0.197")
Net Weight: PP, 12 Kg; PVDF, 14 Kg; Alu, 16 Kg; AIS316 21 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH
Example: B150AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B150	P= Polypropylene FC= PVDF+CF AL= Aluminum A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N,A PVDF T, A Aluminum T,D,N,A AISI 316 SS A,T	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 R= PPS-V Pump Body / Ball Seats Polypropylene P, A, I PVDF F, I Aluminum R, I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B251 Air Operated Diaphragm Pump

Flow Rates to 340 LPM (89.8 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B251 diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

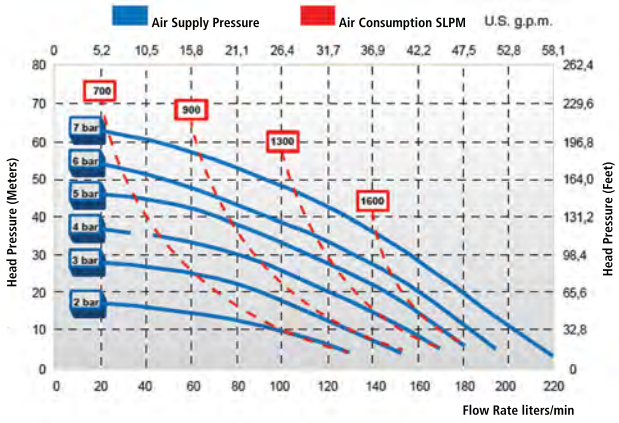
The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B251 Polypropylene

FLOW CURVES

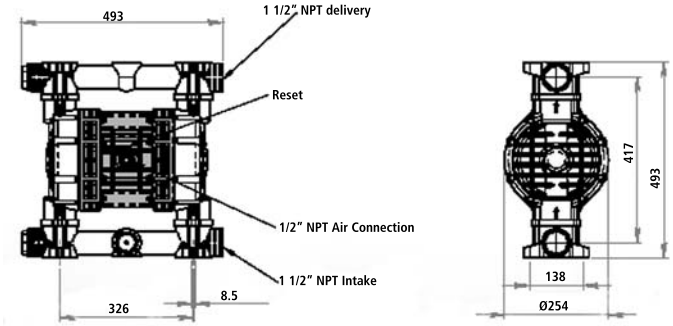


The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

SPECIFICATIONS

Pump Body Materials: PP, PVDF, Aluminum, AISI 316
Intake/delivery connections: 1 1/2" NPT Female
Air Connection: 1/2" NPT Female
Max. Self-Priming Capacity: 6 meters (19.7 ft)
Max. Flow Rate: 340 l/min (89.8 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 6 mm (0.236")
Net Weight: PP, 16 Kg; PVDF, 20 Kg; Alu, 21 Kg; AIS316 32 Kg
Max Temperature: PP, 60°C (140°F);PVDF, ALU, AISI 316, 95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH

Example: B251AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B251	P= Polypropylene FC= PVDF+CF AL= Aluminum A= AISI 316	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N,A PVDF T, A Aluminum T,D,N,A AISI 316 SS A,T	P= Polypropylene F= PVDF A= AISI 316 I= PE-UHMV L= Aluminum Pump Body / Ball Seats Polypropylene P, A, I PVDF F, I Aluminum L, I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B502 Plastic Air Operated Diaphragm Pump

Flow Rates to 650 LPM (89.8 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B502 plastic diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B502 PVDF

SPECIFICATIONS

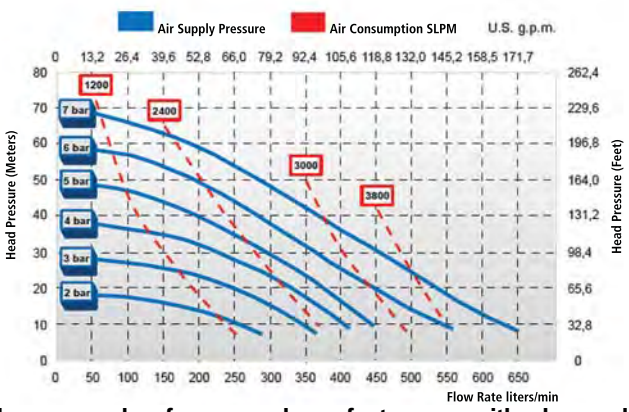
Pump Body Materials: PP, PVDF
Intake/delivery Connections: 2" NPT Female
Air Connection: 1/2" NPT Female
Max. Self-Priming Capacity: 4 meters (13.17 ft)
Max. Flow Rate: 650 l/min (89.8 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 8 mm (0.315")
Net Weight: PP, 48 Kg; PVDF, 65 Kg
Max Temperature: PP, 60°C (140°F);PVDF, 95°C (203°F)

ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification II 3/3 GD c IIB T135°C (for zone 2)

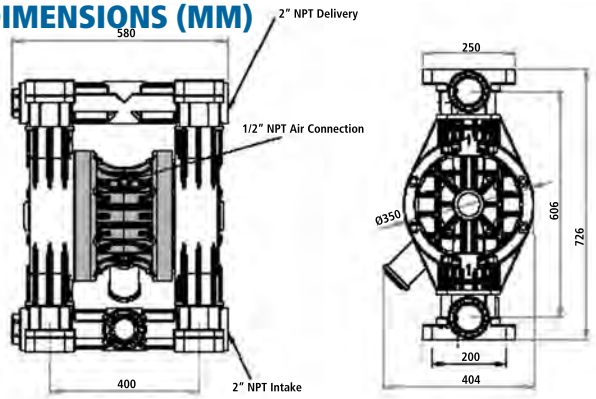
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). II 2/2 GD c IIB T135°C (for zone 1)

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH

Example: B502FCMTTFV

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B502	P= Polypropylene FC= PVDF+CF	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N,A PVDF T, A	P= Polypropylene F= PVDF I= PE-UHMV Pump Body / Ball Seats Polypropylene P, I PVDF F	D= EPDM V= Viton	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B502 Metal Air Operated Diaphragm Pump

Flow Rates to 650 LPM (89.8 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B502 metal diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B502 Aluminum

SPECIFICATIONS

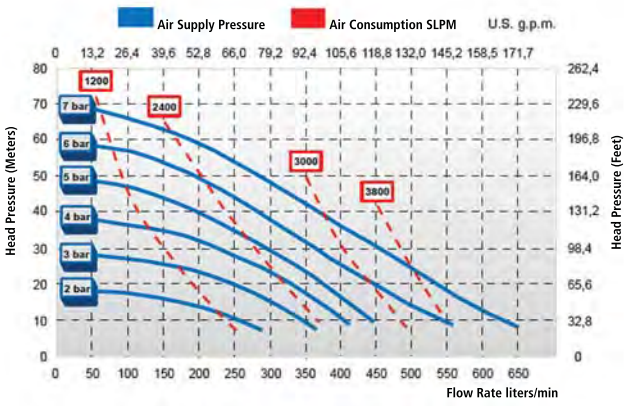
Pump Body Materials: Aluminum, AISI 316 SS
Intake/delivery Connections: 2" NPT Female
Air Connection: 1/2" NPT Female
Max. Self-Priming Capacity: 4 meters (13.17 ft)
Max. Flow Rate: 650 l/min (89.8 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 8 mm (0.315")
Net Weight: Al, 49 Kg; AISI 316, 54 Kg
Max Temperature: 95°C (203°F)

ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing. ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)

CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

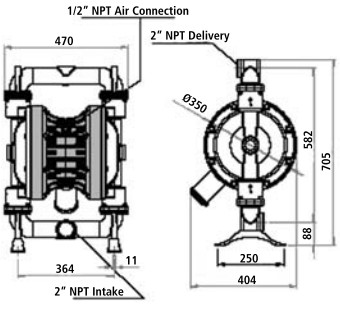
FLOW CURVES



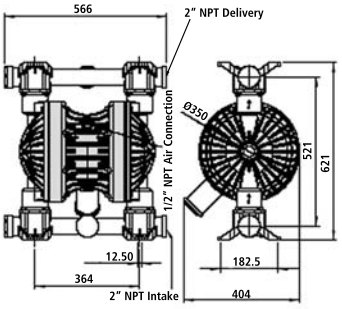
The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)

B502 AISI 316



B502 Aluminum



ORDERING INFORMATION

ABCDEFGH

Example: B502AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B502	AL= Aluminum A= AISI 316	H= Hytrel® M= Santoprene®	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Aluminum T,D,N,A AISI 316 SS A,T	D= EPDM I= PE-UHMV A= AISI 316 L= Aluminum Pump Body / Ball Seats Aluminum L,D,I AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B503 Plastic Air Operated Diaphragm Pump

Flow Rates to 900 LPM (238 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B503 plastic diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B503 Polypropylene

SPECIFICATIONS

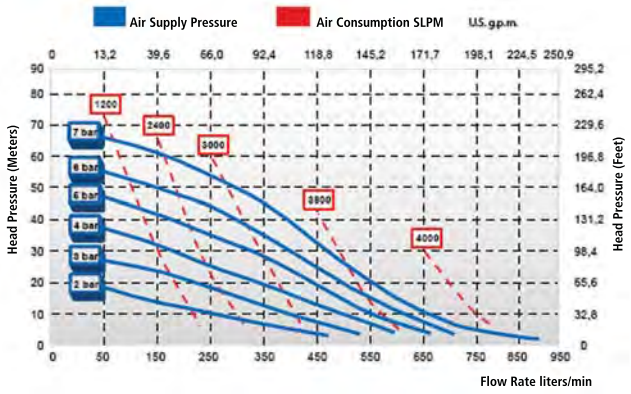
Pump Body Materials: PP, PVDF
Intake/delivery Connections: 3" NPT Female
Air Connection: 3/4" NPT Female
Max. Self-Priming Capacity: 5 meters (16.4 ft)
Max. Flow Rate: 900 l/min (238 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 10 mm (0.394")
Net Weight: PP, 50 Kg; PVDF, 67 Kg
Max Temperature: PP, 60°C (140°F);PVDF, 95°C (203°F)

ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)

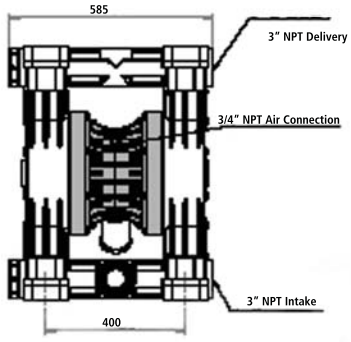
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

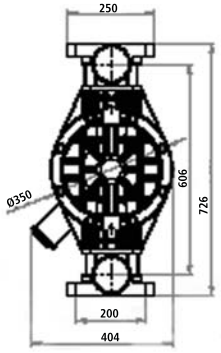
FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

DIMENSIONS (MM)





ORDERING INFORMATION

ABCDEFGH

Example: B503FCMTTFV

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B503	P= Polypropylene FC= PVDF+CF	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF pump body	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body / Balls Polypropylene T,D,N PVDF T	P= Polypropylene F= PVDF I= PE-UHMV Pump Body / Ball Seats Polypropylene P, I PVDF F	D= EPDM V= Viton	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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DEBEM

Model B503 Metal Air Operated Diaphragm Pump

Flow Rates to 900 LPM (238 GPM), Pressure to 70 Meters (99.7 PSI)

DESCRIPTION

B503 metal diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

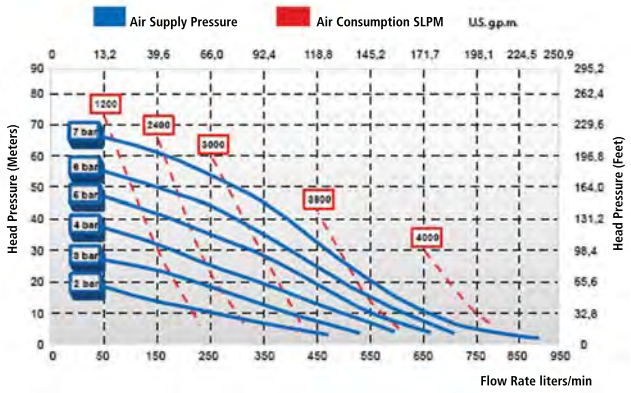
The stall-prevention pneumatic system assures a safe running pump and it does not require lubricated air. Self-priming dry capacity even with considerable suction head, fine tuning of speed without pressure loss and the possibility of dry operation without suffering damage mean that these pumps offer unrivalled versatility.

In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).

B503 AISI 316 SS

FLOW CURVES



The curves and performance values refer to pumps with submerged suction and a free delivery outlet with water at 20°C, and vary according to the construction material.

SPECIFICATIONS

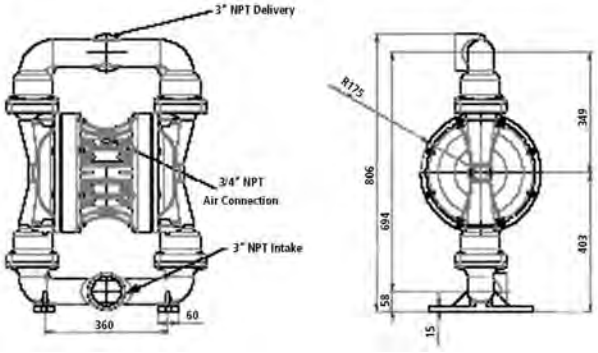
Pump Body Materials: Aluminum, AISI 316 SS
Intake/delivery Connections: 3" NPT Female
Air Connection: 3/4" NPT Female
Max. Self-Priming Capacity: 5 meters (16.4 ft)
Max. Flow Rate: 900 l/min (238 GPM)
Max. Head: 70 m (99.7 PSI)
Max. Air Supply Pressure: 7 bar (102 PSI)
Max. Diameter of Passing Solids: 10 mm (0.394")
Net Weight: Aluminum, 66 Kg; AISI 316 SS, 71 Kg
Max Temperature: 95°C (203°F)

ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing. ATEX Classification ⟨Ex⟩ II 3/3 GD c IIB T135°C (for zone 2)

CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDEFGH

Example: B503AHTTAT

A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	H Options
B503	AL= Aluminum A= AISI 316	H= Hytrel® M= Santoprene®	T= PTFE	N= NBR A= AISI 316 T= PTFE D= EPDM Pump Body — Balls Aluminum — T,D,N AISI 316 SS — A,T	N= NBR I= PE-UHMV A= AISI 316 L= Aluminum D= EPDM Pump Body — Ball Seats Aluminum — L,D,I,N AISI 316 SS — A	D= EPDM V= Viton N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

Clark Solutions • 10 Brent Drive • Hudson, MA 01749 • Tel. 978 / 568 3400 • Fax 978 / 568 0060

DEBEM

Model EQ 51 Automatic Diaphragm Pulsation Dampener

Use with MID, CU15 & MICR Air Operated Diaphragm Pumps

DESCRIPTION

EQ 51 automatic diaphragm pulsation dampeners feature solid construction and high performance. They are fitted to the discharge line of diaphragm pumps in order to smooth pulsating flows and can be used with liquids having high apparent viscosity even if containing suspended solids of considerable size.

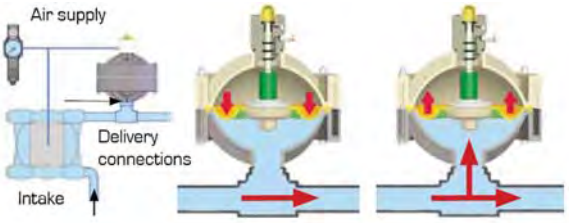
EQ 51 dampeners automatically adapt to system conditions without the need for manual adjustment or calibration.The ability to minimize pulsations, vibrations and water hammer means that this component provides excellent protection and smooth system flow.

The huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

Dampeners are also available for use in potentially explosive atmospheres (ATEX certification).

EQ51 Polypropylene

A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



HOW IT WORKS

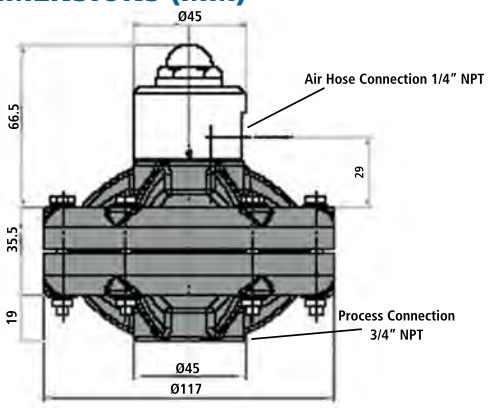
The compressed air entering the back-pressure chamber behind the diaphragm creates a pneumatic cushion that adjusts automatically to compensate the shock produced by the pressure pulse of the fluid generated by the pump.

SPECIFICATIONS

Body Materials: PP, PVDF, PPS-V
Process Connection: 3/4" NPT Female
Air Connection: 1/4" NPT Female
Max. Air Supply Pressure: 7 bar (102 PSI)
Net Weight: PP, 0.5 Kg; PVDF, 0.5 Kg; PPS-V, 0.5 Kg
Max Temperature: PP, 60°C (140°F); PVDF & PPS-V, (95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

Dampener Model	Use With Pump Model	Pump Housing Material
EQ51P (Polypropylene)	MID, CU15, MICR	PP
EQ51F (PVDF+CF)	CU15	ECTFE
	MICR	PVDF & AISI316
EQ51R (PPS-V)	MICR	ALUMINUM

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDE
Example: EQ51PHT

A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ51	P= PP FC= PVDF+CF R=PPS-V	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating

DEBEM

Model EQ 100 Automatic Diaphragm Pulsation Dampener

Use with MICR, B50, B80/81 Air Operated Diaphragm Pumps

DESCRIPTION

EQ 100 automatic diaphragm pulsation dampeners feature solid construction and high performance. They are fitted to the discharge line of diaphragm pumps in order to smooth pulsating flows and can be used with liquids having high apparent viscosity even if containing suspended solids of considerable size.

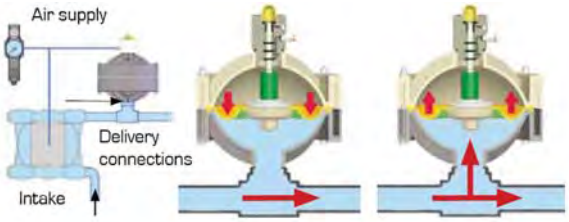
EQ 100 dampeners automatically adapt to system conditions without the need for manual adjustment or calibration.The ability to minimize pulsations, vibrations and water hammer means that this component provides excellent
protection and smooth system flow.

The huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

Dampeners are also available for use in potentially explosive atmospheres (ATEX certification).

EQ100 Polypropylene

A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



HOW IT WORKS

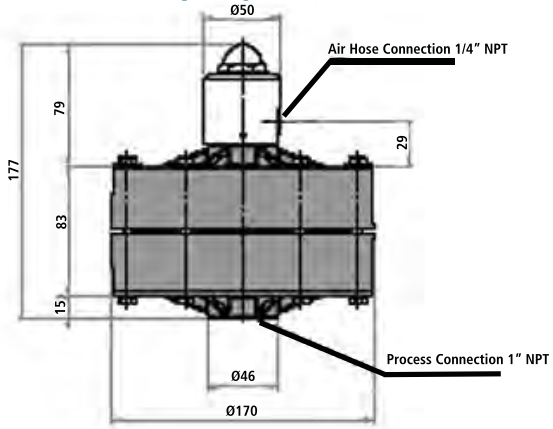
The compressed air entering the back-pressure chamber behind the diaphragm creates a pneumatic cushion that adjusts automatically to compensate the shock produced by the pressure pulse of the fluid generated by the pump.

SPECIFICATIONS

Body Materials: PP, PVDF, PPS-V
Process Connection: 1" NPT Female
Air Connection: 1/4" NPT Female
Max. Air Supply Pressure: 7 bar (102 PSI)
Net Weight: PP, 1.5 Kg; PVDF, 1.7 Kg; PPS-V, 1.75 Kg
Max Temperature: PP, 60°C (140°F); PVDF & PPS-V, (95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

Dampener Model	Use With Pump Model	Pump Housing Material
EQ100P (Polypropylene)	B50, B81	PP
EQ100 F (PVDF+CF)	MIN, B80	AISI316
	B50, B81	PVDF
EQ100R (PPS-V)	B50, B81	ALUMINUM

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDE
Example: EQ100PHT

A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ100	P= PP FC= PVDF+CF R=PPS-V	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating

DEBEM

Model EQ 200 Automatic Diaphragm Pulsation Dampener

Use with B100, B150, B251 Air Operated Diaphragm Pumps

DESCRIPTION

EQ 200 automatic diaphragm pulsation dampeners feature solid construction and high performance. They are fitted to the discharge line of diaphragm pumps in order to smooth pulsating flows and can be used with liquids having high apparent viscosity even if containing suspended solids of considerable size.

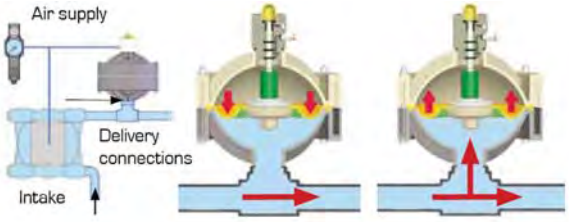
EQ 200 dampeners automatically adapt to system conditions without the need for manual adjustment or calibration.The ability to minimize pulsations, vibrations and water hammer means that this component provides excellent
protection and smooth system flow.

The huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

Dampeners are also available for use in potentially explosive atmospheres (ATEX certification).

EQ200 Polypropylene

A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



HOW IT WORKS

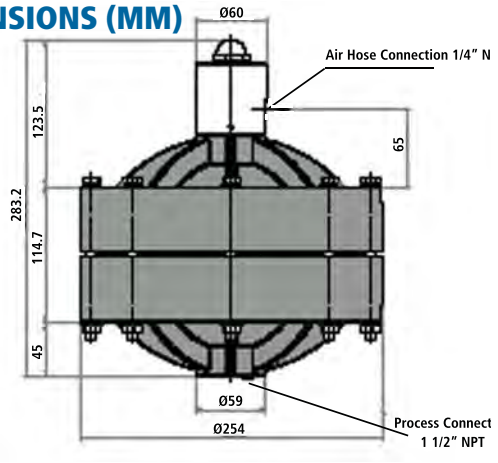
The compressed air entering the back-pressure chamber behind the diaphragm creates a pneumatic cushion that adjusts automatically to compensate the shock produced by the pressure pulse of the fluid generated by the pump.

SPECIFICATIONS

Body Materials: PP, PVDF, PPS-V
Process Connection: 1 1/2" NPT Female
Air Connection: 1/4" NPT Female
Max. Air Supply Pressure: 7 bar (102 PSI)
Net Weight: PP, 3.8 Kg; PVDF, 4.5 Kg; PPS-V, 4.5 Kg
Max Temperature: PP, 60°C (140°F); PVDF & PPS-V, (95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩II 2/2 GD c IIB T135°C (for zone 1)

Dampener Model	Use With Pump Model	Pump Housing Material
EQ200P (Polypropylene)	B100, B150, B251	PP
EQ200F (PVDF+CF)	B150, B251, B100	AISI316
	B150, B251	PVDF
EQ200R (PPS-V)	B100, B150, B251	ALUMINUM

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDE
Example: EQ200PMT

A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ200	P= PP FC= PVDF+CF R=PPS-V	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating

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DEBEM

Model EQ 302 Automatic Diaphragm Pulsation Dampener

Use with B502 Air Operated Diaphragm Pumps

DESCRIPTION

EQ 302 automatic diaphragm pulsation dampeners feature solid construction and high performance. They are fitted to the discharge line of diaphragm pumps in order to smooth pulsating flows and can be used with liquids having high apparent viscosity even if containing suspended solids of considerable size.

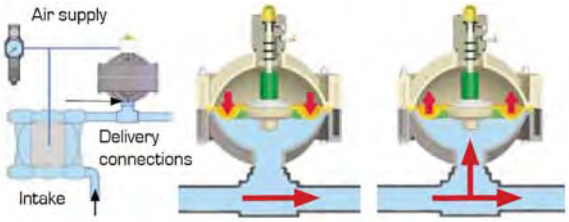
EQ 302 dampeners automatically adapt to system conditions without the need for manual adjustment or calibration.The ability to minimize pulsations, vibrations and water hammer means that this component provides excellent
protection and smooth system flow.

The huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

Dampeners are also available for use in potentially explosive atmospheres (ATEX certification).

EQ302 Polypropylene

A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



HOW IT WORKS

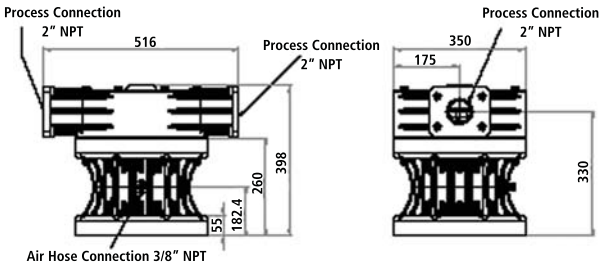
The compressed air entering the back-pressure chamber behind the diaphragm creates a pneumatic cushion that adjusts automatically to compensate the shock produced by the pressure pulse of the fluid generated by the pump.

SPECIFICATIONS

Body Materials: PP, PVDF, AISI316 SS, Aluminum
Process Connection: 2" NPT Female
Air Connection: 3/8" NPT Female
Max. Air Supply Pressure: 7 bar (102 PSI)
Net Weight: PP, 23 Kg; PVDF, 28.5 Kg; AISI 316, 32 Kg; Aluminum, 26 Kg
Max Temperature: PP, 60°C (140°F); PVDFAISI 316 & Aluminum, (95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

Dampener Model	Use With Pump Model	Pump Housing Material
EQ302P (Polypropylene)	B502	PP
EQ302F (PVDF+CF)	B502	PVDF
EQ302A (AISI 316 SS)	B502	AISI316
EQ302AL (Aluminum	B502	ALUMINUM

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDE
Example: EQ302PMT

A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ302	P= PP FC= PVDF+CF A= AISI 316 AL= Aluminum	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating

DEBEM

Model EQ 303 Automatic Diaphragm Pulsation Dampener

Use with B503 Air Operated Diaphragm Pumps

DESCRIPTION

EQ 303 automatic diaphragm pulsation dampeners feature solid construction and high performance. They are fitted to the discharge line of diaphragm pumps in order to smooth pulsating flows and can be used with liquids having high apparent viscosity even if containing suspended solids of considerable size.

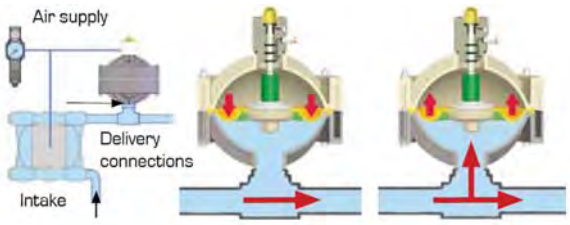
EQ 303 dampeners automatically adapt to system conditions without the need for manual adjustment or calibration.The ability to minimize pulsations, vibrations and water hammer means that this component provides excellent
protection and smooth system flow.

The huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

Dampeners are also available for use in potentially explosive atmospheres (ATEX certification).

EQ303 Polypropylene

A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



HOW IT WORKS

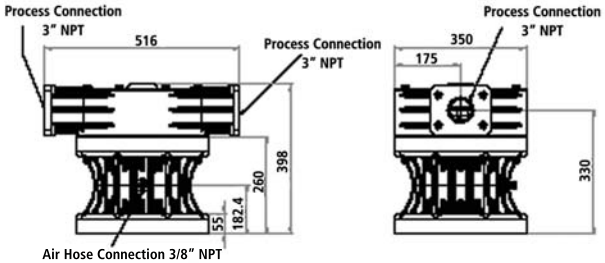
The compressed air entering the back-pressure chamber behind the diaphragm creates a pneumatic cushion that adjusts automatically to compensate the shock produced by the pressure pulse of the fluid generated by the pump.

SPECIFICATIONS

Body Materials: PP, PVDF, AISI316 SS, Aluminum
Process Connection: 3" NPT Female
Air Connection: 3/8" NPT Female
Max. Air Supply Pressure: 7 bar (102 PSI)
Net Weight: PP, 23 Kg; PVDF, 28.5 Kg; AISI 316, 35 Kg; Aluminum, 29 Kg
Max Temperature: PP, 60°C (140°F); PVDFAISI 316 & Aluminum, (95°C (203°F)
ATEX Ratings:
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.
ATEX Classification ⟨Ex⟩II 3/3 GD c IIB T135°C (for zone 2)
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). ⟨Ex⟩ II 2/2 GD c IIB T135°C (for zone 1)

Dampener Model	Use With Pump Model	Pump Housing Material
EQ303P (Polypropylene)	B503	PP
EQ303F (PVDF+CF)	B503	PVDF
EQ303A (AISI 316 SS)	B503	AISI316
EQ303AL (Aluminum	B503	ALUMINUM

DIMENSIONS (MM)



ORDERING INFORMATION

ABCDE
Example: EQ303PMT

A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ303	P= PP FC= PVDF+CF A= AISI 316 AL= Aluminum	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating

VERDER
Introduction to Peristaltic Pumps
The Verder Advantage

HOW A PERISTALTIC PUMP OPERATES

Peristalsis is one of the oldest pump designs. Early Greeks used the word peristalsis to describe the operation of a wave of automatic contractions, propelling contents along body tubes to transport food and body waste. Simply substitute with thermoplastic tube and rollers for contraction and we have the peristaltic pump. By mechanical simulation the tube walls are squeeezed together to form a seal as the roller moves along the tube. The previously compressed tube regains original form and sucks fluid/gas into the formed vacuum to create a self-priming function.

The fluid/gas will follow the rollers until the tube is no longer compressed and by this time a 2nd or even 3rd roller is compressing the tube, preventing back flow and pushing the initial dose of fluid/gas out of the pump. By a repetitive operation as the rollers rotate, we are creating a pumping movement which has an element of pulsing as a standard. By the squeezing of the tube the rotor creates suction lift and outlet pressure.

Peristaltic pumps designed and manufactured by Verder all operate with the roller and tube assembly creating a movement of liquid through 180°. Other forms of peristalsis would create this movement through 120° but generally in such instances the flow volume is much reduced.

Consideration should be given regarding the delivery pressure required from a peristaltic pump, as most peristaltic pumps operate with a delivery pressure of less than 15 PSIG unless some form of exceptionally thick wall or reinforced tubing is used.

WHAT IS UNIQUE ABOUT VERDER

One of the early unique features of the Verder concept for peristaltic pumps was the development of a cartridge system- patented world-wide by the company. With the cartridge system on the 1000 and 2000 series pumpheads Verder users enjoy two important advantages:

a) Tube changes in seconds
b) Tube locked in position- no creeping in use. Set up errors eliminated.

WHY PERISTALTIC?

- o Automatically Self Priming
- o No Backflow or siphoning
- o Pumped Media Only Contacts Tube
- o No Clogging
- o Hygienic- No Contamination
- o Can Run Dry For Limited Periods
- o No Valves Or Seals
- o Positive Displacement
- o Minimal parts wear, other than tube

Tube cartridges are available in autoclavable polysulfone or clear K-resin which can be sterilized by gamma irradiation or ethylene oxide. The tube stays in the cartridge during the sterilization process.

Tube creep from the pressure of the rotating rollers is eliminated by utilizing a dovetail section of tube that is locked into the cartridge by ultrasonic welding.

When fatigue wears the tube simply unclip the old cartridge and clip onto position a new cartridge. No other adjustment is necessary. All pumps are factory set for correct occlusion and a further development is the use of tapered rollers for simplicity and accuracy.

WHY VERDER

- o Large Variety Of Drive Units
- o Easy Load/Change Cartridges
- o Interchangeable Pumpheads
- o Single And Multi-flow Units
- o Customer Specials Not a Problem
- o Competitive Prices
- o Strong Quality Program-ISO 9001

STANDARDS

Verder products are designed and approved to the following specifications and comply with CE directives:
89/392/EEC; 73/23/EEC; 89/336/EEC; FDA 21 CFR 1772600; USPXXl CLASS Vl; NSF Std No. F51; NWRC No. 8703067; EN60529 (IEC529); BS2757 CLASS B,E,F (IEC85); BS5000 Pt. 11 (IEC72); EN603351 (IEC335-1)

VERDER

Tubing for Peristaltic Pumps

The Verder Advantage

Verder Peristaltic pumps, following the standards applied by Verder, use the highest possible grade of peristaltic pump tubing. The performance of a peristaltic pump is very often judged upon the durability of the tube used, therefore a high quality, correctly sized tube is critical. The following are the standard tubes used and carried as stock.

Verder places great emphasis on tube wall thickness and a number of tubes offered use an extremely thick wall to enhance durability and the handling of viscous fluids, as well as improving suction lift.

TUBE MATERIALS

Silicone A translucent medical/food grade tubing which is odorless, non-toxic, and has FDA and USP Class VI approvals. It is autoclavable and has a temperature range up to 220ºC. Used in most general applications.
Verderprene First choice when long tube life is required. This is an opaque thermo-plastic rubber with unmatched wear resistance. It is derived from Santoprene which is a product of Monsanto Corporation. This material has FDA food grade approval, and has been further enhanced to meet the requirements and approval standards of USP Class VI criteria for medical bio-compatibility.
Viton A black, shiny, synthetic rubber with resistance to concentrated acids, solvents, ozone, radiation and temperatures up to 200º C. Viton is expensive, and while it has excellent chemical compatibility, Viton is not renowned for durability and will have a limited service life.
Tygon This tube has excellent chemical resistance, handles virtually any inorganic chemical, and is one of the family of non-toxic tubes. Tygon has a clear finish and is available in a limited size range.
Prothane II A transparent blue polyester polyurethane tubing which is resistant to ozone, diesel fuel, kerosene, motor oil, mild solvents, aromatic hydrocarbons, petrol and concentrated acid and alkaline solutions. Temperature range is -40 to 182ºC

OCCLUSION (SQUEEZE SETTING)

By stringent control of manufacturing tolerances Autoclude is able to utilize the most cost effective fixed roller system with occlusion factory set and no adjustment necessry.

TUBE SIZES

Silicone I.D. & Wall (mm)	Autoprene I.D. & Wall (mm)	Viton I.D. & Wall (mm)	Tygon I.D. & Wall (mm)	Prothane II I.D. & Wall (mm)
1.6 x 1.6	1.6 x1.6	3.2 x 1.6	3.2 x 1.6	3.2 x 1.6
3.2x 1.6	1.8 x 3.2	5.0 x 1.6	4.8 x 1.6	4.8 x 1.6
4.0 x 1.6	3.2 x 1.6	6.0 x 2.0	6.3 x 3.2	6.3 x 3.2
5.0 x 1.6	4.0 x 1.6	8.0 x 2.4	9.5 x 3.2	12.7 x 3.2
6.3 x 1.6	4.8 x 1.6	9.5 x 3.2	12.7 x 3.2	
6.3 x 2.4	6.3 x 2.4	12.7 x 3.2		
6.3 x 3.2	6.0 x 3.2			
8.0 x 1.6	8.0 x 2.4			
8.0 x 2.4	8.0 x 3.2			
8.0 x 3.2	9.5 x 3.2			
9.5 x 3.2	12.7 x 3.2			
12.7 x 3.2	16.0 x 4.8			
14.5 x 4.5	19.0 x 4.8			
16.0 x 3.2				
16.0 x 4.8				

CONSIDER

1) Thin wall or medium wall thickness tubes perform excellent service in a variety of applications.
2) Thick wall tubing has even better suction lift and discharge pressure performance and is ideal for use when pumping viscous liquids to enable the tube to recover original shape quickly.
3) Silicone and Autoprene should be considered first as they are the most cost effective materials.
4) Largest tube size and lowest gearbox speed will give the longest tube life

TUBE LIFE

Tube life will be affected by factors such as temperature, back pressure, pump speed, and chemical compatability of the tube carrying a pumped medium. Some suggestions to optimize tube life are:

1) Minimize suction lift
2) Minimize back pressure by eliminating unnecessary restrictions in outlet tube.
3) Consider larger bore tubing on discharge side to reduce pulsation.
4) Try to keep temperatures low.
5) Lower gearbox speeds result in longer tube life. Halve the speed, approx. double the tube life.
6) Prolonged dry running will reduce tube life.
7) Pump tubing will not last forever. Anticipate tube life and establish a maintenance schedule for tube replacement.

TUBE STANDARDS

Medical/food quality
USA Food & Drug Administration (FDA) Listings under 21 CFR 177 2600
United States Pharmacopoeia (USP) XXI Class VI Approval for bio-compatibility.
USA National Sanitation Foundation (NSF) Listed under Standard No. F51 for use in food equipment (Autoprene only).
National Water Council approval under NWRC No. 8703067 (Silicone only)

TAKASAGO

Model RP-Q1 Miniature Peristaltic Pump

DC Power, 0.45 ml/min

DESCRIPTION

Model RP-Q1 peristaltic pump is uniquely compact and designed for intermittent duty where 500 hours is considered to be adequate life for the pump.

The pump consumes very little power (0.12 W) and operates on 3 VDC.

The tube material supplied is 1.5 mm ID silicone.

The pump is useful in fluid transfer applications in a wide range of automated chemistry applications.

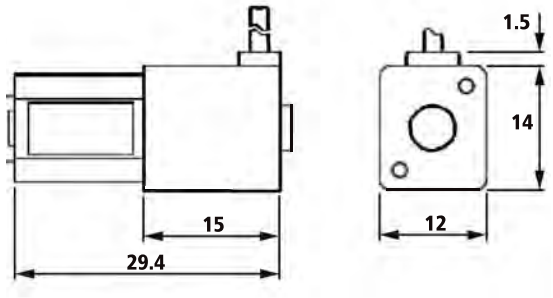
RP-Q1

SPECIFICATIONS

GENERAL

Discharge Rate: 0.45 ml/min ±15 % (tap water at 20°C)
Discharge Pressure: 50 kPa (7.26 psi)
Tube Material:Silicone (I.D. 1.5 mm)
Motor: DC geared motor
Rated Voltage:3 VDC
Power Consumption: 0.12 W
Weight: 11 g

DIMMENSIONS (MM)



ORDERING INFORMATION

MODEL NUMBER
RP-Q1

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UNO

Boxer 6000 Series Peristaltic Pumps

2-12 Channels, DC Powered, Gear or Stepper Motor Driven

DESCRIPTION

6000 series peristaltic pumps are built on the unique operational principle of balancing the load on the motor and gearbox shafts. The peristaltic tubes are positioned in pairs on both sides of the rollers.

The pumps are supplied with a standard of 8 or 4 rollers per channel. The 8 rollers enhance dispense accuracy and reduce pulsation. As the 8 rollers are step offset between the stages, a link between channels in two adjacent stages will further reduce pump pulsation.

The pumps have 4 channels/tubes per stage (except for 3 mm ID tube, which has 2 tubes per stage and can be supplied in up to 3 stages).

With large supporting bearings on the front and back of the rollers, the construction is ideal for long life and maintenance free operation.

Tubing can be specified from a wide range of diameters. The color coded tube clips are manufactured to match the various tube diameters and thus eliminate the need for any adjustments.

Tube Sizes and Flow Rates
Flow Rate Based on Virgin Pharmed Tube
Water Flow @ 20°C With No Pressure

Part No.	Tube Material	Tube ID (mm)	8-Roller System		4-Roller System	
			Full Speed (ml/min)	Half Speed (ml/min)	Full Speed (ml/min)	Half Speed (ml/min)
6000.507	Pharmed	0.25	1.40	0.67	1.67	0.79
6000.506	Pharmed	0.51	5.40	2.60	6.30	3.00
6000.501	Pharmed	1.03	14.00	6.50	16.60	7.80
6000.502	Pharmed	1.52	30.50	14.40	38.50	18.40
6000.503	Pharmed	2.06	43.46	20.40	60.40	27.50
6000.505	Pharmed	2.54	58.20	29.00	88.10	43.20
6000.504*	Norprene	3.00	72.60	35.20	93.60	50.30
6000.508**	Pharmed	3.20	-	-	149.00	68.60
6000.513**	Pharmed	4.80	-	-	330.00	150.00

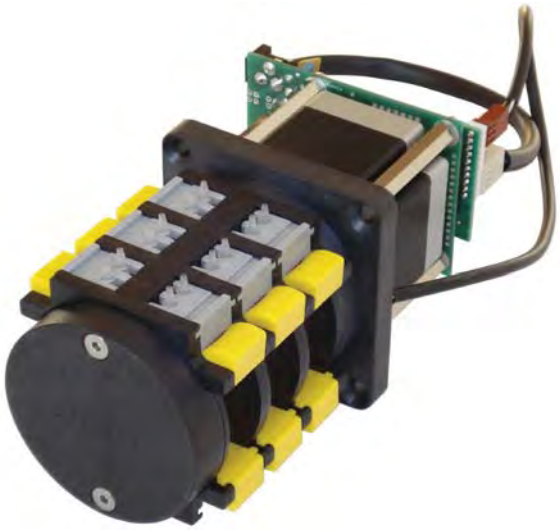
*1.0 mm tube wall, requires special clip.
**1.6 mm tube wall, requires special clip for a max two channels per pump

PUMP SPECIFICATION

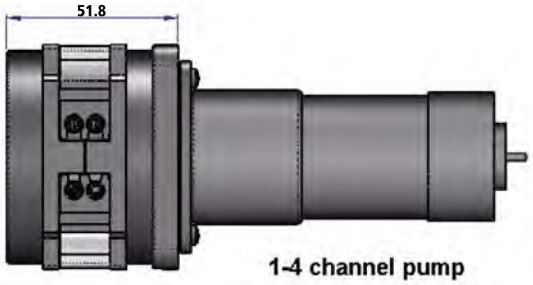
Motor: 12 or 24 VDC or NEMA 23, 24V Stepper
Rotor Speed at 12V/24V: 430 rpm
Tube Length Per Channel: 58 mm
Max. Suction Height: 8 meters W.C.
Max. Pressure: 8 meters W.C.
Max. Ambient Temp.: 40°C
Max. Media Temp.: 50°C
Tube Clips: Acetal
Pump Body: PPO (Polyphenylene Oxide)
Tube Connectors: Polypropylene
Options: Rotational encoder mounted on motor

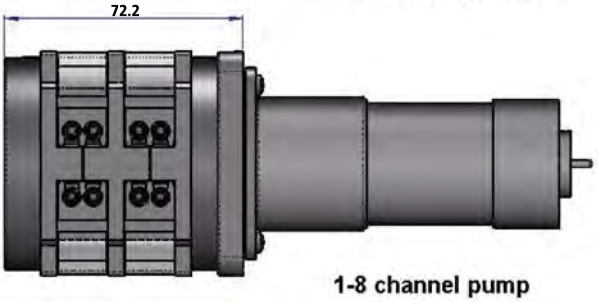
The pump head has a unique operating principle whereby the tubes are engaged with the rollers over a section of 95° only. This arrangement allows the installation of two tubes on both sides of the roller wheel with the advantage of 50% space saving, a balanced and much reduced motor load and less wear in the tubes

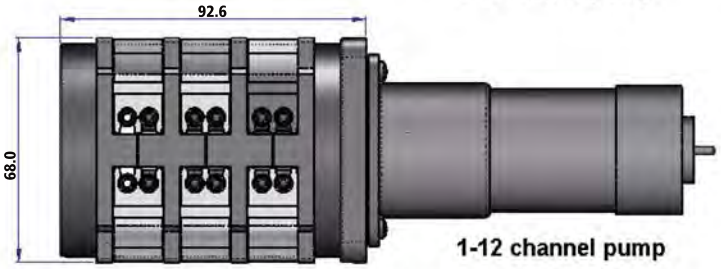
DIMENSIONS

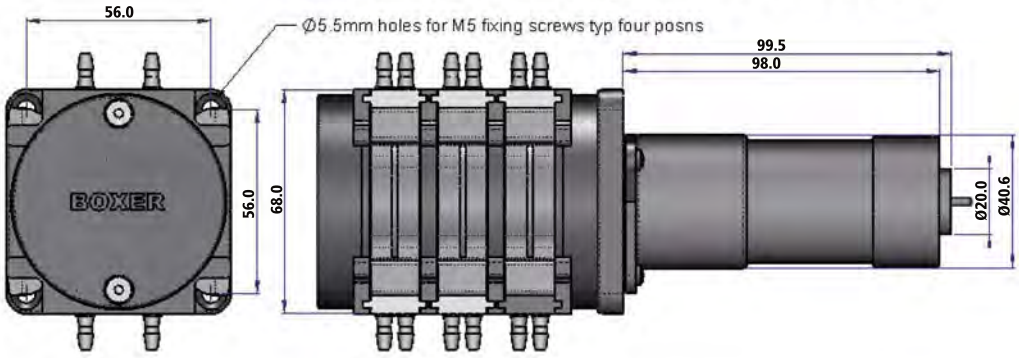


Stepper Motor Controlled Unoverse





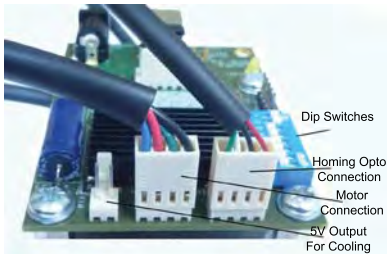




Model 6900.001 Stepper MotorControl Board
The optional CSD board (Controlled Stepper Drive) is a flexible and powerful controller for accurate dispensing. It installs directly to the back of the stepper motor or remotely.

USB interface and intuitive menu driven programming software allow for easy programming of up to 10 operating pump protocols to characterize the movement of the pump including:

-Direction
-Acceleration
-Hold Current
-Run Current
-Initial Speed
-Back Steps
-Repeat
-Stepping
-Decellerate
-Count
-Hold Current
-Final Speed
-End of cycle delay



Protocols can be chained together and repeated up to 1000 times.

One CSD board is required for each pump. The programming software can control up to 8 pumps.

Required for installation but not supplied:
1) Power Supply, 24V, 2.5A +
2) USB Cable A to B
3) PC with Windows XP, Vista or Windows 7 installed, .NET platform 2.0 min.

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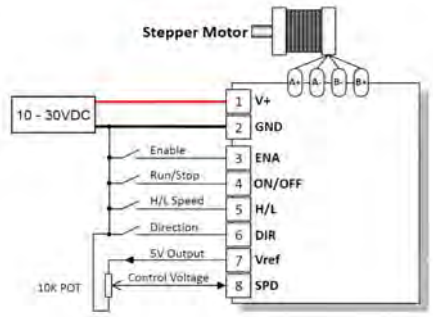
Model 6900.002 Basic Stepper Control Board
installed to back of motor with brackets or mounted remotely

Control Terminals For:

- -Stop
- -High and Low Speed
- -Change of Direction
- -Remote Speed Control Using 5-10K Pot



ORDERING INFORMATION

1) Select pump model
2) Select tubing model
3) Select any additional accessories

Model	Number of Channels/Rollers	Power
Pump Head, DC Motor & Gearbox		
6001	4/8	12V
6021	4/8	24V
6401	4/4	12V
6421	4/4	24V
6002	8/8	12V
6022	8/8	24V
6402	8/4	12V
6422	8/4	24V
6003	12/8	12V
6023	12/8	24V
6403	12/4	12V
6423	12/4	24V
Pump Head & Stepper Motor		
6131	4/8	24V
6141	4/4	24V
6132	8/8	24V
6142	8/4	24V

Model	Tubing/Accessories
6000.501	Pharmed tubing, 1.03 mm I.D., set of 4 with connectors
6000.502	Pharmed tubing, 1.52 mm I.D., set of 4 with connectors
6000.503	Pharmed tubing, 2.06 mm I.D., set of 4 with connectors
6000.504	Neoprene tubing, 3.0 mm I.D., set of 4 with connectors
6000.505	Pharmed tubing, 2.54 mm I.D., set of 4 with connectors
6000.506	Pharmed tubing, 0.51 mm I.D., set of 4 with connectors
6000.507	Neoprene tubing, 3.2 mm I.D., set of 4 with connectors
6000.508	Pharmed tubing, 3.2 mm I.D., set of 4 with connectors
6000.513	Pharmed tubing, 4.8 mm I.D., set of 2 with connectors
6000.550	Motor encoder for 6000, two channels, 7 positions, supplied on motor
6900.001	Basic Stepper Motor Control Board
6900.002	Stepper Motor Control Board, USB Interface

VERDER

M045 Peristaltic Pump

1.6, 3.2, 4.0 mm ID Tube Sizes, Flow Rate To 60 ml/min (0.9 GPH)

DESCRIPTION

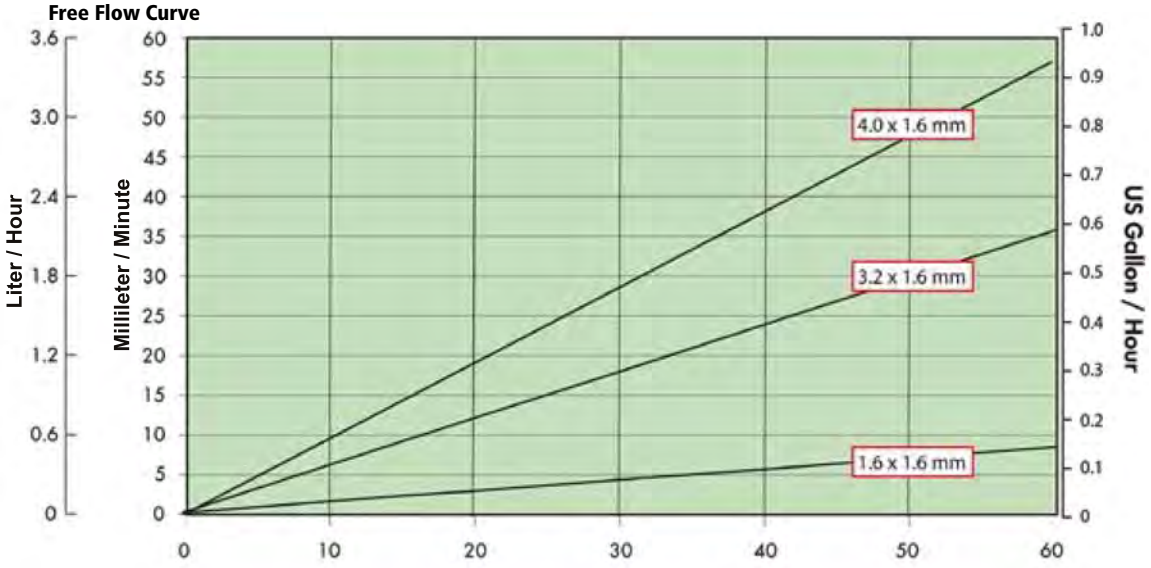
Model M045 is a versatile peristaltic pump ideal for a wide range of intermittent or continuous slow feed applications.

Designed with the Original Equipment Manufacturer in mind, the pump is a compact packaged and light in weight. A selection of tubing materials, motor choices and options address a range of media compatability and performance issues.

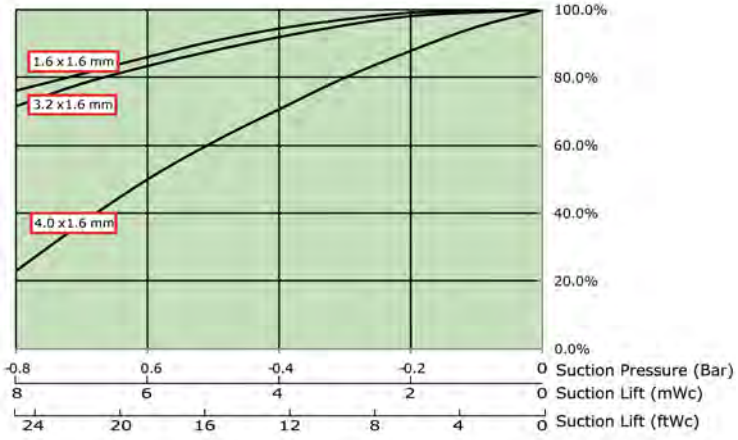
SPECIFICATIONS

Pump Head: Polycarbonate/ABS blend (blue) with clear-hinged polycarbonate cover
Rotor: 2 roller with rapid tube loading feature, polycarbonate
Motor: Permanent magnet 12VDC or 24VDC; 110 VAC 60 Hz, 230 VAC, 50 Hz (call for available AC models)
Power- 3.6 watts DC, 20 watts AC
Ovoid Gearbox Speeds (RPM): 30 or 60
Options: 3-roller
Tube: Silicone, Verderprene®; Polypropylene tube connectors provided
Tube Sizes (I.D x Wall Thickness) 1.6 x 1.6 mm, 3.2 x 1.6 mm, 4.0 x 1.6 mm

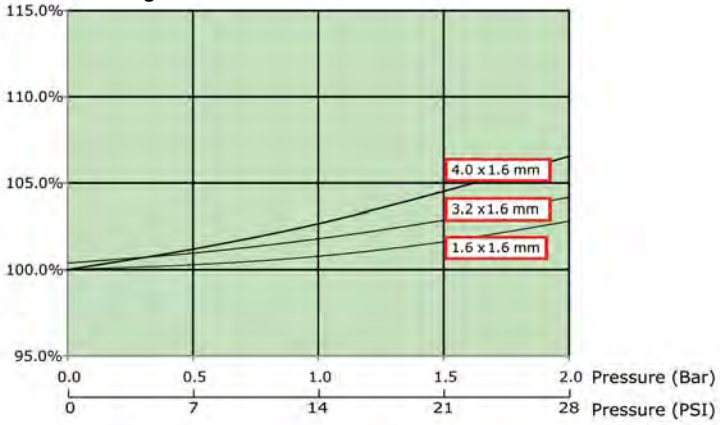
Free Flow Curve



Suction



Discharge



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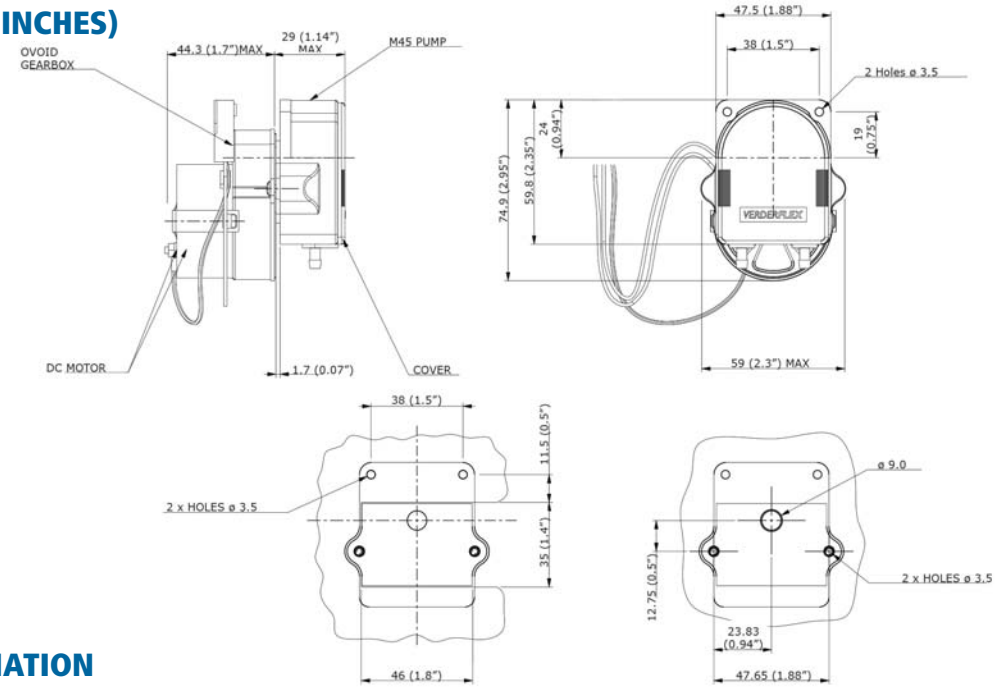
DIMENSIONS (MM, INCHES)



ORDERING INFORMATION

Pump Part Number Selection Table- Part number Includes Pump, Motor, Tube & Tube Connector				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
30 rpm	12V DC	VERDERPRENE	1.6 mm	AU M451630 04 C
			3.2 mm	AU M453030 11 C
			4 mm	AU M454030 30 C
		SILICONE	1.6 mm	AU M451630 01
			3.2 mm	AU M453030 02
			4 mm	AU M454030 02 C
	24V DC	VERDERPRENE	1.6 mm	AU M451630 08 C
			3.2 mm	AU M453030 08 C
			4 mm	AU M454030 12 C
		SILICONE	1.6 mm	AU M451630 03 C
			3.2 mm	AU M453030 10
			4 mm	AU M454030 08 C
60 rpm	12V DC	VERDERPRENE	1.6 mm	AU M451660 01 C
			3.2 mm	AU M453060 01 C
			4 mm	AU M454060 02 C
		SILICONE	1.6 mm	AU M451660 02 C
			3.2 mm	AU M453060 03 C
			4 mm	AU M454060 01 C
	24V DC	VERDERPRENE	1.6 mm	AU M451660 03 C
			3.2 mm	AU M453060 12 C
			4 mm	AU M454060 09 C
		SILICONE	1.6 mm	AU M451660 05 C
			3.2 mm	AU M453060 08 C
			4 mm	AU M454060 04 C

Replacement Tubes Including Tube Connectors (1.6 mm Wall Thickness)			
Part Number	**Tube Material**	**Tube I.D. (mm)**	**Hose Barb Connector**
AU E0583	VERDERPRENE	1.6	4.2 mm
AU E0564	VERDERPRENE	3.2	4.2 mm
AU E0761	VERDERPRENE	4.0	4.2 mm
AU E0645	SILICONE	1.6	4.2 mm
AU E0565	SILICONE	3.2	4.2 mm
AU E0554	SILICONE	4.0	4.2 mm

Spare Parts	
Part Number	**Description**
AU E0484 02	M045 2R ROTOR ASSY 1.6 ID TUBE
AU E0484 03	M045 2R ROTOR ASSY - 3.2 / 4.0 ID TUBING
AU E0485 C	M045 CYCOLOY HOUSING
AU E0486	M045 FRONT COVER

BOXER
9K & 9QQ Series Peristaltic Pumps
DC Gear or Stepper Motor, Liquid Flow to 200 ml/min

DESCRIPTION

The Boxer 9K & 9QQ compact peristaltic pump utilizes a three, four or six roller system for precise delivery of liquids to 200 ml/min. dependent on tube size and motor selected.

9QQ models incorporate a unique floating saddle to enhance tube life and/or limit pressure.

The DC motor version can optionally be provided with an integrated encoder for motor shaft position feedback for accurate dispensing of desired volumes of liquids.

Model 9K & 9QQ are offered with a choice of four and five tube diameters respectively and four tube materials as well as three roller configurations.

A unique hinged lid allows for quick removal of cover and tubing for fast and easy tube replacement.

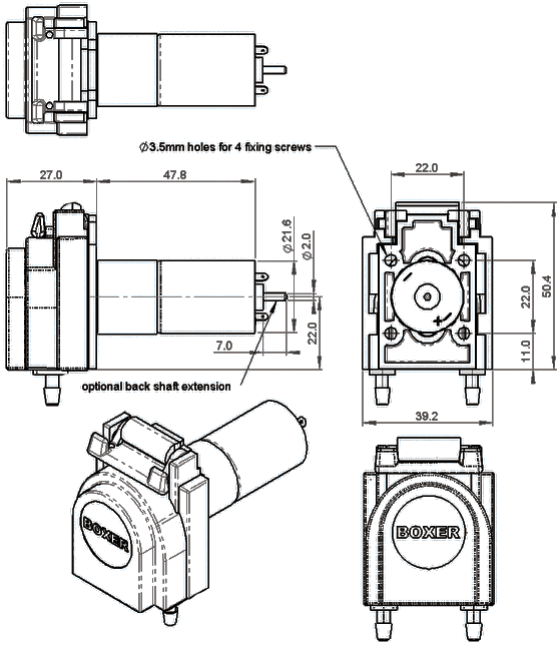
Stepper motors offer the versatility of finite speed control.

SPECIFICATIONS

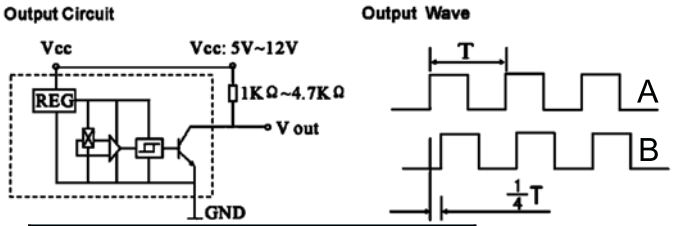
MOTOR
DC Gear Motor: 12 VDC or 24 VDC
DC Gear Motor RPM: 12 V- 116, 260 or 520
24 V- 33/107, 315 or 520
DC Motor Life: >2000 hours
Stepper Motor: NEMA 17, 24 VDC
Stepper Motor RPM: to 800 rpm dependent on tube size and number of rollers

GENERAL
Max. Pressure: 1 bar (29 PSI)
Max. Vacuum: -950 mbar (28.1 inches Hg)
Max Ambient Temp: 60°C
Flow Data:
1 mm ID Tube- 48/45/35 µl per rev. (3/4/6 rollers)
2 mm ID Tube- 160/148/106 µl per rev. (3/4/6 rollers)
3 mm ID Tube- 381/325/191 µl per rev. (3/4/6 rollers);
For stepper motor version use type 9QQ only for 3 mm ID tube size
3.5 mm ID Tube (QQ stepper motor only)-
381/325/191 µl per rev. (3/4/6 rollers)
Tube Materials: Silicone, Lagoprene, PHI or ED-Plex
Weight: 130g
Options: Back shaft motor encoder,10 pulses per motor revolution (consider gearbox ratio for pulses per pump rotor revolution)

DIMENSIONS (MM) WITH DC MOTOR

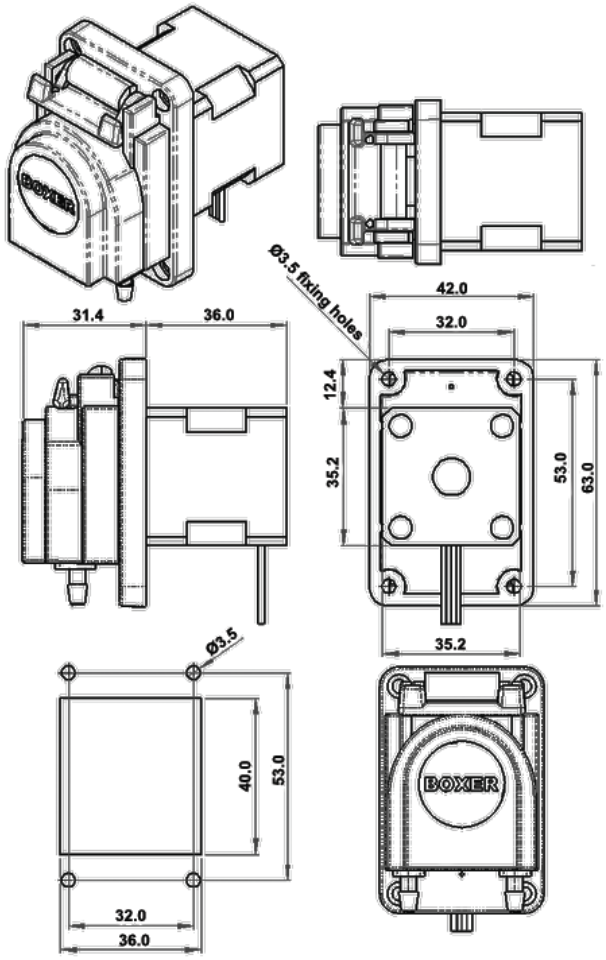


BACK SHAFT ENCODER



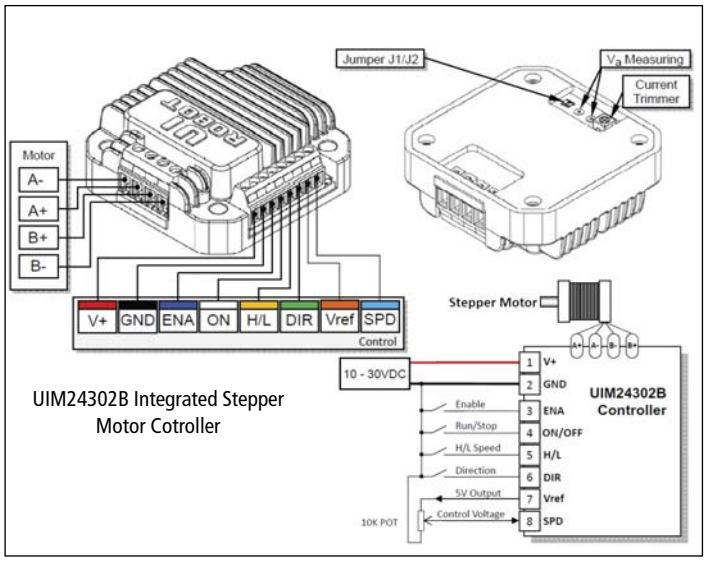
Shaft Encoder Pin Assignments			
Motor	-	Hall Sensor	Gnd
Motor	+	Hall Sensor A	V out
Hall Sensor	Vcc	Hall Sensor B	V out

DIMENSIONS (MM) WITH STEPPER MOTOR



NEMA 17 STEPPER MOTOR CONTROLLERS

ROTATIONAL SPEEDS TO 780 RPM



UIM24302B Integrated Stepper Motor Cotroller

UIM24302B stepper motor controller is a microprocessor embedded, voltage control, miniature stepper motor controller. With the UIM24302B, the motor speed can be controlled by an analog voltage via an external potentiometer or an external voltage . Run/stop, direction, high/low speed range and, enable/disable can be controlled simply by shorting the corresponding terminal to the ground.

UIM24302 can provide 0 - 2A adjustable phase current. Their mixed-decay current control reduces the back-EMF effect under high motor speed and improves the performance.

UIM24302 is mounted remote to the NEMA 17 series stepper motor. The enclosure is made of die-cast aluminum which provides a rugged durable protection and improves the heat dissipation.

Model 6900.001 Stepper Motor Control Board

The optional CSD board (Controlled Stepper Drive) is a flexible and powerful controller for accurate dispensing. USB interface and intuitive menu driven programming software allow for easy programming of up to 10 operating pump protocols to characterize the movement of a pump.

ORDERING INFORMATION

1) Select pump model
2) Select tubing model
3) Select any additional accessories

9K Models	9QQ Models	Number of Rollers	Nom. Voltage (VDC)	RPM
Pump Head, DC Motor & Gearbox				
9010.000	9010.930	3	12	116
9017.000	9017.930	3	12	260
9007.000	9007.930	3	12	520
9016.000	9016.930	3	24	33
9012.000	9012.930	3	24	107
9008.000	9008.930	3	24	315
9015.000	9015.930	3	24	520
Pump Head & Stepper Motor				
9600.003	9600.930	3	24	Max. 800
9600.004	9600.940	4	24	Max. 800
9600.006	9600.960	6	24	Max. 800

Model	Tubing/Accessories
9000.504	Silicone ID Ø 1.0 mm with PP connectors
9000.505	Silicone ID Ø 2.0 mm with PP connectors
9000.510	Silicone ID Ø 3.0 mm with PP connectors
9000.507	Silicone ID Ø 1.0 mm x 1 m (tube clips required)
9000.509	Silicone ID Ø 2.0 mm x 1 m (tube clips required)
9000.508	Silicone ID Ø 3.0 mm x 1 m (tube clips required)
9000.512	Lagoprene ID Ø 1.0 mm with PP connectors
9000.513	Lagoprene ID Ø 2.0 mm with PP connectors
9000.558	Lagoprene ID Ø 3.0 mm with PP connectors
9000.521	Lagoprene ID Ø 1.0 mm x 1 m (tube clips required)
9000.506	Lagoprene ID Ø 2.0 mm x 1 m (tube clips required)
9000.564	Lagoprene ID Ø 3.0 mm x 1 m (tube clips required)
*9000.567	PHI ID Ø 0.5 mm with PP connectors

Model	Tubing/Accessories
9000.531	PHI ID Ø 1.0 mm with PP connectors
9000.532	PHI ID Ø 2.0 mm with PP connectors
9000.565	PHI ID Ø 3.0 mm with PP connectors
*9000.566	PHI ID Ø 0.5 mm x 1 m (tube clips required)
9000.535	PHI ID Ø 1.0 mm x 1 m (tube clips required)
9000.536	PHI ID Ø 2.0 mm x 1 m (tube clips required)
9000.537	PHI ID Ø 3.0 mm x 1 m (tube clips required)
9000.525	ED-Plex ID Ø 1.0 mm with PP connectors
9000.526	ED-Plex ID Ø 2.0 mm with PP connectors
9000.520	ED-Plex ID Ø 3.0 mm with PP connectors
9000.522	ED-Plex ID Ø 1.0 mm x 1 m (tube clips required)
9000.523	ED-Plex ID Ø 2.0 mm x 1 m (tube clips required)
9000.524	ED-Plex ID Ø 3.0 mm x 1 m (tube clips required)
9000.601	Tube clip for 1mm continuous tube, set of 2
9000.610	Tube clip for 1mm continuous tube x 2 channel, set of 2
9000.602	Tube clip for 2mm continuous tube, set of 2
9000.603	Tube clip for 3 and 3.5 mm continuous tube, set of 2
9000.613	9K Mounting Bracket (DC Gear Motor Only)
6900.001	Remote Stepper Motor Control Board, USB Interface
6900.003	UIM24302B Integrated Stepper Motor Cotroller
* 0.5 mm ID tubes for use with Model 9QQ only	

VERDER

M025 Peristaltic Pump For Intermittent Duty

1.6, 3.2 & 4.8 mm I.D. Tubing, Low Cost, DC, To 120 ml/min (1.9 GPH)

DESCRIPTION

Model M025 Low flow DC powered peristaltic pump is designed for intermittent duty applications where economy is important.

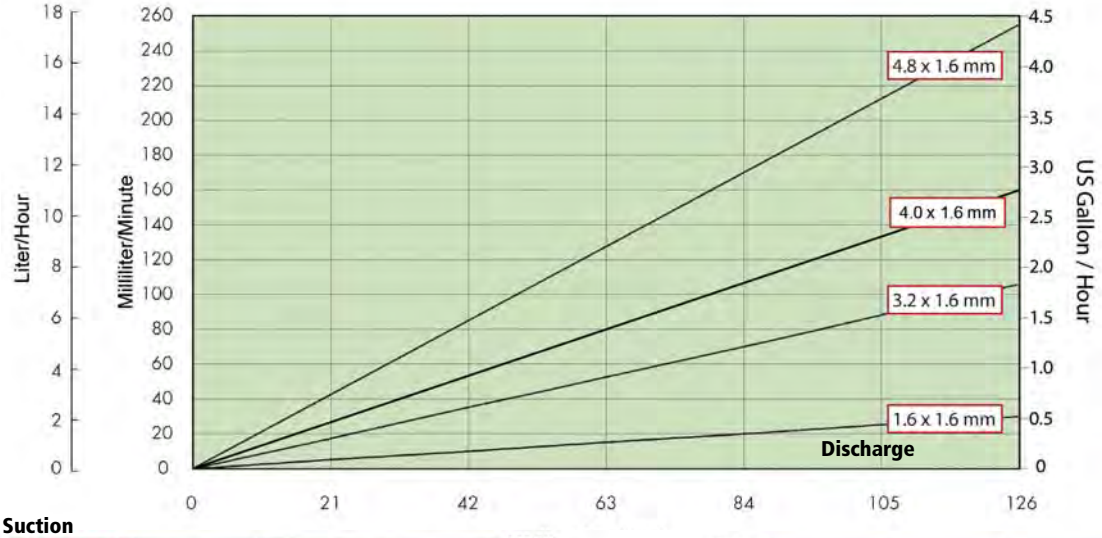
The molded case design features a hinged protective cover for easy tube change.

The pump is an ideal dosing pump for chemicals, soaps, detergents and rinse-aids as well as for condensate removal and other fluid transfer applications.

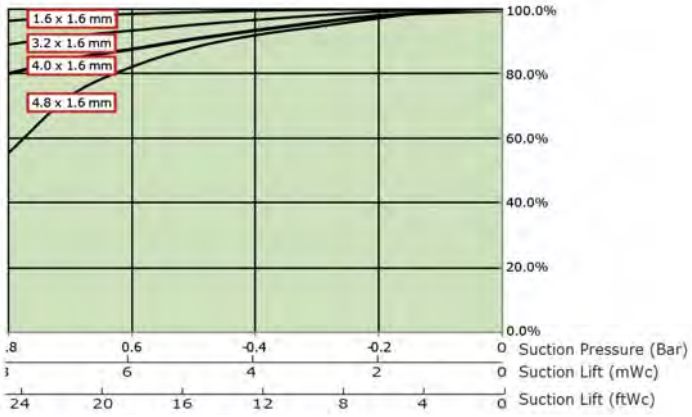
SPECIFICATIONS

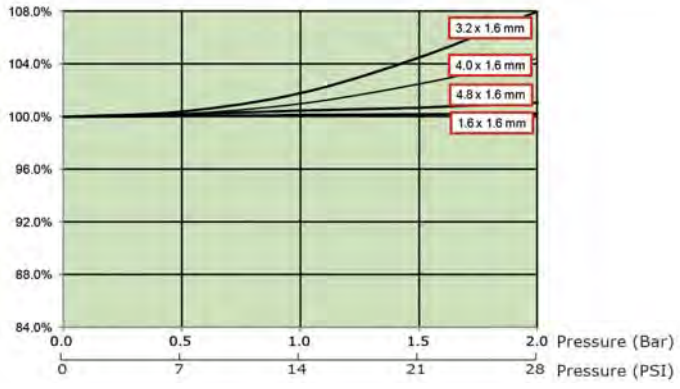
Pump Head: Polycarbonate/ABS blend (blue) with clear-hinged polycarbonate cover
Motor: Permanent magnet with spur gearbox
Rotor: 2 roller with rapid tube loading feature
Power- 12VDC or 24VDC, 15 watts
Options: 3-roller
Tube: Silicone, Verderprene®; Polypropylene tube connectors provided
Tube Sizes (I.D x Wall Thickness): 1.6 mm x 1.6 mm, 3.2 x 1.6 mm, 4.8 x 1.6 mm
Weight: 0.4 kgs (0.9 lb)

Free Flow Curve



Suction





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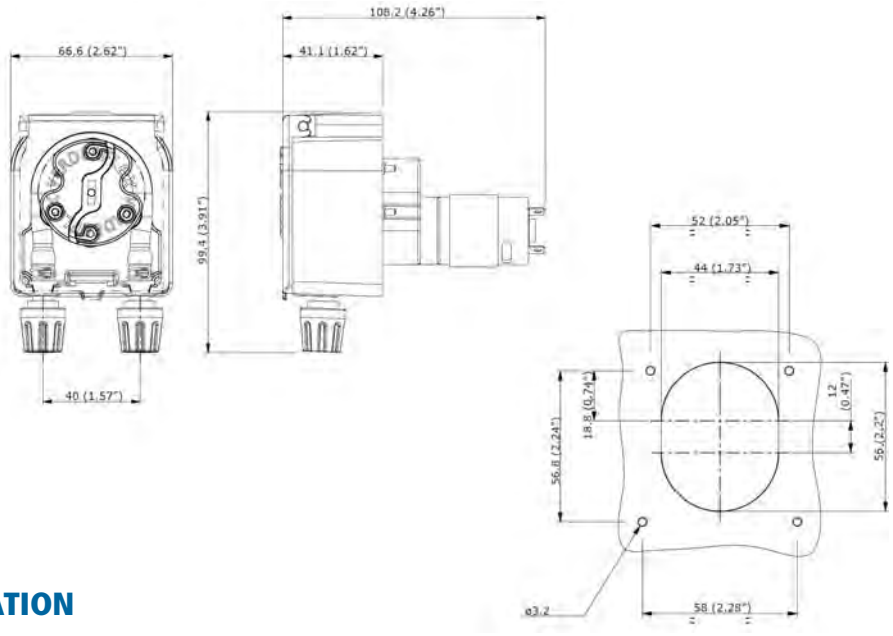
DIMENSIONS (MM, INCHES)



ORDERING INFORMATION

Pump Part Number Selection Table- Part number Includes Pump, Motor, Tube & Tube Connector				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
60 rpm	12V DC	VERDERPRENE	1.6 mm	AU R251660 01
			3.2 mm	AU R253060 06
			4.8 mm	AU R255060 01
		SILICONE	1.6 mm	AU R251660 10
			3.2 mm	AU R253060 04
			4.8 mm	AU R255060 06
	24V DC	VERDERPRENE	1.6 mm	AU R251660 02
			3.2 mm	AU R253060 02
			4.8 mm	AU R255060 03
		SILICONE	1.6 mm	AU R251660 03
			3.2 mm	AU R253060 03
			4.8 mm	AU R255060 04

Replacement Tubes Including Tube Connectors (1.6 mm Wall Thickness)			
Part Number	**Tube Material**	**Tube I.D. (mm)**	**Connection Barb Size**
AU R25 TUBE 01/A	VERDERPRENE	1.6	7 mm
AU R25 TUBE 02/A	VERDERPRENE	3.2	7 mm
AU R25 TUBE 03/A	VERDERPRENE	4.8	7 mm
AU R25 TUBE 01/S	SILICONE	1.6	7 mm
AU R25 TUBE 02/S	SILICONE	3.2	7 mm
AU R25 TUBE 03/S	SILICONE	4.8	7 mm

Spare Parts	
Part Number	**Description**
AU E2323 03	M025 2 Roller Assembly
AU E2324	M025 Clear Pump Cover, Polycarbonate
AU E2325	M025 Pump Housing (Blue)

BOXER
15KS & 15QQ Peristaltic Pump
DC Gear or Stepper Motor, Liquid Flow to 900 ml/min

DESCRIPTION

The Boxer 15KS & 15QQ peristaltic pumps utilizes a three, four or six roller system for delivery of liquids from 1.4 (lower with stepper motor) to 900 ml/min. dependent on tube size and motor selected.

The unit has a "Clip-On" pump head and the clamshell design facilitates tube change. It accommodates a continuous tube length.

The design is suitable for continuous operation. 15QQ models incorporate a unique floating saddle to enhance tube life and/or limit pressure.

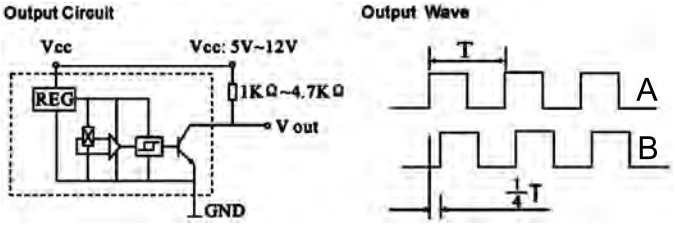
Model 15K is offered with a choice of four inside tube diameters, 1.6 mm, 2.4 mm, 3.2 mm and 4.8 mm. The unit panel mounts.

SPECIFICATIONS

MOTOR
DC Gear Motor: 12 VDC or 24 VDC
DC Gear Motor RPM: 12 V- 312 or 437
24 V- 298 or 420
DC Motor Life: >2000 hours
Stepper Motor: NEMA 23, 24 VDC
Stepper Motor RPM: to 800 rpm dependent on tube size and number of rollers
Stepper Motor Life: >10,000 hours

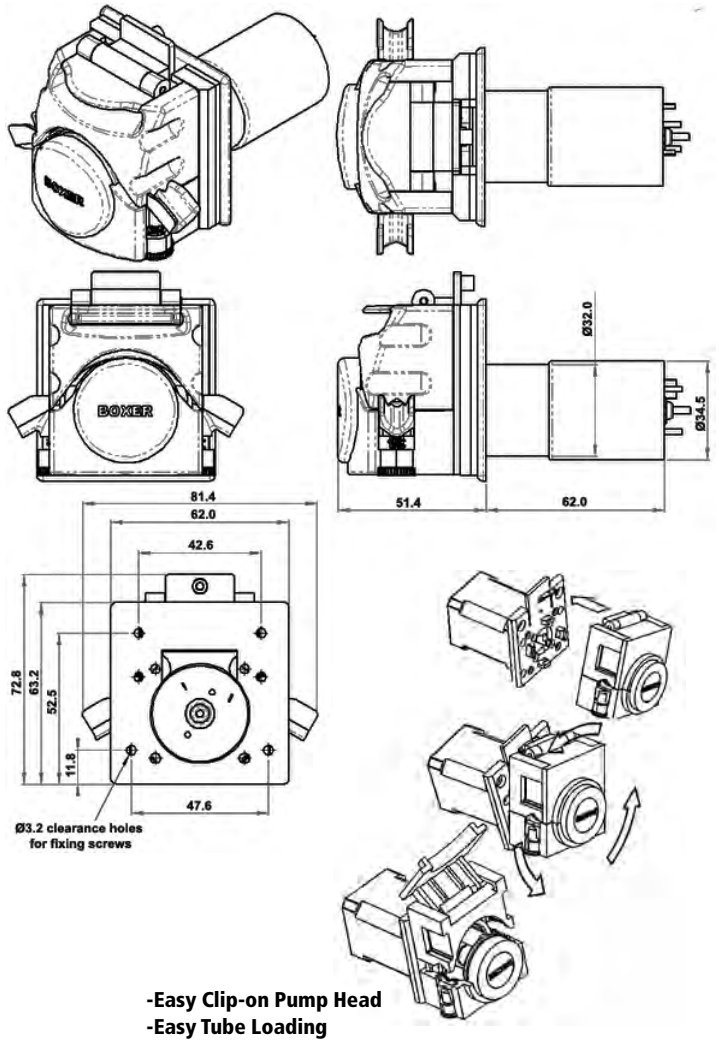
GENERAL
Max. Pressure: 2 bar (29 PSI)
Max Ambient Temp: 60°C
Flow Data:
1.6 mm ID Tube- 165/148 µl per rev. (4/6 rollers)
2.4 mm ID Tube- 320/272 µl per rev. (4/6 rollers)
3.2 mm ID Tube- 566/466 µl per rev. (4/6 rollers)
4.8 mm ID Tube - 1146/800 µl per rev. 4/6 rollers)
Tube Materials: Silicone, Neoprene G, PHI or ED-Plex
Weight: 402g
Options: Back shaft motor encoder,10 pulses per motor revolution (consider gearbox ratio for pulses per pump rotor revolution)

BACK SHAFT ENCODER



Shaft Encoder Pin Assignments			
Motor	-	Hall Sensor	Gnd
Motor	+	Hall Sensor A	V out
Hall Sensor	Vcc	Hall Sensor B	V out

DIMENSIONS (MM) WITH DC MOTOR



-Easy Clip-on Pump Head
-Easy Tube Loading

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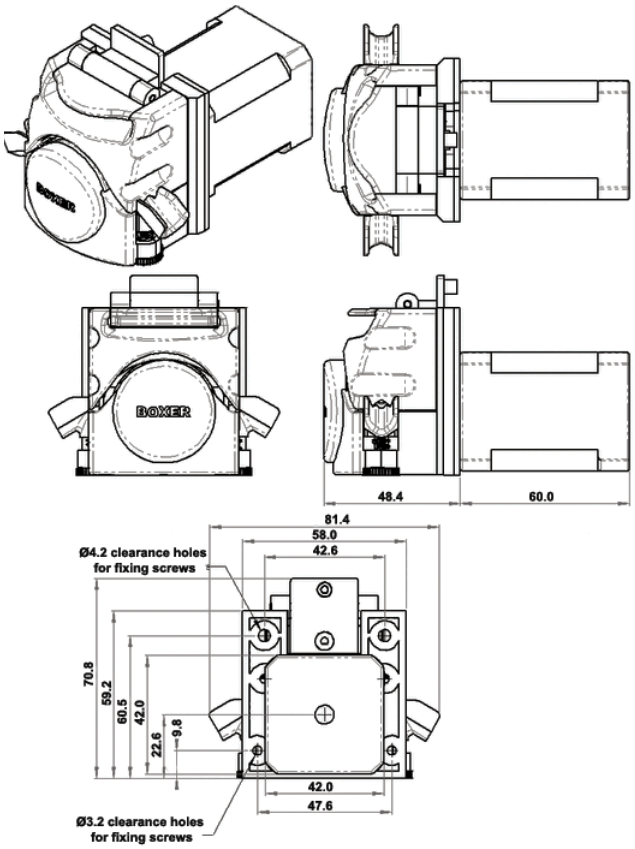
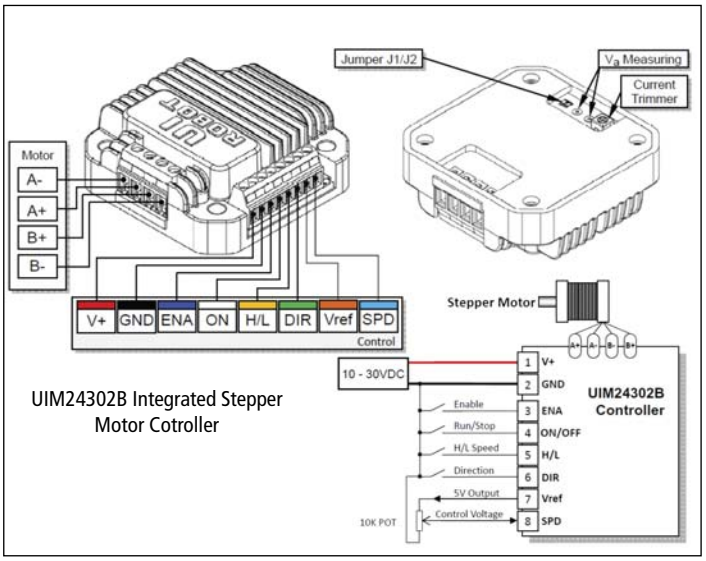
DIMENSIONS (MM) WITH STEPPER MOTOR



NEMA 23 STEPPER MOTOR CONTROLLERS

ROTATIONAL SPEEDS TO 780 RPM



UIM24302B Integrated Stepper Motor Cotroller

UIM24302B stepper motor controller is a microprocessor embedded, voltage control, miniature stepper motor controller. With the UIM24302B, the motor speed can be controlled by an analog voltage via an external potentiometer or an external voltage . Run/stop, direction, high/low speed range and, enable/disable can be controlled simply by shorting the corresponding terminal to the ground.

UIM24302 can provide 0 - 2A adjustable phase current. Their mixed-decay current control reduces the back-EMF effect under high motor speed and improves the performance.

UIM24302 can be mounted onto NEMA 23 series stepper motor seamlessly through adapting flanges. The enclosure is made of die-cast aluminum which provides a rugged durable protection and improves the heat dissipation.

Model 6900.001 Stepper Motor Control Board
The optional CSD board (Controlled Stepper Drive) is a flexible and powerful controller for accurate dispensing. USB interface and intuitive menu driven programming software allow for easy programming of up to 10 operating pump protocols to characterize the movement of a pump.

ORDERING INFORMATION

1) Select pump model
2) Select tubing model
3) Select any additional accessories

15KS Models	15QQ Models	*Number of Rollers	Nom. Voltage (VDC)	RPM
Pump Head, DC Motor & Gearbox				
15011.100	15011.900	4	12	312
15012.100	15012.900	4	12	437
15013.100	15013.900	4	24	298
15014.100	15014.900	4	24	420
Pump Head & Stepper Motor				
15602.100	15602.900	4	24	max. 800
**15652.101	**15652.901	4	24	max. 800

* Consult us for available three and six roller models
** Includes UIM24302B controller

Model	Tubing/Accessories
15000.206	Silicone ID Ø 1.6 mm x single length
15000.207	Silicone ID Ø 2.4 mm x single length
15000.208	Silicone ID Ø 3.2 mm x single length
15000.209	Silicone ID Ø 4.8 mm x single length
15000.201	Silicone ID Ø 1.6 mm x 1 m
15000.202	Silicone ID Ø 2.4 mm x 1 m
15000.203	Silicone ID Ø 3.3 mm x 1 m
15000.204	Silicone ID Ø 4.8 mm x 1 m
15000.012	Norprene G ID Ø 1.6 mm x single length
15000.013	Norprene G ID Ø 3.2 mm x single length
15000.014	Norprene G ID Ø 4.8 mm x single length
15000.015	Norprene G ID Ø 1.6 mm x 1 m
15000.016	Norprene G ID Ø 3.3 mm x 1 m
15000.017	Norprene G ID Ø 4.8 mm x 1 m

Model	Tubing/Accessories
15000.019	PHI ID Ø 1.6 mm x single length
15000.020	PHI ID Ø 2.4 mm x single length
15000.021	PHI ID Ø 3.2 mm x single length
15000.048	PHI ID Ø 4.8 mm x single length
15000.210	PHI ID Ø 1.6 mm x 1 m
15000.211	PHI ID Ø 2.4 mm x 1 m
15000.212	PHI ID Ø 3.3 mm x 1 m
15000.213	PHI ID Ø 4.8 mm x 1 m
15000.054	ED-Plex ID Ø 1.6 mm x single length
15000.056	ED-Plex ID Ø 3.2 mm x single length
15000.057	ED-Plex ID Ø 4.8 mm x single length
15000,049	ED-Plex ID Ø 1.6 mm x 1 m
15000.051	ED-Plex ID Ø 3.2 mm x 1 m
15000.052	ED-Plex ID Ø 4.8 mm x 1 m
15800.102	15KS Head Only - 4R
15800.103	15KS Head Only - 6R
15800.802	15QQ Head Only - 4R
15800.803	15QQ Head Only - 6R
15000.104	15 KS / 15QQ Rotor - 4R
15000.105	15 KS / 15QQ Rotor - 6R
6900.001	Remote Stepper Motor Control Board, USB Interface
6900.003	UIM24302B Integrated Stepper Motor Cotroller

VERDER

M500 Peristaltic Pump

1.6, 3.2, 4.8 mm ID Tube Sizes,Flow Rate To 730 ml/min (11.6 GPH)

DESCRIPTION

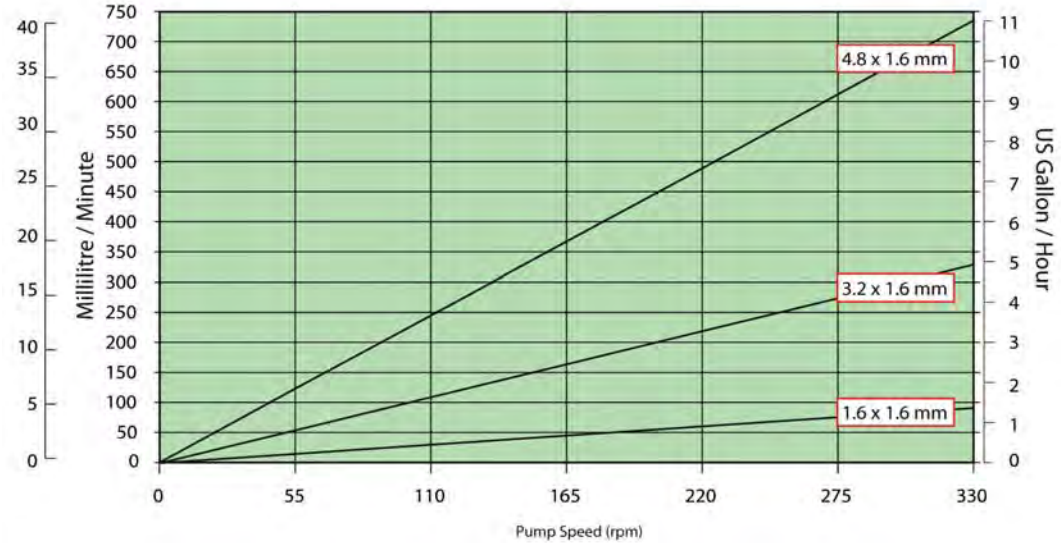
Model M500 is a versatile peristaltic pump ideal for a wide range of intermittent or continuous cycle applications.

Designed with the Original Equipment Manufacturer in mind, the pump is compactly packaged and light in weight. A selection of tubing materials, motor choices and options address a range of media compatibility and performance issues.

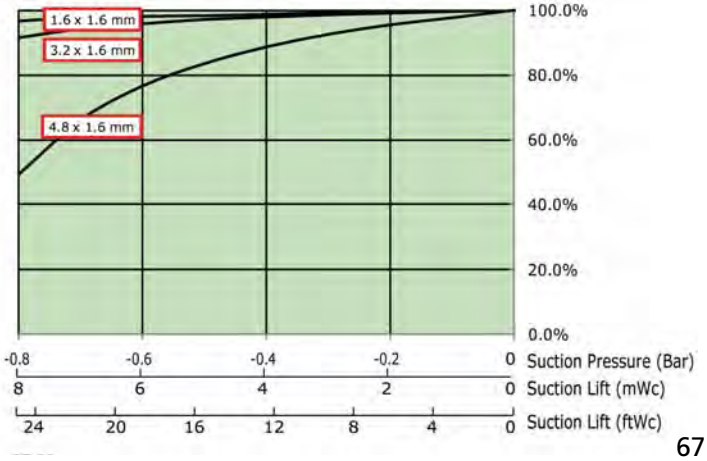
SPECIFICATIONS

Pump Head: Polycarbonate standard, Noryl optional
Rotor: 2 roller with rapid tube loading feature, polycarbonate
Motor: D.C. or Asynchronous shaded pole motor with spur gearbox , consult us for AC options
Power- 12/24V D.C. 20W: 110, 220, 230 VAC 50/60 Hz 100 - 280W
Options: 3-roller
Tube: Silicone, Verderprene®, call for other tubing; Polypropylene tube connectors provided
Tube Sizes (I.D x Wall Thickness): 1.6 mm x 1.6 mm, 3.2 x 1.6 mm, 4.8 x 1.6 mm

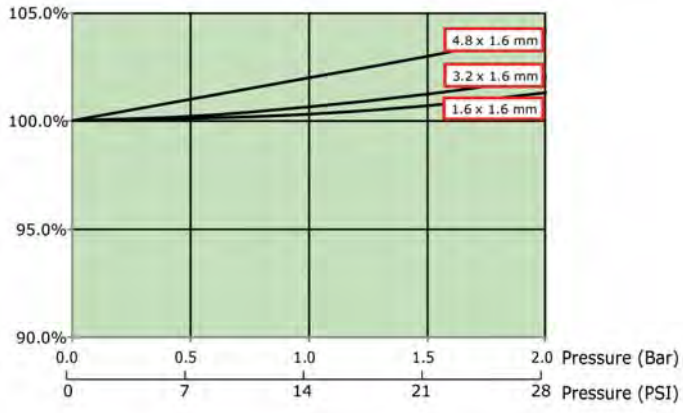
Free Flow Curve



Suction



Discharge



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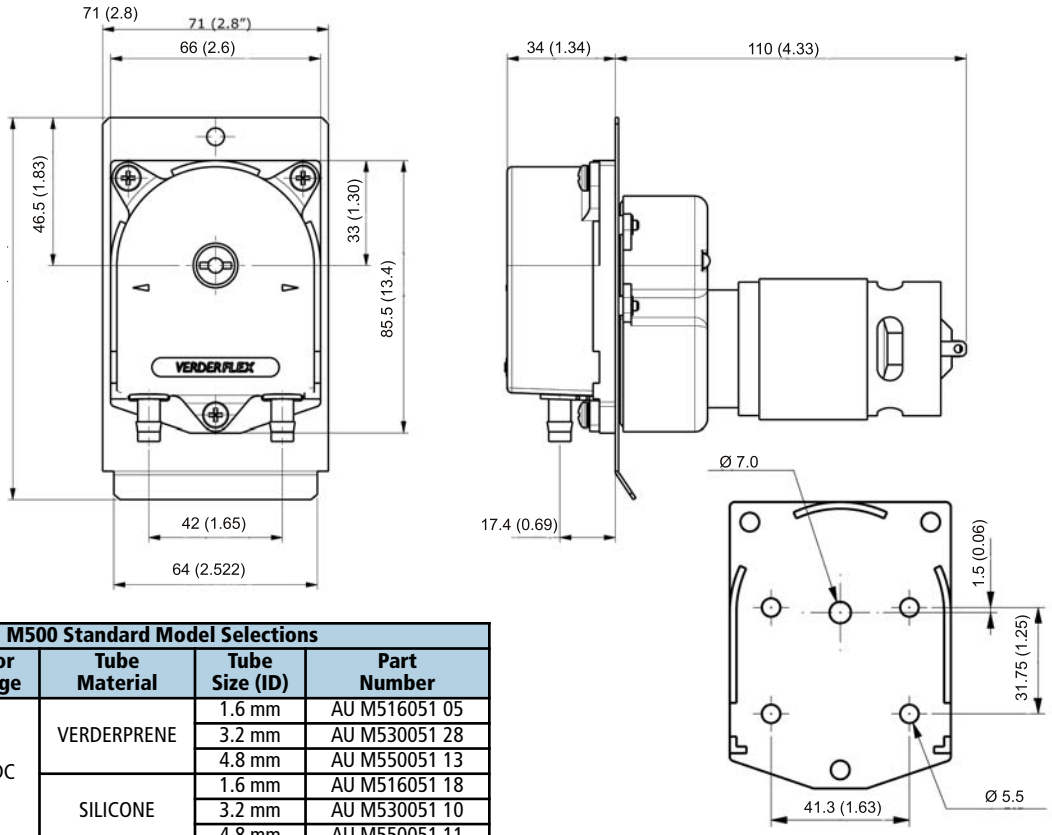
DIMENSIONS MM (INCHES)



M500 Standard Model Selections				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
51	12V DC	VERDERPRENE	1.6 mm	AU M516051 05
			3.2 mm	AU M530051 28
			4.8 mm	AU M550051 13
		SILICONE	1.6 mm	AU M516051 18
			3.2 mm	AU M530051 10
			4.8 mm	AU M550051 11
	24V DC	VERDERPRENE	1.6 mm	AU M516051 19
			3.2 mm	AU M530051 21
			4.8 mm	AU M550051 26
		SILICONE	1.6 mm	AU M516051 06
			3.2 mm	AU M530051 05
			4.8 mm	AU M550051 14
82	12V DC	VERDERPRENE	1.6 mm	AU M516082 02
			3.2 mm	AU M530082 12
			4.8 mm	AU M550082 02
		SILICONE	3.2 mm	AU M530082 08
			4.8 mm	AU M550082 38
	24V DC	VERDERPRENE	1.6 mm	AU M516082 17
			3.2 mm	AU M530082 09
			4.8 mm	AU M550082 10
		SILICONE	3.2 mm	AU M530082 17
			4.8 mm	AU M550082 68
125	12V DC	VERDERPRENE	3.2 mm	AU M530125 09
			4.8 mm	AU M550125 52
		SILICONE	3.2 mm	AU M530125 22
			4.8 mm	AU M550125 58
	24V DC	VERDERPRENE	3.2 mm	AU M530125 11
			4.8 mm	AU M550125 05
		SILICONE	3.2 mm	AU M530125 05
			4.8 mm	AU M550125 06

M500 Standard Model Selections				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
176	12V DC	VERDERPRENE	3.2 mm	AU M530176 01
			4.8 mm	AU M550176 02
		SILICONE	4.8 mm	AU M550176 31
	24V DC	VERDERPRENE	3.2 mm	AU M530176 03
			4.8 mm	AU M550176 04
		SILICONE	3.2 mm	AU M530176 10
			4.8 mm	AU M550176 30
240	12V DC	VERDERPRENE	4.8 mm	AU M550240 06
		SILICONE	4.8 mm	AU M550240 07
	24V DC	VERDERPRENE	4.8 mm	AU M550240 03
		SILICONE	4.8 mm	AU M550240 08
325	12V DC	VERDERPRENE	4.8 mm	AU M550325 07
		SILICONE	4.8 mm	AU M550325 17
	24V DC	VERDERPRENE	4.8 mm	AU M550325 13
		SILICONE	4.8 mm	AU M550325 18

Replacement Tubes Including Tube Connectors (1.6 mm Wall Thickness)			
Part Number	**Tube Material**	**Tube I.D. (mm)**	**Hose Barb Connection**
AU E0275 02	VERDERPRENE	1.6	4.2 mm
AU E0275 06	VERDERPRENE	3.2	4.2 mm
AU E0275	VERDERPRENE	4.8	7.0 mm
AU E0254 03	SILICONE	1.6	4.2 mm
AU E0254 05	SILICONE	3.2	4.2 mm
AU E0254	SILICONE	4.8	7.0 mm

Spare Parts	
Part Number	**Description**
AU E0240 02	M500 POLYCARBONATE HOUSING
AU E0241 04	M500 ROTOR ASSY FOR 1.6 ID TUBING
AU E0241 03	M500 ROTOR ASSY FOR 3.2 / 4.0 TUBING
AU E2358 ASSY 01	M500 3 ROLLER NYLON ROTOR ASSY
AU E0244 02	M500 STANDARD BACK PLATE
AU E0253 03	M500 LARGE BACK PLATE
AU E0322/A	M500 FAN (2" DIA)

AUTOCLUDE

EZ Easy Tube Loading Peristaltic Pumps

12 or 24 VDC, flow to 1260 ml/min (20 GPH)

DESCRIPTION

Easy tube loading peristaltic pumps are supplied with a 3-roller rotor for optimal fluid delivery and a 12 VDC or 24 VDC gear motor.

The pump heads are rugged fabrications of polyamide, acetal and stainless steel with an integral pump head drive shaft with dual ball race bearings. The pumps are supplied with a stainless steel mounting plate.

A selection of drive options combined with six tube sizes give a wide range of flow rates. Also, tubing in five different materials is available to accommodate various chemical compatibility demands.

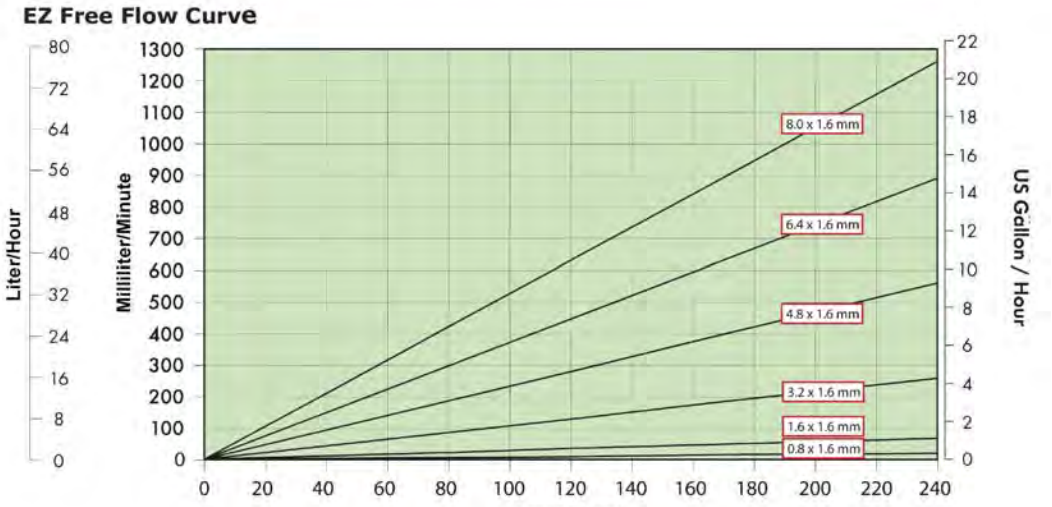
Tube change is simple and only takes seconds.

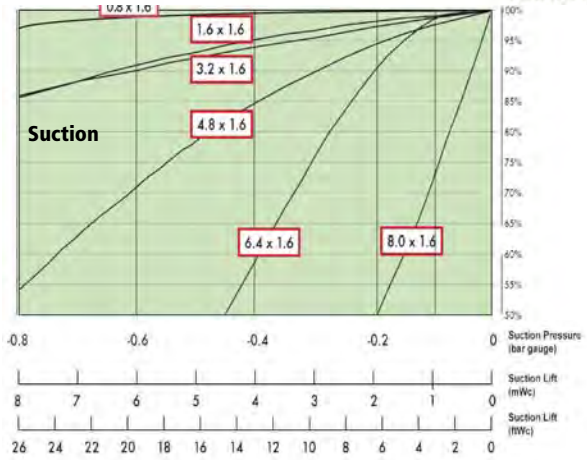
Model AUEZ 12/24 VDC

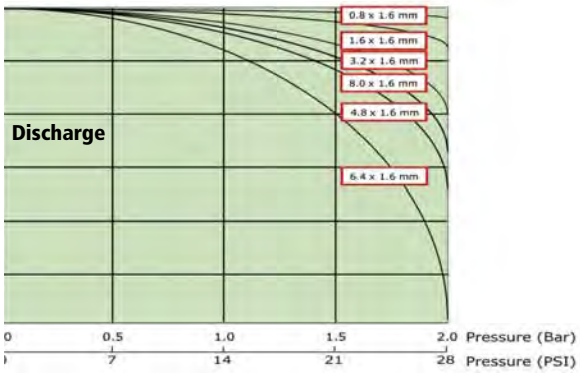
SPECIFICATIONS

Pump Head: Polyamide, acetal and stainless steel
Rotor: 2 roller with rapid tube loading feature, polycarbonate
Motor: 12VDC or 24VDC Permanent magnet with replaceable brushes, brushless motor option

Options: 3-roller
Tube: Silicone, Verderprene®, Tygon, Viton
Tube Sizes (I.D x Wall Thickness): .08 x 1.6 mm,1.6 x 1.6 mm, 3.2 x 1.6 mm, 4.8 x 1.6 mm, 6.4 x 1.6 mm and 8.0 x 1.6 mm
Weight: 1.3 kgs (2.9 lb)







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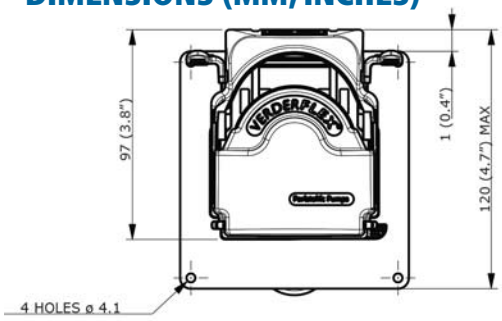
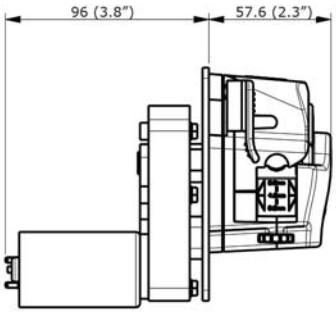
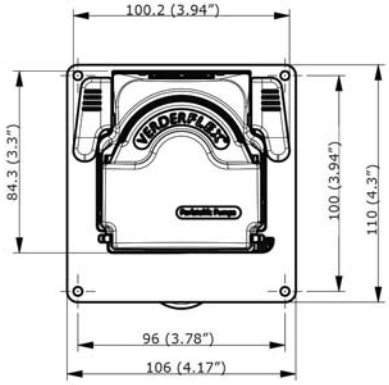
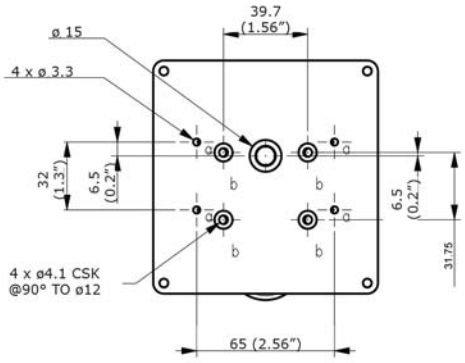
DIMENSIONS (MM, INCHES)









*EZ Standard Model Selections			
Speed (rpm)	**Motor Voltage**	**Tube Clamp Sized for Tube I.D.**	**Part Number**
60	12V DC	VARIABLE	AU EZ3R16 060 02
		1.6mm	AU EZ3R16 060 02 C2
		3.2mm	AU EZ3R16 060 02 C3
		4.0mm	AU EZ3R16 060 02 C4
		4.8mm	AU EZ3R16 060 02 C5
		6.4mm	AU EZ3R16 060 02 C6
		8.0mm	AU EZ3R16 060 02 C8
	24V DC	VARIABLE	AU EZ3R16 060 01
		1.6mm	AU EZ3R16 060 01 C2
		3.2mm	AU EZ3R16 060 01 C3
		4.0mm	AU EZ3R16 060 01 C4
		4.8mm	AU EZ3R16 060 01 C5
		6.4mm	AU EZ3R16 060 01 C6
		8.0mm	AU EZ3R16 060 01 C8
100	12V DC	VARIABLE	AU EZ3R16 100 02
		1.6mm	AU EZ3R16 100 02 C2
		3.2mm	AU EZ3R16 100 02 C3
		4.0mm	AU EZ3R16 100 02 C4
		4.8mm	AU EZ3R16 100 02 C5
		6.4mm	AU EZ3R16 100 02 C6
		8.0mm	AU EZ3R16 100 02 C8
	24V DC	VARIABLE	AU EZ3R16 100 01
		1.6mm	AU EZ3R16 100 01 C2
		3.2mm	AU EZ3R16 100 01 C3
		4.0mm	AU EZ3R16 100 01 C4
		4.8mm	AU EZ3R16 100 01 C5
		6.4mm	AU EZ3R16 100 01 C6
		8.0mm	AU EZ3R16 100 01 C8

*EZ Standard Model Selections			
Speed (rpm)	**Motor Voltage**	**Tube Clamp Sized for Tube I.D.**	**Part Number**
160	12V DC	VARIABLE	AU EZ3R16 160 02
		1.6mm	AU EZ3R16 160 02 C2
		3.2mm	AU EZ3R16 160 02 C3
		4.0mm	AU EZ3R16 160 02 C4
		4.8mm	AU EZ3R16 160 02 C5
		6.4mm	AU EZ3R16 160 02 C6
		8.0mm	AU EZ3R16 160 02 C8
	24V DC	VARIABLE	AU EZ3R16 160 01
		1.6mm	AU EZ3R16 160 01 C2
		3.2mm	AU EZ3R16 160 01 C3
		4.0mm	AU EZ3R16 160 01 C4
		4.8mm	AU EZ3R16 160 01 C5
		6.4mm	AU EZ3R16 160 01 C6
		8.0mm	AU EZ3R16 160 01 C8

*** Consult us for stackable/multi- pump head designs**

VERDER
M2000 Peristaltic Pump
Flow Rate To 1.4 l/min (22.6 GPH)

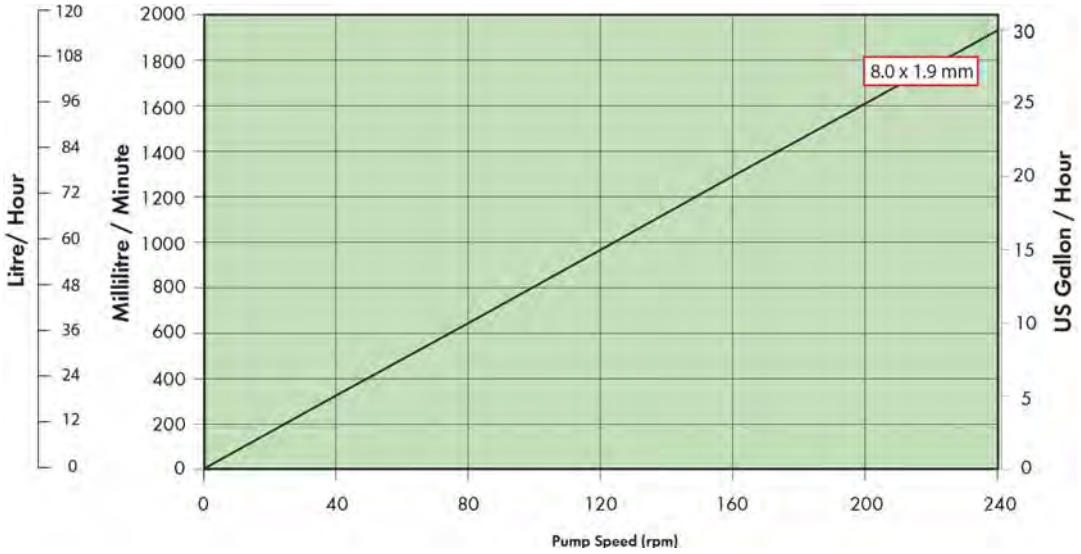
DESCRIPTION
Model M2000 is the larger of a two pump group featuring a unique and patented quick-change tube loading system. The tube cartridge can be changed easily by unclipping from the pumphead and replacing with a new cartridge.

Tube creep is eliminated through use of dove tail sectioned tubing ultrasonically welded to the tube cartridge.

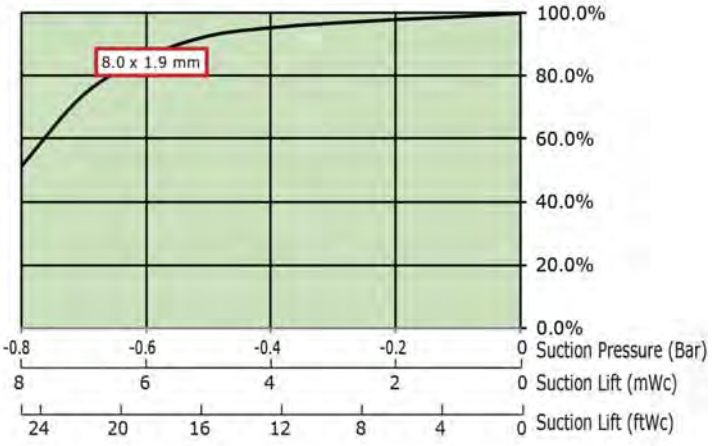
SPECIFICATIONS
Pump Head: Black polycarbonate with support bearing and mounting plate
Rotor: Polycarbonate, 316 stainless steel inserts with Nylatron® rollers
Motor: 24V D.C., 30W

Tube:
Verderprene: 8mm tube/cartridge assy
Silicone: 8mm tube cartridge assy
Tube Sizes (I.D x Wall Thickness): .8.0 x 1.9mm
Weight: 1.8 kg (4.0 lb)

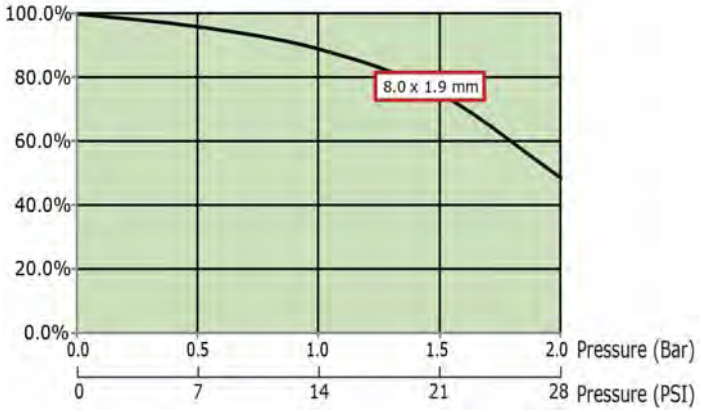
Free Flow Curve



Suction



Discharge



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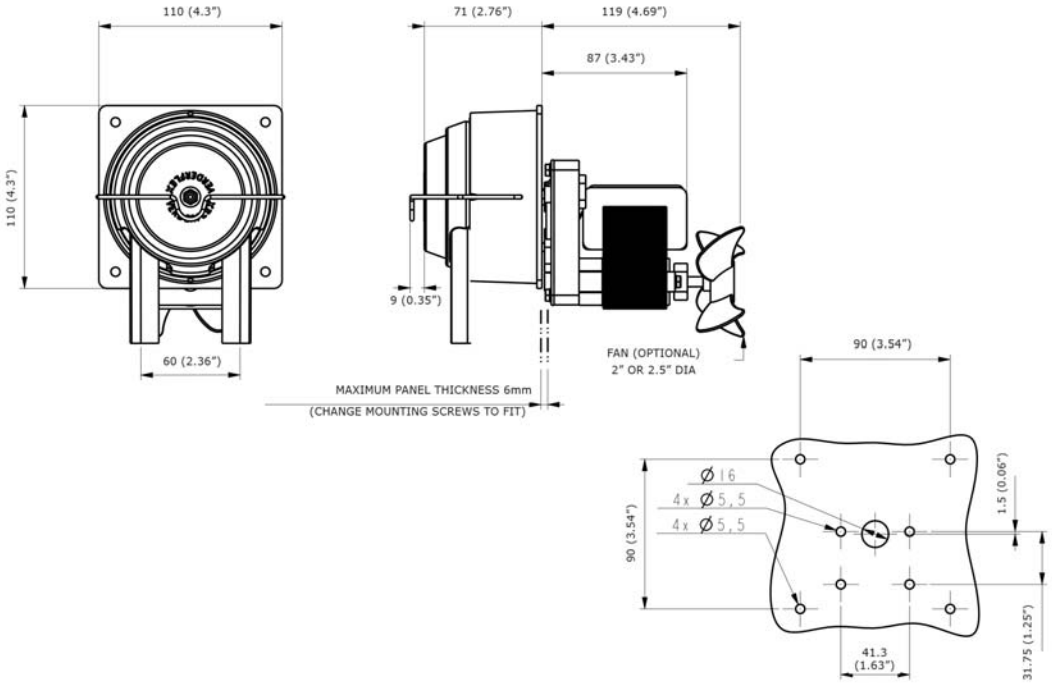
DIMENSIONS (MM, INCHES)



ORDERING INFORMATION

Pump Part Number Selection Table- Part number Includes Pump, Motor & Tube Cartridge				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
30	24V DC	VERDERPRENE	8 mm	AU M280085 14
		SILICONE	8 mm	AU M280085 16
125		VERDERPRENE	8 mm	AU M280125 26
		SILICONE	8 mm	AU M280125 02
176		VERDERPRENE	8 mm	AU M280176 17
		SILICONE	8 mm	AU M280176 15

Replacement Tubes Cartridge Assemblies			
Part Number	**Tube Material**	**Tube I.D.**	**Description**
AU E0048 2CPA 08 P	VERDERPRENE	8 mm	PACK OF 5 M2000 8MM VERDERPRENE CARTRIDGES
AU E0048 2CPS 08 P	SILICONE	8 mm	PACK OF 5 M2000 8MM SILICONE CARTRIDGES

Spare Parts	
Part Number	**Description**
AU E0075 03	M2000 HOUSING
AU E0074	M2000 POLYCARBONATE BACKPLATE
AU E0076 03	M2000 ROTOR ASSEMBLY
AU E0017	BALL RACE BRG 3/8" ID x 7/8"OD
AU E0080	M2000 CARTRIDGE RETAINING CLIP
AU E0037	FAN : COUNTER CLOCKWISE, NYLON
185.1034.P	PK 10 8/10MM BLACK PP TUBE CONNECTORS
185.1035.P	PK 10 8/10 MM WHT ACETAL TUBE CONNECTORS
AU E0066	M2000 ROTOR SETTING JIG - 8MM TUBE

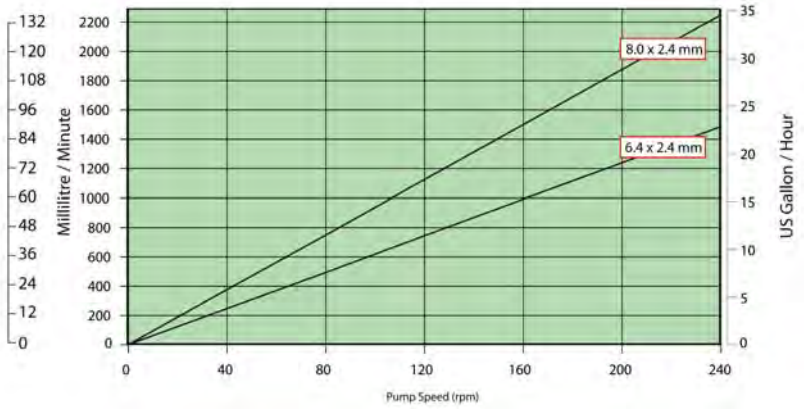
VERDER
M1500 Peristaltic Pump
Flow Rate To 1.6 l/min (26 GPH)

DESCRIPTION
Model M1500 is a rugged, dependable pump utilizing thick wall tubing for improved performance on viscous fluids. It has considerable suction lift ability.

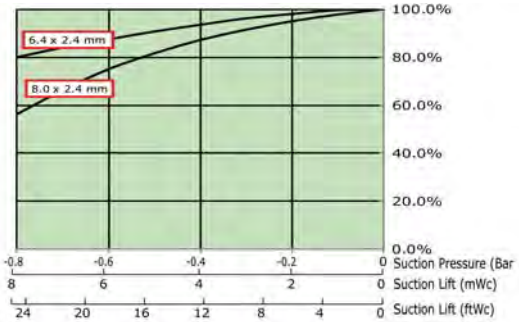
The pump is typically used for chemical dosing, vending machines, crop spraying and other fluidic applications.

SPECIFICATIONS
Pump Head: Black cycoloy with support bearing
Front Cover: Clear polycarbonate with 3 mounting screws
Rotor: 2 roller design, Nylon 6 , with Acetal polymer rollers
Motor: Permanent magnet 12Vdc or 24Vdc
Power Consumption- 30 watts
Gearbox Speeds: 82 RPM, 125 RPM, 176 RPM
Tube: Thick wall (2.4 mm) round sections Silicone & Verderprene, 6.4 mm and 8 mm I.D.; Polypropylene tube connectors provided.
Weight: 1.8 kgs (4.0 lb)

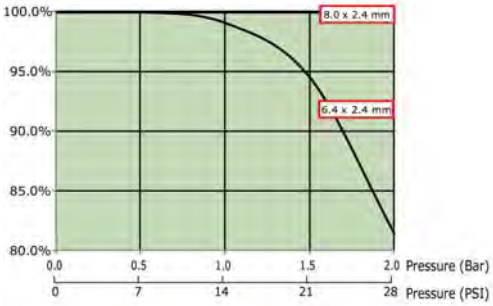
Free Flow Curve



Suction



Discharge



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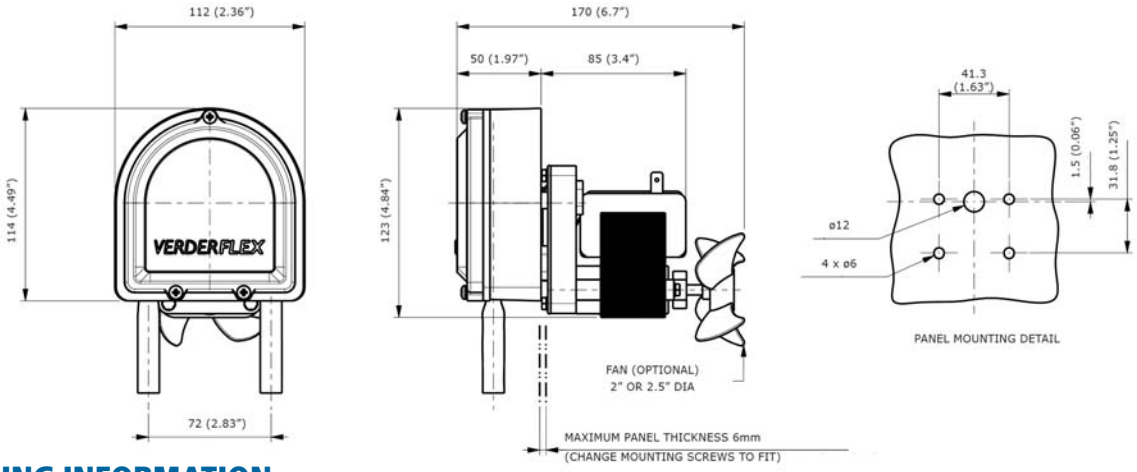
DIMENSIONS (MM, INCHES)



ORDERING INFORMATION

Pump Part Number Selection Table				
Speed (rpm)	**Motor Voltage**	**Tube Material**	**Tube Size (ID)**	**Part Number**
82	12V DC	VERDERPRENE	6.4 mm	AU R1560082 05
			8 mm	AU R1580082 12
		SILICONE	6.4 mm	AU R1560082 07
			8 mm	AU R1580082 02
	24V DC	VERDERPRENE	6.4 mm	AU R1560082 03
			8 mm	AU R1580082 04
		SILICONE	6.4 mm	AU R1560082 04
			8 mm	AU R1580082 13
125	24V DC	VERDERPRENE	6.4 mm	AU R1560125 06
			8 mm	AU R1580125 08
176	12V DC	VERDERPRENE	6.4 mm	AU R1560176 06
			8 mm	AU R1580176 18
		SILICONE	6.4 mm	AU R1560176 11
			8 mm	AU R1580176 25
	24V DC	VERDERPRENE	6.4 mm	AU R1560176 04
			8 mm	AU R1580176 07
		SILICONE	6.4 mm	AU R1560176 07
			8 mm	AU R1580176 19

Replacement Tubing			
Part Number	**Tube Material**	**Tube I.D.**	**Description**
150.0623.1	VERDERPRENE	6.4 mm	1 MTR LENGTH VERDERPRENE 6.4 ID x 2.4 WT
150.0623.15			15m ROLL VERDERPRENE 6.4 ID x 2.4 WT
150.0626.1		8 mm	1 MTR LENGTH VERDERPRENE 8.0 ID x 2.4 WT
150.0626.15			15m ROLL VERDERPRENE 8.0 ID x 2.4 WT
460.1032.1	SILICONE	6.4 mm	1 MTR LENGTH SILICONE TUBE 6.4 IDx2.4 WT
460.1032.15			15m ROLL SILICONE TUBING 6.4 ID x 2.4 WT
460.0705.1		8 mm	1 MTR LENGTH SILICONE TUBE 8.0 IDx2.4 WT
460.0705.15			15m ROLL SILICONE TUBING 8.0 ID x 2.4 WT

Spare Parts	
Part Number	**Description**
AU E1137 02	M1500 2R ROTOR ASSEMBLY
AU E1138	M1500 STANDARD HOUSING
AU E1138 02	M1500 ROBUST DC MOTOR HOUSING
AU E1139	M1500 FRONT COVER
AU E0017	BALL RACE BRG 3/8" ID x 7/8"OD
AU E0037	FAN : COUNTER CLOCKWISE, NYLON
185.1035.P	PK 10 8/10 MM WHT ACETAL TUBE CONNECTORS
185.1034.P	PK 10 8/10MM BLACK PP TUBE CONNECTORS

BOXER

4K Series Peristaltic Pumps

Single Channel, DC Motor, Flow to 3.5 l/min

DESCRIPTION

The Boxer 4K is a high performance and versatile peristaltic pump. The pump is available with roller sizes to match either 6 or 8 mm ID x 2.4 mm wall or 6.0 to 9.6 mm ID x 3.2 mm wall tubing. A set of replaceable inserts secures the vatious tube sizes firmly in position.

The hinged clear lid forms an integral part of the pump. The lid is secured in position with a quick action cam lock.

These pumps are not suitable for use with life support equipment or any in-vivo application.

SPECIFICATIONS

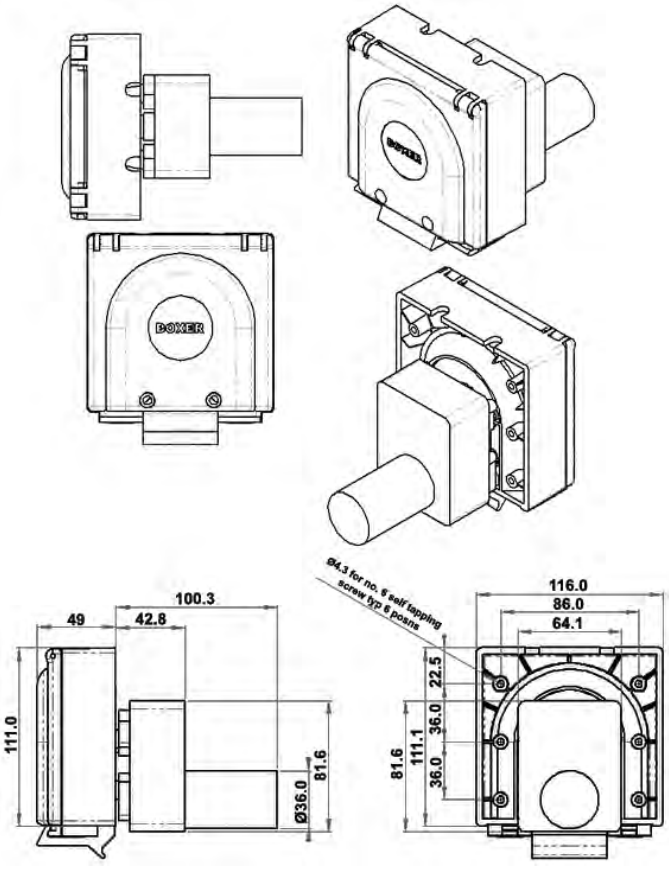
Models:
- 4000- For 6.0, 8.0 & 9.5 mm tube ID x 2.4 mm wall
- 4500- For 6.0, 8.0 & 9.5 mm tube ID x 3.2 mm wall

Flow Data:
- 6 mm ID Tube-1.9 lpm at 280 rpm
- 8 mm ID Tube- 2.4 lpm at 280 rpm
- 9.5 mm ID Tube- 3.4 lpm at 280 rpm

Tubing Materials: Lagoprene, Silicone, PHI & ED-Plex
Lid Material: Clear Polycarbonate
Rollers: 2 x Nylatron
Pump Housing Material: Glass filled Polypropylene
Roller Material: PPS Ryton
Motor: Permanent magnet 24-30VDC with spur gear box
Starting/Running Current:
- Boxer 4000- 1.1A/0.5A
- Boxer 4500- 2.0A/0.6A

Motor: DC gear motor
Nominal Voltage: 24 VDC
RPM: 280 RPM at nominal voltage
Accessories: Three sizes of tube clips to secure tubing to pump head are included (P/N4000.601/602/603)
Weight: 1200g

DIMENSIONS (MM)



ORDERING INFORMATION

1) Select Pump
2) Select Tubing

Model	Description
4000.241	Peristaltic Pump, 6.0 or 8.0 mm Tube ID x 2.4 mm Wall
4500.322	Peristaltic Pump, 6.0 to 9.6 mm tube ID x 3.2 mm Wall
4000.001	Spare Rotor for 2.4 mm ID Tube Pump
4000.002	Spare Rotor for 3.2 mm ID Tube Pump

Model	Tubing Sets (Includes Barb Connectors)
4000.504	Lagoprene ID Ø 6.0 x 2.4 mm x single length
4000.505	Lagoprene ID Ø 8.0 x 2.4 mm x single length
4000.508	Lagoprene ID Ø 9.5 x 2.4 mm x single length
4000.507	Lagoprene ID Ø 8.0 x 3.2 mm x single length
4000.506	Lagoprene ID Ø 9.5 x 3.2 mm x single length
4000.527	ED-Plex ID Ø 6.4 x 2.4 mm x single length
4000.528	ED-Plex ID Ø 8.0 x 2.4 mm tube set x single length
4000.530	ED-Plex ID Ø 9.5 x 3.2 mm tube set x single length
4000.601	Tube clips (2), 6.0 to 8.0 mm ID x 2.4 mm Wall
4000.602	Tube clips (2) 9.5 mm ID x 2.4 mm Wall
4000.603	Tube clips (2) 9.5 mm ID x 3.2 mm Wall

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VERDER
R3DC Peristaltic Pump
Flow Rate To 3.4 L/min (54 GPH)

DESCRIPTION
Model R3DC is a rugged pump featuring a conventional rotor design. It incorporates a simple, easy tube loading system. Thick wall tubing is used for high suction and pressure capability.

The pump is commonly used in ink production, chemical dispensing, industrial detergent pumping and other suitable fluidic applications.

SPECIFICATIONS
Pump Head: Aluminium alloy with support bearing
Rotor:Aluminium alloy
Motor: 24V D.C. 100W Spur gearbox
Tube:Verderprene and Silicone

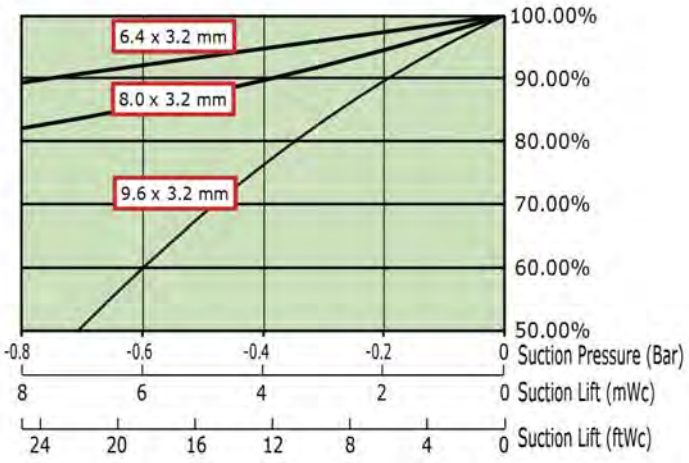
Tube Sizes (I.D x Wall Thickness): 6.4 x 3.2mm, 8.0 x 3.2mm and 9.6 x 3.2mm
Weight: 1.75 kg (3.9 lb)

Models & Flow Characteristics						
Model No. w/Verderprene Tubing	**Model No. w/Silicone Tubing**	**Tubing ID x Wall Thickness**	**Pump Speed (RPM)**	**Flow (L/M)**	**Flow (L/H)**	**Flow (GPH)**
AU M360240 05	AU M360240 06	6.4 x 3.2 mm (1/4" x 1/8")	240	1.8	106.6	28.2
AU M380240 15	AU M380240 16	8.0 x 3.2 (5/16" x 1/8")		2.8	168.5	44.5
AU M310240 12	AU M310240 13	9.6 x 3.2 mm 3/8" x 1/8"		3.4	204.5	54

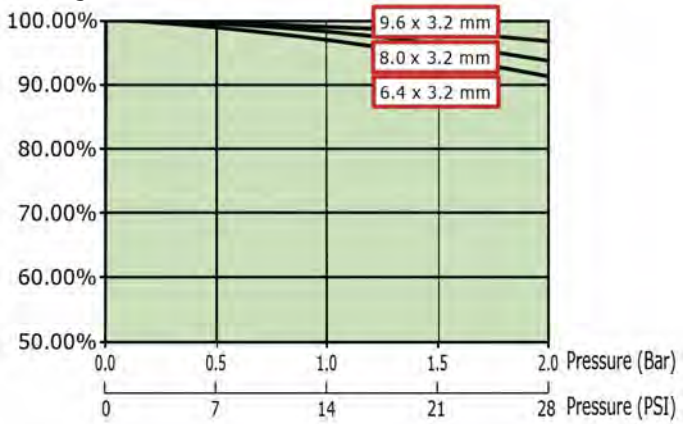
Spare Parts & Tube Sets	
Part Number	**Description**
AU E3212 ASSY	R3D HOUSING ASSY
AU E0197/B	R3D SHAFT ADAPTOR
AU E3215 ASSY	R3 FRONT COVER ASSY
AU E0690 04	R3DC STD 3R ROTOR ASSY
AU E3214 ASSY	R3 TUBE CLAMP ASSY
185.1035.P	PK 10 8/10 MM WHT ACETAL TUBE CONNECTORS
185.1034.P	PK 10 8/10MM BLACK PP TUBE CONNECTORS

Spare Parts & Tube Sets	
Part Number	**Description**
AU E3250 P	PACK OF 5 R3 6.4 x 3.2 VP TUBE ELEMENTS
AU E3251 P	PACK OF 5 R3 8.0 x 3.2 VP TUBE ELEMENTS
AU E3252 P	PACK OF 5 R3 9.6 x 3.2 VP TUBE ELEMENTS
AU E3253 P	PACK OF 5 R3 6.4 x 3.2 SI TUBE ELEMENTS
AU E3254 P	PACK OF 5 R3 8.0 x 3.2 SI TUBE ELEMENTS
AU E3255 P	PACK OF 5 R3 9.6 x 3.2 SI TUBE ELEMENTS

Suction



Discharge



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VERDER

R6 Peristaltic Pump

Flow Rate To 7.8 L/min (2.06 GPM)

DESCRIPTION

Model R6 is a rugged pump featuring a conventional rotor design. It incorporates a simple, easy tube loading system.

Thick wall tubing is used for high suction and pressure capability.

SPECIFICATIONS

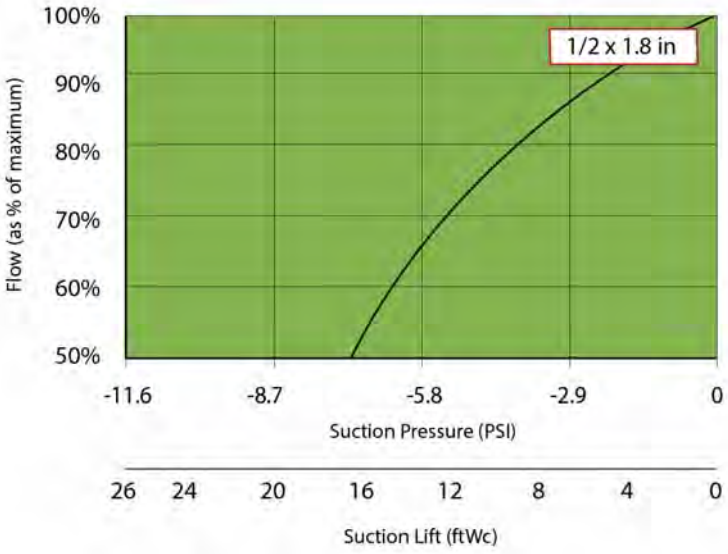
Rotor Assembly:Anodized Aluminum with Three Nylatron® Rollers
Motor: 230V, 3 Phase, 60Hz, IP 55
Power: ¼ HP 60Hz
Tube:Verderprene or Silicone

Tube Sizes (I.D x Wall Thickness): 1/2" x 1.8" (12.7 x 3.2 mm)
Weight: 14.3 lb

Model Selection							
Model No. w/Verderprene Tubing	Model No. w/Silicone Tubing	Tubing ID	Pump Speed (RPM)	Flow (GPH)	Flow (GPM)	Flow (ML/Min)	Flow (L/H)
AU M613068 03	AU M613068 04	1/2"	84	43.9	0.73	2,773	166.4
AU M6130137 07	AU M6130137 08	1/2"	169	87.9	1.47	5,548	332.9
AU M6130196 07	AU M6130196 08	1/2"	242	123.7	2.06	7,810	468.6

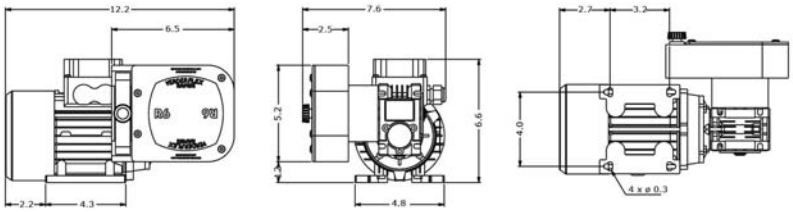
Spare Parts & Tube Sets	
Part Number	Description
AU E3221 ASSY	R6 HOUSING ASSY (NMRV030)
AU E1740	ADAPTOR SLEEVE (NMRV030)
AU E3223 ASSY	R6 FRONT COVER ASSY
AU E0495 05	R6 STD 3R ROTOR ASSY
AU E3222 ASSY	R6 TUBE CLAMP ASSY
AU E3256 P	PACK OF 5 R6 12.7 x 3.2 VP TUBE ELEMENTS
AU E3257 P	PACK OF 5 R6 12.7 x 3.2 SI TUBE ELEMENTS

Suction



Discharge

DIMENSIONS (MM, INCHES)



VERDER
R8 Peristaltic Pump
Flow Rate To 9.66 L/min (2.55 GPM)

DESCRIPTION
Model R8 is an extremely strong pump featuring a conventional rotor design. The pump is well suited for viscous fluid media applications. Optionally, a dual head unit is available (doubling the flow output).

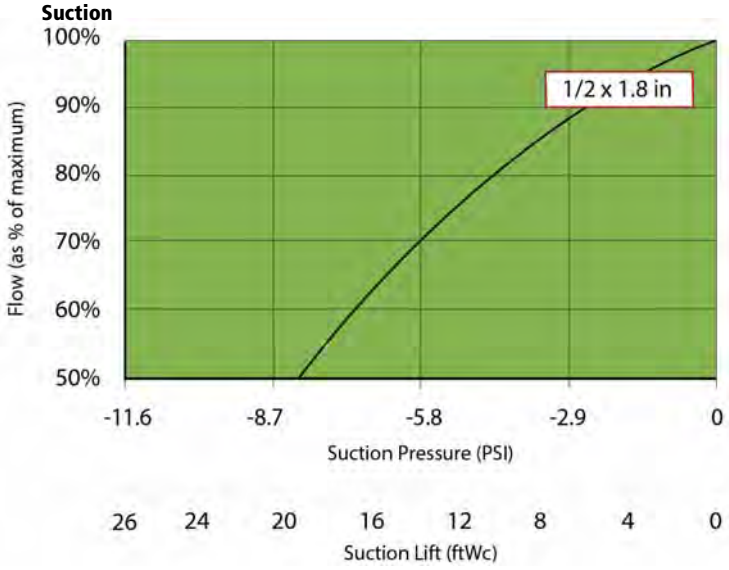
The unit is rated for continuous or intermittent duty.

SPECIFICATIONS
Rotor Assembly:Anodized Aluminum with Three Nylatron® Rollers
Motor: 230V, 3 Phase, 60Hz, IP 55
Power: ¼ HP 60Hz
Tube:Verderprene or Silicone
Tube Sizes (I.D x Wall Thickness): 1/2" x 1.8" (12.7 x 3.2 mm)
Weight: 14.3 lb

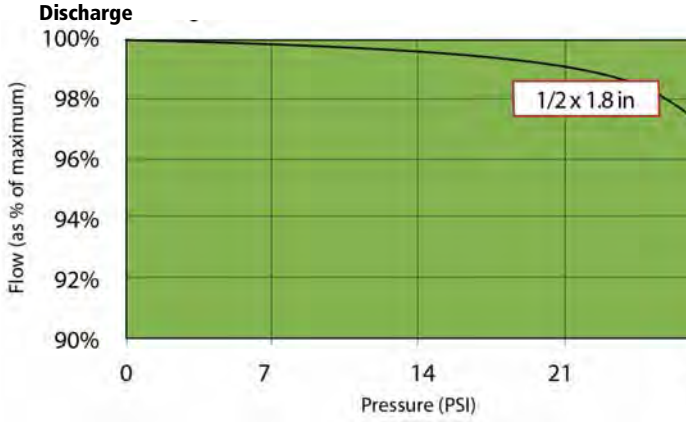
Model Selection							
Model No. w/Verderprene Tubing	Model No. w/Silicone Tubing	Tubing ID	Gear Box Ratio	Pump Speed (RPM)	Flow (GPH)	Flow (GPM)	Flow (L/Min)
AU M813068 08	AU M813068 09	1/2"	20:1	84	55.3	0.922	3.49
AU M813137 05	AU M813137 06	1/2"	10:1	167	89.5	1.79	6.78
AU M813196 13	AU M813196 14	1/2"	7.5:1	242	153	2.55	9.66

Spare Parts & Tube Sets	
Part Number	Description
AU E3231 ASSY	R8 HOUSING ASSY (NMRV030)
AU E1740	ADAPTOR SLEEVE (NMRV030)
AU E3234 ASSY	R8 FRONT COVER ASSY
AU E0519 06	R8 STD 3R ROTOR ASSY
AU E3233 ASSY	R8 TUBE CLAMP ASSY
AU E3258 P	PACK OF 5 R8 12.7 x 3.2 VERDERPRENE TUBE ELEMENTS
AU E3259 P	PACK OF 5 R8 12.7 x 3.2 SILICONE TUBE ELEMENTS
185.1037.P	PK 10 12.7/13MM WHT ACETAL TUBE CONNECTR
185.1036.P	PK 10 12.7/13MM BLACK PP TUBE CONNECTORS

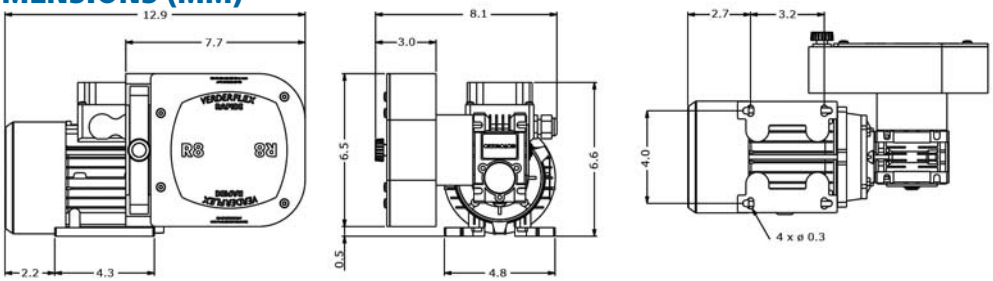
Suction



Discharge



DIMENSIONS (MM)



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VERDER

R12 Peristaltic Pump

Flow Rate To 17.2 L/min (4.55 GPM)

DESCRIPTION

Model R12 is an extremely strong pump featuring a conventional 3 roller design. The pump has excellent suction/lift performance and is well suited for viscous fluid media applications.

The unit is rated for continuous or intermittent duty.

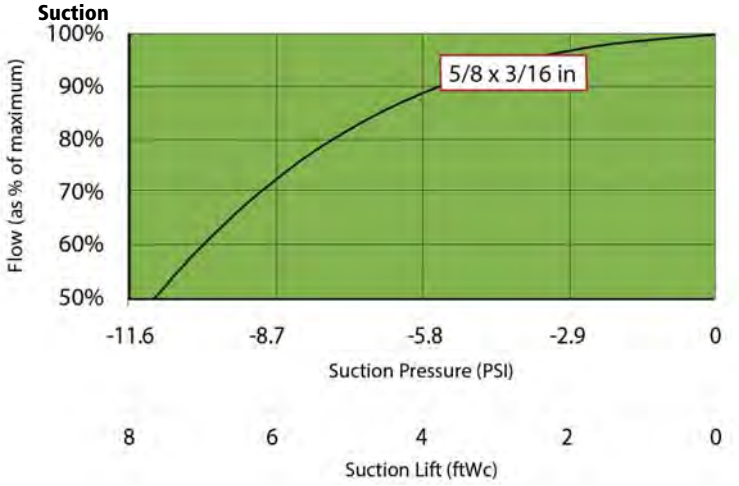
SPECIFICATIONS

Rotor Assembly:Anodized Aluminum with Three Nylatron® Rollers
Motor: 230V, 3 Phase, 60Hz, IP 55
Power: ¼ HP 60Hz
Tube:Verderprene or Silicone
Tube Sizes (I.D x Wall Thickness): 5/8" x 3/16" (15.9 x 4.8 mm)
Weight: 26.5 lb

Model Selection							
Model No. w/Verderprene Tubing	Model No. w/Silicone Tubing	Tubing ID	Gear Box Ratio	Pump Speed (RPM)	Flow (GPH)	Flow (GPM)	Flow (L/Min)
AU K1216093 17	AU K1216093 18	5/8"	15:1	115	182	3.03	11.47
AU K1216140 11	AU K1216140 12	5/8"	10:1	173	273	4.55	17.26

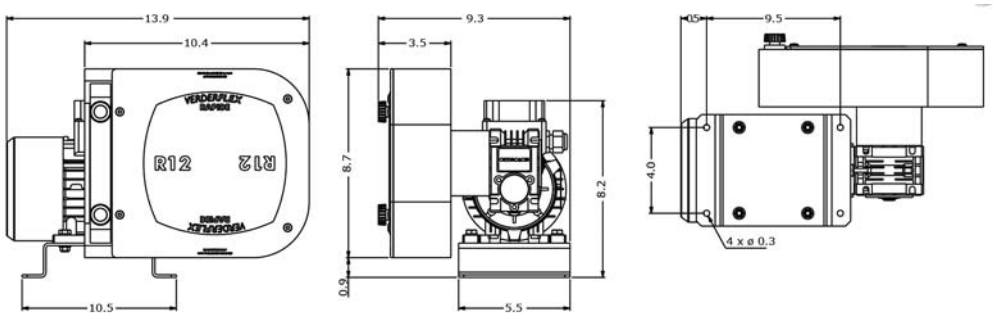
Spare Parts & Tube Sets	
Part Number	Description
AU E3241 ASSY	R12 HOUSING ASSY (NMRV030)
AU E1781	R12 ADAPTOR SLEEVE (NMRV030)
AU E3244 ASSY	R12 FRONT COVER ASSY
AU E1780 ASSY 01	R12 STD 3R ROTOR ASSY
AU E3243 ASSY	R12 TUBE CLAMP ASSY
AU E1889 P	PACK OF 2 R12 15.9x 4.8 VP TUBE ELEMENTS
AU E3260 P	PACK OF 2 R12 15.9x 4.8 SI TUBE ELEMENTS

Suction



Discharge

DIMENSIONS (MM, INCHES)



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BOXER

9700 Bench Top Peristaltic Pump Dispensor

Variable Speed, Reversable, Liquid Flow to 180 ml/min

DESCRIPTION

Boxer 9700 pump dispenser has been developed for bench top and oem applications where variable flow control is required. Use the 9700 dispenser to transfer fluid directly from your reservoir to your application at the rate you require.

Boxer 9700 minimizes waste, it will prime back to your reservoir & aspirate back any unused reagents. No time is wasted in purging and cleaning equipment, the inexpensive "Clip-On" tube holder allows you to use one tube for each reagent.

Momentary action and latching switch will start and stop the dispense operation abruptly. The pump works with three tube sizes to optimize the dispense flow rate.

Boxer 9700 is equipped with a remote switch socket. An optional foot switch enables work hands free.

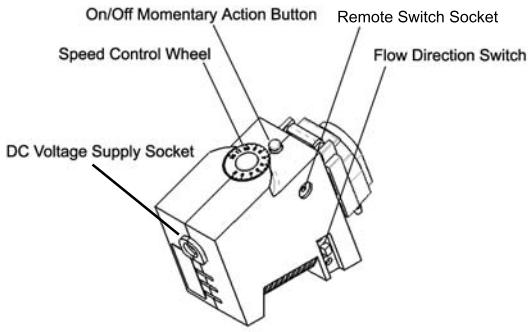
For added safety and peace of mind, the DC unit is powered by a low voltage power supply.

The units are supplied standard with Ø3.0 mm ID Lagoprene tube.

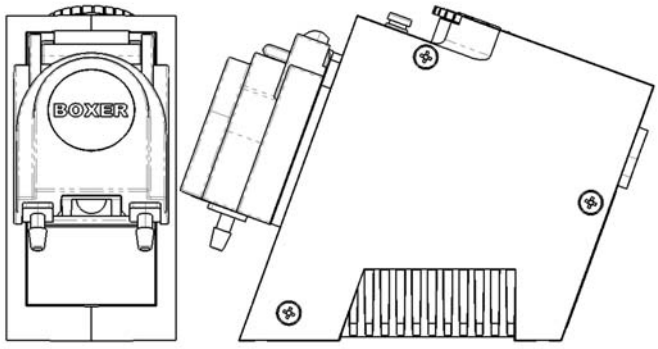
SPECIFICATIONS

Flow Data:
- 1.0 mm ID Tube: to 25 ml/min
- 2.0 mm ID Tube: to 85 ml/min
- 3.0 mm ID Tube: to 180 ml/min

Wetted Material: Silicone, Lagoprene, PHI, ED-Plex
Motor: DC gear motor, 520rpm
Life expectancy: >2000 hours
Power: AC adaptor supplied, 100-240 VAC 50/60 Hz in, 12 VDC out
Flow Direction: Manual switch to reverse flow
Max Pressure: 1 bar (14.5 PSI
Max. Vacuum: -950mbar (28.1 inches Hg)
Operating Temperature Range: 10 to 40°C
Storage Temperature Range: 4 to 40°C



Model	Description
9700.000	9700 Pump, DC Motor, AC adaptor, 3 mm ID Lagoprene tbe
6013.000	Optional Foot Switch
9000.504	Silicone ID Ø 1.0 mm with PP connectors
9000.505	Silicone ID Ø 2.0 mm with PP connectors
9000.510	Silicone ID Ø 3.0 mm with PP connectors
9000.512	Lagoprene ID Ø 1.0 mm with PP connectors
9000.513	Lagoprene ID Ø 2.0 mm with PP connectors
9000.558	Lagoprene ID Ø 3.0 mm with PP connectors
9000.531	PHI ID Ø 1.0 mm with PP connectors
9000.532	PHI ID Ø 2.0 mm with PP connectors
9000.565	PHI ID Ø 3.0 mm with PP connectors
9000.525	ED-Plex ID Ø 1.0 mm with PP connectors
9000.526	ED-Plex ID Ø 2.0 mm with PP connectors
9000.520	ED-Plex ID Ø 3.0 mm with PP connectors



BOXER

9110 Bench Top Peristaltic Pump Dispensor

Variable Speed, Reversable, Liquid Flow to 180 ml/min

DESCRIPTION

The 9110 is a "plug and play" table top dispenser system for laboratory and dosing applications. It is supplied complete with pump unit, 1m of tubing, dispenser tip and holder, set of tube clips, universal power supply and instruction manual.

Fitted with a quality 24 V DC motor geared to either 320 or 520 rpm the 9110 is a fully programmable, compact, and ecconomic dispenser.

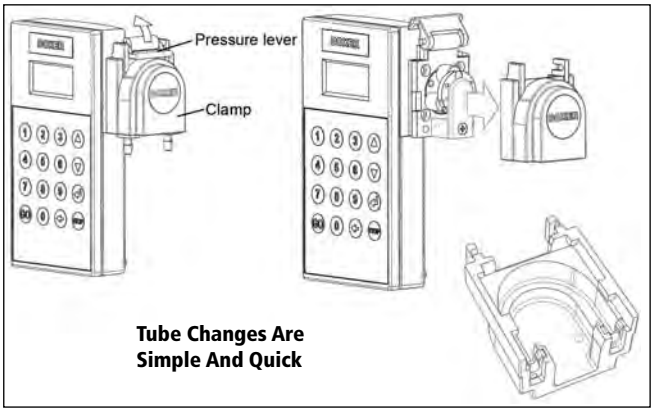
The units are supplied standard with a Ø2.0 mm ID Silicone tube.

- Continuous dispense mode
- Input for remote foot pedal (or system signal)
- Flow direction switch
- 24 V DC for safe operation
- Easy and quick tube replacement
- Compact construction
- Self priming
- Range of alternative tube materials and sizes available

SPECIFICATIONS

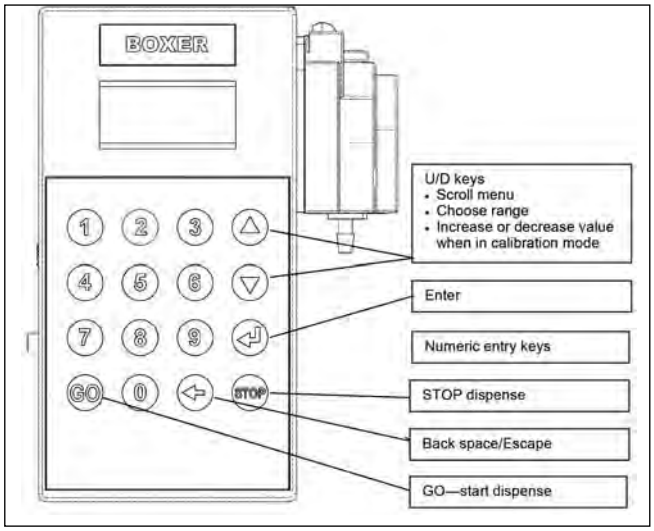
Flow Data:
- Model 9110.000, 320 RPM
- 1.0 mm ID Tube: to 15 ml/min
- 2.0 mm ID Tube: to 50 ml/min
- 3.0 mm ID Tube: to 110 ml/min
- Model 9110.010, 520 RPM
- 1.0 mm ID Tube: to 25 ml/min
- 2.0 mm ID Tube: to 85 ml/min
- 3.0 mm ID Tube: to 180 ml/min

Wetted Material: Silicone, Lagoprene, PHI, ED-Plex
Motor: DC gear motor, 520rpm
Life expectancy: >2000 hours
Power: AC adaptor supplied, 100-240 VAC 50/60 Hz in, 24 VDC out
Flow Direction: Manual switch to reverse flow
Max Pressure: 1 bar (14.5 PSI
Max. Vacuum: -950mbar (28.1 inches Hg)
Operating Temperature Range: 10 to 40°C
Storage Temperature Range: 4 to 40°C
Operating Relative Humidity: 90%



Tube Changes Are Simple And Quick

Model	Description
9110.000	9110 Pump, 320 RPM, DC Motor, AC adaptor, 2 mm ID Silicone tube
9110.010	9110 Pump, 520 RPM, DC Motor, AC adaptor, 2 mm ID Silicone tube
6013.000	Optional Foot Switch
9100.001	Mounting bracket/stand
9100.005	Dispenser tips. 1-100µl (25 pcs)
9000.504	Silicone ID Ø 1.0 mm with PP connectors
9000.505	Silicone ID Ø 2.0 mm with PP connectors
9000.510	Silicone ID Ø 3.0 mm with PP connectors
9000.512	Lagoprene ID Ø 1.0 mm with PP connectors
9000.513	Lagoprene ID Ø 2.0 mm with PP connectors
9000.558	Lagoprene ID Ø 3.0 mm with PP connectors
9000.531	PHI ID Ø 1.0 mm with PP connectors
9000.532	PHI ID Ø 2.0 mm with PP connectors
9000.565	PHI ID Ø 3.0 mm with PP connectors
9000.525	ED-Plex ID Ø 1.0 mm with PP connectors
9000.526	ED-Plex ID Ø 2.0 mm with PP connectors
9000.520	ED-Plex ID Ø 3.0 mm with PP connectors



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BOXER

9200 Bench Top Peristaltic Pump Dispensor

Variable Speed, Reversable, Liquid Flow to 350 ml/min

DESCRIPTION

The 9200 is a "plug and play" table top dispenser system for laboratory and dosing applications. It is supplied complete with pump unit, 1m of tubing, dispenser tip and holder, set of tube clips, universal power supply and instruction manual.

Fitted with a quality 24 V DC motor geared to 312 rpm the 9200 is a fully programmable, compact, and ecconomic dispenser.

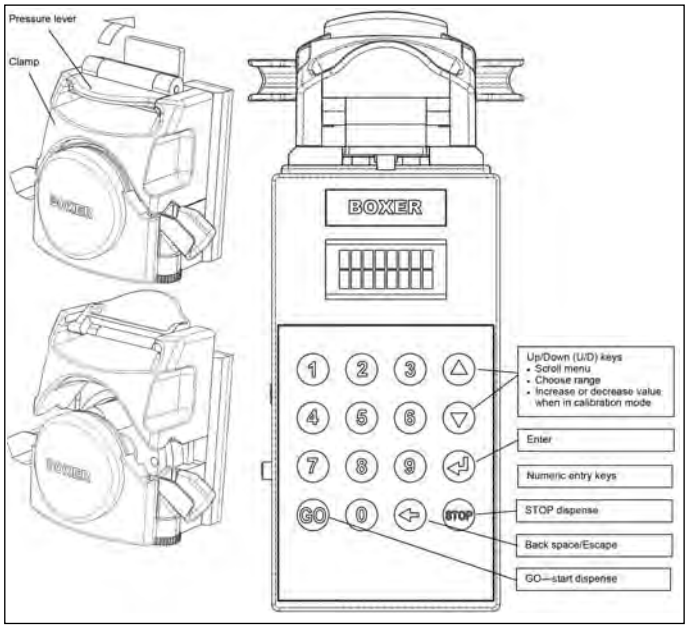
The units are supplied standard with a Ø4.8 mm ID PHI tube.

- Continuous dispense mode
- Input for remote foot pedal (or system signal)
- Flow direction switch
- 24 V DC for safe operation
- Easy and quick tube replacement
- Compact construction
- Self priming
- Range of alternative tube materials and sizes available

SPECIFICATIONS

Flow Data:
- 1.6 mm ID Tube: to 50 ml/min
- 2.4 mm ID Tube: to 100 ml/min
- 3.2 mm ID Tube: to 175 ml/min
- 4.8 mm ID Tube: to 360 ml/min

Wetted Material: Silicone, Norprene G, PHI, ED-Plex
Motor: DC gear motor, 520rpm
Life expectancy: >2000 hours
Power: AC adaptor supplied, 100-240 VAC 50/60 Hz in, 24 VDC out
Flow Direction: Manual switch to reverse flow
Max Pressure: 1 bar (14.5 PSI
Max. Vacuum: -950mbar (28.1 inches Hg)
Operating Temperature Range: 10 to 40°C
Storage Temperature Range: 4 to 40°C
Operating Relative Humidity: 90%
Storage Relative Humidity: 95%



Model	Description
9200.000	9200 Pump, 312 RPM, DC Motor, AC adaptor, 4.8 mm ID PHI tube
6013.000	Optional Foot Switch
9100.001	Mounting bracket/stand
15000.206	Silicone ID Ø 1.6 mm x single length
15000.207	Silicone ID Ø 2.4 mm x single length
15000.208	Silicone ID Ø 3.2 mm x single length
15000.012	Norprene G ID Ø 1.6 mm x single length
15000.013	Norprene G ID Ø 3.2 mm x single length
15000.014	Norprene G ID Ø 4.8 mm x single length
15000.019	PHI ID Ø 1.6 mm x single length
15000.020	PHI ID Ø 2.4 mm x single length
15000.021	PHI ID Ø 3.2 mm x single length
15000.048	PHI ID Ø 4.8 mm x single length
15000.054	ED-Plex ID Ø 1.6 mm x single length
15000.056	ED-Plex ID Ø 3.2 mm x single length
15000.057	ED-Plex ID Ø 4.8 mm x single length

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VERDER
EV045 & EV500 Bench Top Peristaltic Pumps

Flow to 185 ml/min

DESCRIPTION

EV045& EV500 are compact, economical, cased pumps that provide variable speed/flow rate and have a fast prime switch. The models accept three different tube sizes.

EV045

EV500

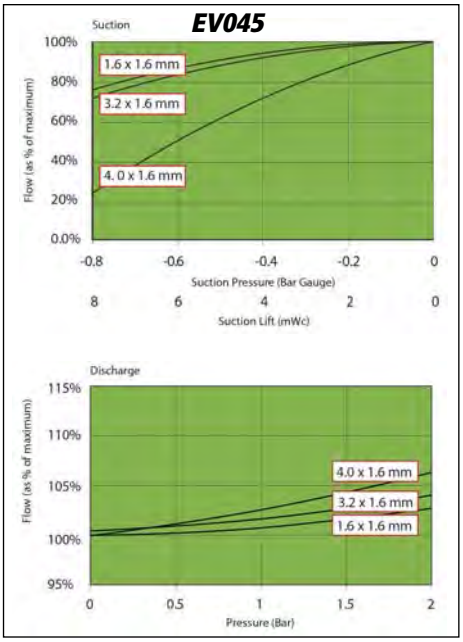
PUMP SPECIFICATIONS

Pumphead: EV045, Black Cycology; EV500, Polycarbonate
Speeds: EV045, 5-60 RPM; EV500, 5-82 RPM
Rotor: Polycarbonate with 2 Nylatron® rollers
Motor: Permanent Magnet
Supply: 110/230v 50/60Hz 150w
Controls: Direction of flow switch
"Fast prime" push button
Rotary speed control potentiometer
Tube: Verderprene (other tube material available)
Weight: 1.7 kgs(3.75 lbs)
Dimensions: See Dimension Drawing
Enclosure: IP30, Epoxy Polyester Coating

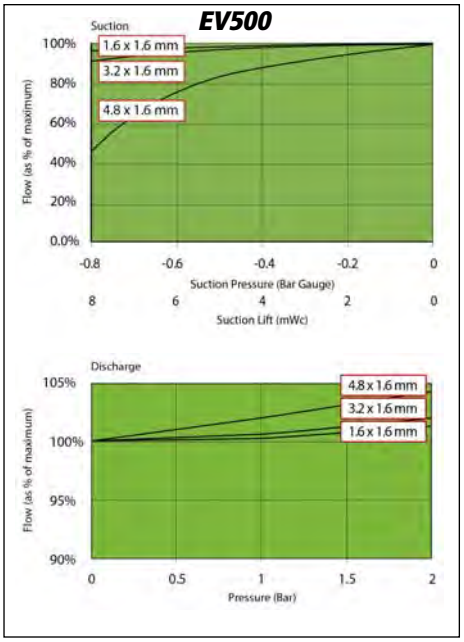
Model Series	Ordering Part Number	Tubing ID x Wall Thickness (MM)	Min. Flow (ml/min)	Max. Flow (ml/min)
EV045	160.4002	1.6 x 1.6	0.7	12
	160.4102	3.2 x 1.6	3.0	36
	160.4202	4.0 x 1.6	5.0	60
EV500	160.5002	1.6 x 1.6	2	23
	160.5102	3.2 x 1.6	5	82
	160.5202	4.8 x 1.6	11	185

Spare Tube Sets	
Part Number	**Description**
AU E0583	EV045 1.6 x 1.6 VERDERPRENE TUBE ASSY 4.2 mm Hose Barb
AU E0564	EV045 3.2 x 1.6 VERDERPRENE TUBE ASSY 4.2 mm Hose Barb
AU E0761	EV045 4.0 x 1.6 VERDERPRENE TUBE ASSY 4.2 mm Hose Barb
AU E0275 02	EV500 1.6mm VERDERPRENE TUBE ASSY 4.2 mm Hose Barb
AU E0275 03	EV500 1.6mm VERDERPRENE TUBE ASSY 7 mm Hose Barb
AU E0275 06	EV500 3.2mm VERDERPRENE TUBE ASSY 4.2 mm Hose Barb
AU E0275	EV500 4.8mm VERDERPRENE TUBE ASSY 7 mm Hose Barb

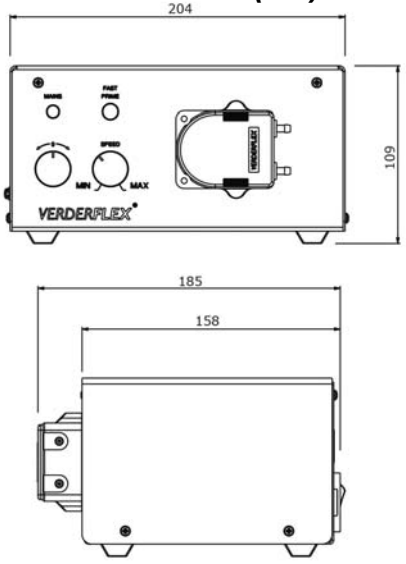
EV045



EV500



DIMENSIONS (MM)



VERDER
EV1500 & EV3000 Bench Top Peristaltic Pumps

Flow to 3.85 liters/

DESCRIPTION

EV1500 & EV3000 are compact, economical, cased pumps that provide variable speed/flow rate and have a fast prime switch. The models accept two and three different tube sizes respectively.

EV1500

EV3000

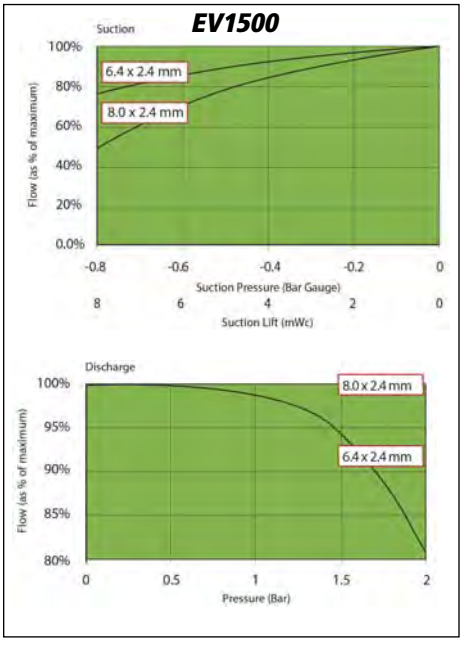
PUMP SPECIFICATIONS

Pumphead: EV1500, Black Cycology; EV3000, Aluminum alloy with support bearing
Speeds: EV1500, 30-2400 RPM; EV3000, 30-250 RPM
Rotor: EV1500, Nylon 6 with 2 acetal polymer rollers; EV3000, Aluminum alloy, anodized finish, 2 rollers
Motor: Permanent Magnet
Supply: 110/230v 50/60Hz 150w
Controls: Direction of flow switch
"Fast prime" push button
Rotary speed control potentiometer
Tube: Verderprene, Silicone
Weight:3 kgs(6.61 lbs)
Dimensions: See Dimension Drawing
Enclosure: IP30, Epoxy Polyester Coating

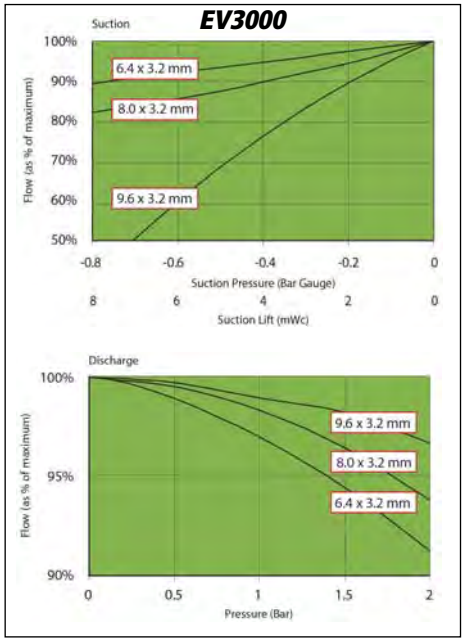
Model Series	Ordering Part Number	Tubing ID x Wall Thickness (MM)	Min. Flow (ml/min)	Max. Flow (ml/min)
EV1500	160.1002 (Order Tubing Separately)	6.4 x 2.4	190	1,710
		8.0 x 2.4	280	2,570
EV3000	160.3002 (Order Tubing Separately)	6.4 x 3.2	210	1,925
		8.0 x 3.2	330	3,025
		9.6 x 3.2	420	3,850

Tubing	
Part Number	**Description**
150.0623.1	1 MTR LENGTH VERDERPRENE 6.4 ID x 2.4 WT
150.0623.15	15m ROLL VERDERPRENE 6.4 ID x 2.4 WT
150.0626.1	1 MTR LENGTH VERDERPRENE 8.0 ID x 2.4 WT
150.0626.15	15m ROLL VERDERPRENE 8.0 ID x 2.4 WT
460.1032.1	1 MTR LENGTH SILICONE TUBE 6.4 IDx2.4 WT
460.1032.15	15m ROLL SILICONE TUBING 6.4 ID x 2.4 WT
460.0705.1	1 MTR LENGTH SILICONE TUBE 8.0 IDx2.4 WT
460.0705.15	15m ROLL SILICONE TUBING 8.0 ID x 2.4 WT
185.1035.P	PK 10 8/10 MM WHT ACETAL TUBE CONNECTORS
185.1034.P	PK 10 8/10MM BLACK PP TUBE CONNECTORS
AU E3250 P	PACK OF 5 R3 6.4 x 3.2 VERDERPRENE TUBE ELEMENTS
AU E3251 P	PACK OF 5 R3 8.0 x 3.2 VERDERPRENE TUBE ELEMENTS
AU E3252 P	PACK OF 5 R3 9.6 x 3.2 VPVERDERPRENE TUBE ELEMENTS

EV1500



EV3000



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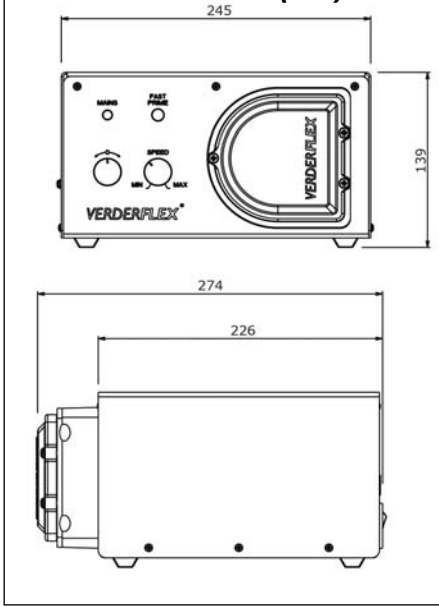

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VERDER
EV8000 Bench Top Peristaltic Pump
Flow to 8 liters/min

DESCRIPTION
EV8000 is a compact, economical, cased pump that provides manual variable speed/flow rate control via a potentiometer. Flow can be reversed.

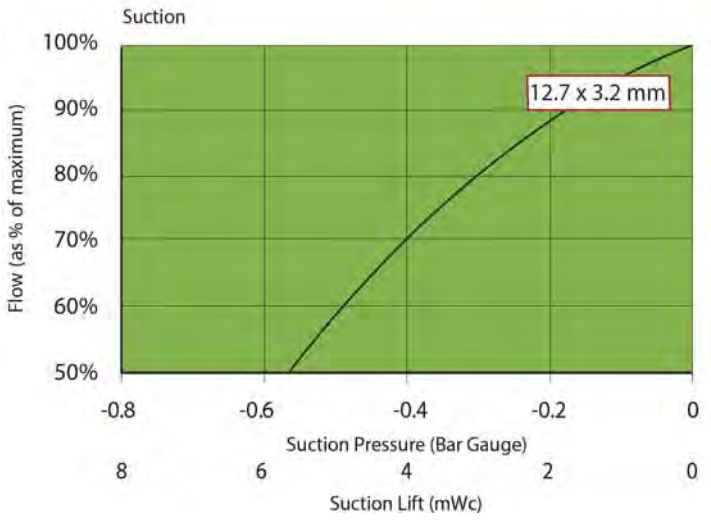
The models uses a 12.7 I.D. x 3.2 mm wall Verderprene tubing.

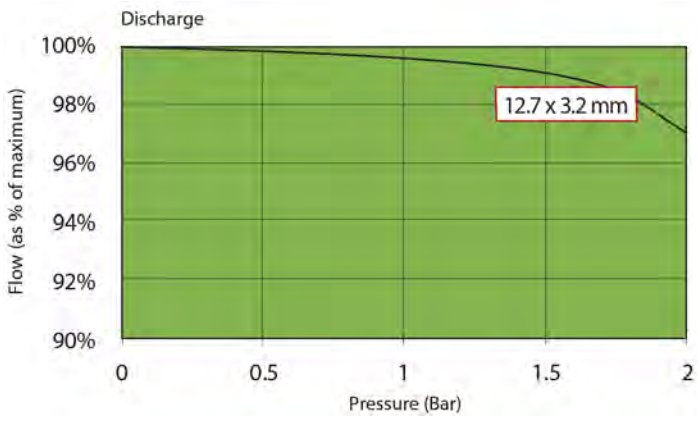
PUMP SPECIFICATIONS
Pumphead: Aluminum alloy, polyester coated with acrylic protective cover
Speed: 0-180 RPM
Rotor Assembly: Aluminum alloy, anodized finish, 3 rollers
Supply: 110/230v 50/60Hz 150w
Controls: Direction of flow switch
Rotary speed control potentiometer

Tube: Verderprene
Weight:8 kgs(17.6 lbs)
Dimensions: See Dimension Drawing
Enclosure: IP30, Epoxy Polyester Coating

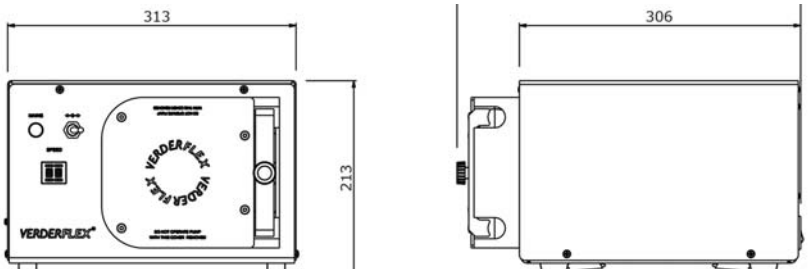
Model Series	Ordering Part Number	Tubing ID x Wall Thickness (MM)	Min. Flow (ml/min)	Max. Flow (ml/min)
EV8000	160.8002 (Order Tubing Separately)	12.7 x 3.2	0	8,000

Tubing	
Part Number	**Description**
AU E3258 P	PACK OF 5 R8 12.7 x 3.2 VP TUBE ELEMENTS





DIMENSIONS (MM)



CLARK

TM 30-200 Series Magnet Drive Rotary Vane Pump

Flow to 550 LPH, Pressure to 200 PSI

DESCRIPTION

The principle of the magnet drive is the driving force of the pole-to-pole alignment of 2 magnets. The driven magnet is attached to the pump shaft within the pump, while the driving magnet is attached to the motor shaft and closely located to the driven magnet. By means of magnetic attraction, the pump rotates in response to motor shaft rotation.

This series of pumps is available in four different displacements.The housing is either brass or AISI 303 stainless steel with carbon graphite internal components. The pumps can be equipped with an optional built-in relief valve.Inlet and outlet ports have 3/8" NPT female threads. All models are available with NBR,Viton or EPDM seals.Compared to conventional coupling, the magnet drive has several advantages :

1) Immediate decoupling upon overload
2) Higher efficiency
3) Longer service life
4) No leaks or contamination
5) Noiseless operation

TYPICAL APPLICATIONS

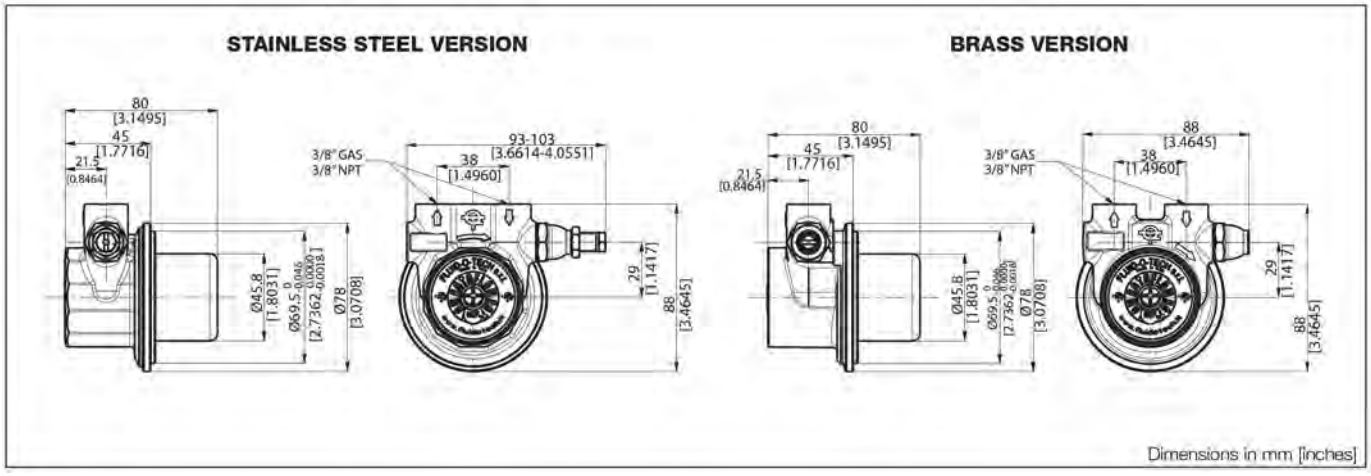
- Solar heating systems
- Booster Systems
- Cooling systems
- Water Treatment

SPECIFICATIONS

Pump Housing: Bras or AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)

Seals: NBR (Viton, EPDM upon request)
Max Size Solid Particles : 10 microns
Max Motor Speed : 3600 rpm
Max System Pressure : 18 Bar (260 psi)
Pump Weight: 1.1 kg(2.4 lb)

DIMENSIONS (MM)



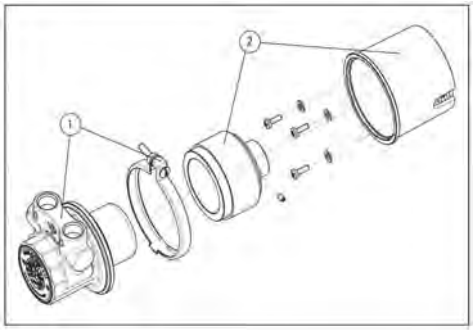


Table 1

Motor Adapter		
Position	**Description**	**Part Number**
1	TM Series Pump	Table 2
2	NEMA 56C Adaptor Assembly- includes P/N 201607 NEMA 56 Adapter & P/N TMAF5BS Driving Magnet 5/8"	TMB3

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ABOUT RELIEF VALVES

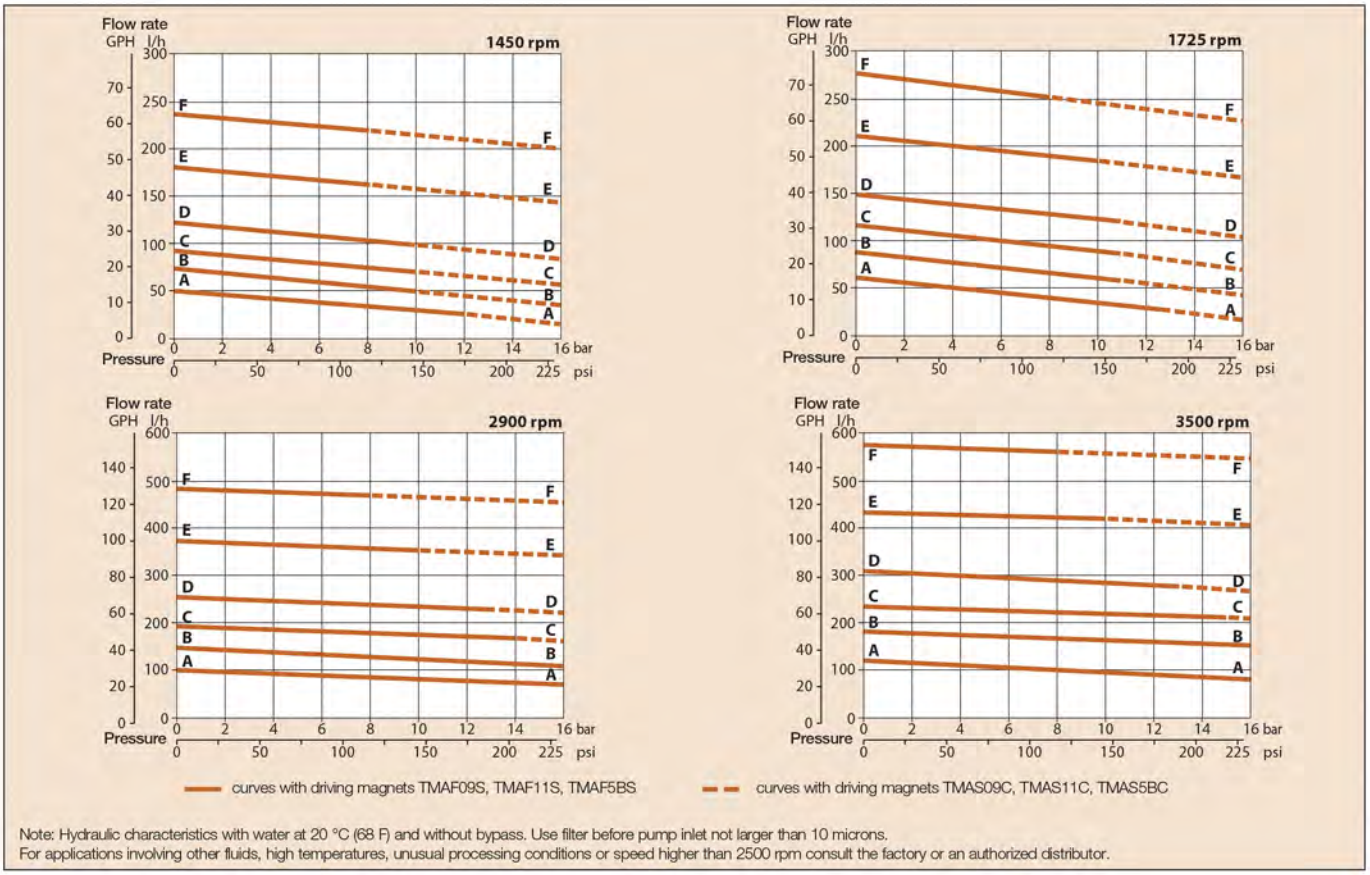
Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for TM 30-200 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

MODEL SELECTION/FLOW CURVES



Note: Hydraulic characteristics with water at 20 °C (68 F) and without bypass. Use filter before pump inlet not larger than 10 microns.
For applications involving other fluids, high temperatures, unusual processing conditions or speed higher than 2500 rpm consult the factory or an authorized distributor.

Table 2

Model	Relief Valve	Housing	Figure
TMSS030	No	Stainless Steel	A-A
TMSS050			B-B
TMSS070			C-C
TMSS100			D-D
TMSS150			E-E
TMSS200			F-F
TMSS031	Standard	Stainless Steel	A-A
TMSS051			B-B
TMSS071			C-C
TMSS101			D-D
TMSS151			E-E
TMSS201			F-F
TM0T030	No	Brass	A-A
TM0T050			B-B
TM0T070			C-C
TM0T100	No	Brass	D-D
TM0T150			E-E
TM0T200			F-F
TM0T031	Standard	Brass	A-A
TM0T051			B-B
TM0T071			C-C
TM0T101			D-D
TM0T151			E-E
TM0T201			F-F
TM0T034	Balanced	Brass	A-A
TM0T054			B-B
TM0T074			C-C
TM0T104			D-D
TM0T154			E-E
TM0T204			F-F

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CLARK

TMCF SeriesMagnet Drive Rotary Vane Pump With Motor

Flow to 550 LPH, Pressure to 200 PSI

DESCRIPTION

The principle of the magnet drive is the driving force of the pole-to-pole alignment of 2 magnets. The driven magnet is attached to the pump shaft within the pump, while the driving magnet is attached to the motor shaft and closely located to the driven magnet. By means of magnetic attraction, the pump rotates in response to motor shaft rotation.

This series of pumps, available in four different displacements, with either a brass or a stainless steel housing, AISI 303 stainless steel rotor, carbon graphite pumping chamber and vanes, can be equipped with an optional built-in relief valve.Inlet and outlet ports have 3/8" NPT femalethreads. All models are available with NBR,Viton or EPDM seals.Compared to conventional coupling, the magnetdrive have several advantages :

1) Immediate decoupling upon overload
2) Higher efficiency
3) Longer service life
4) No leaks or contamination
5) Noiseless operation

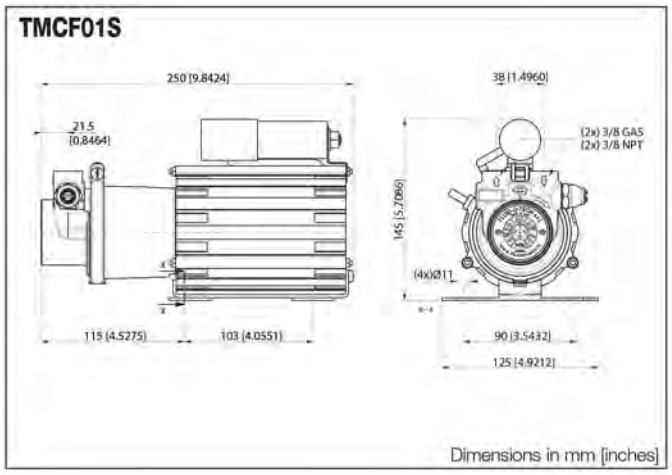
TYPICAL APPLICATIONS

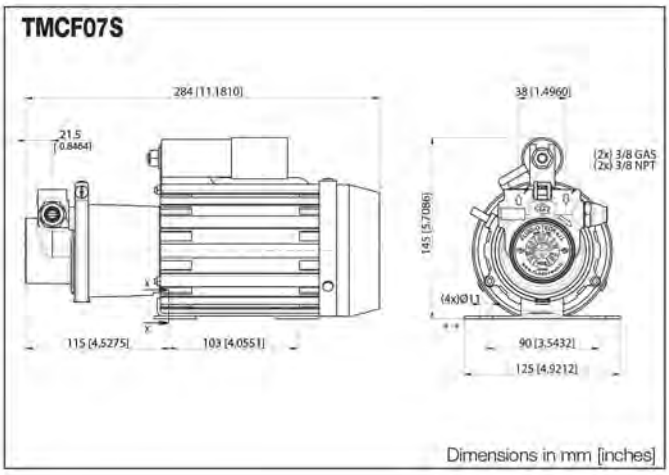
- Solar heating systems
- Refrigerating gas transfer
- Cooling systems
- Carpet cleaners

SPECIFICATIONS

Pump Housing: Brass or AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton, EPDM upon request)
Max Size Solid Particles : 10 microns
Max Motor Speed : 3600 rpm
Max System Pressure : 18 Bar (260 psi)
Pump Weight: 1.1 kg(2.4 lb)

DIMENSIONS (MM)





Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for TM 30-200 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

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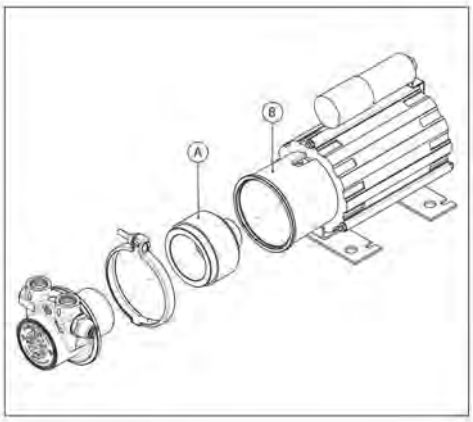
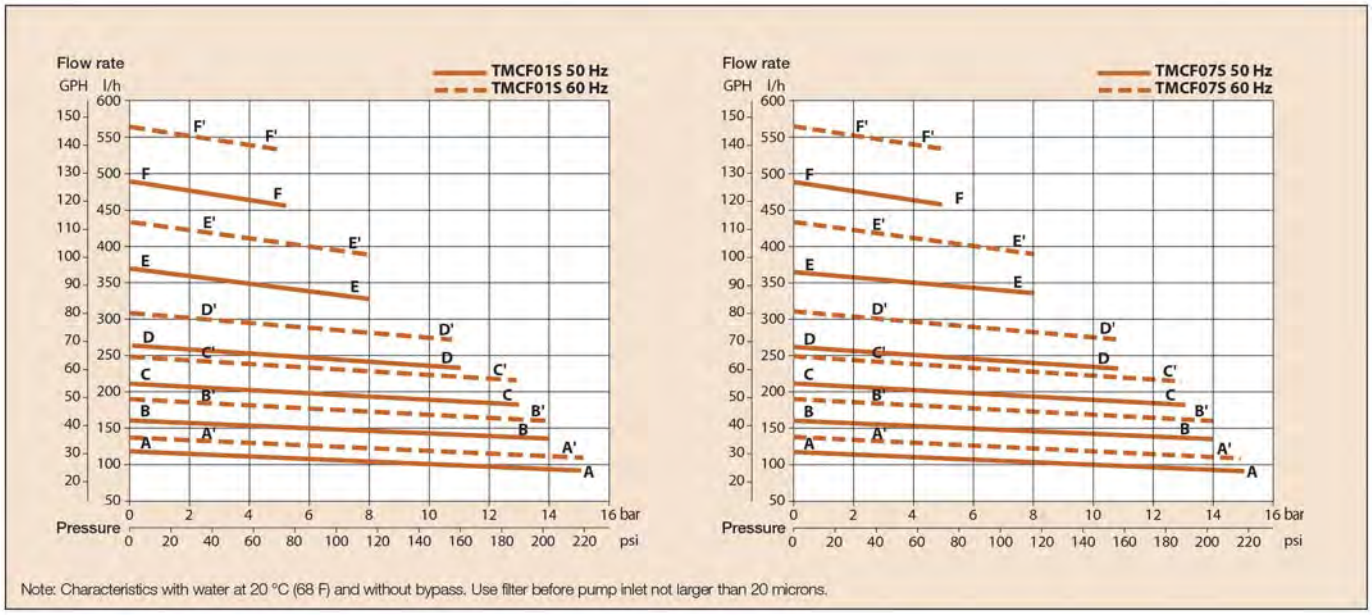
PUMP DRIVE ASSEMBLY

Table 1

Drive Assembly- A(Driving Magnet)+B(Motor w/PPS Adapter)		
Model	**TMCF01S**	**TMCF07S**
Voltage (V)	230 AC	230 AC
Frequency (Hz)	50/60	50/60
Poles	2	2
Rated Speed (rpm)	2850/3400	2870/3450
Current Consumption (A)	0.75	0.8
Output Power (W)	90	90
Motor Weight (kg)	5.6	5.7
Duty	Intermittent	Continuous



PUMP MODEL SELECTION/FLOW CURVES



Note: Characteristics with water at 20 °C (68 F) and without bypass. Use filter before pump inlet not larger than 20 microns.

Table 2

Model	Relief Valve	Housing	Figure
TMSS030	No	Stainless Steel	A-A
TMSS050			B-B
TMSS070			C-C
TMSS100			D-D
TMSS150			E-E
TMSS200			F-F
TMSS031	Standard	Stainless Steel	A-A
TMSS051			B-B
TMSS071			C-C
TMSS101			D-D
TMSS151			E-E
TMSS201			F-F
TM0T030	No	Brass	A-A
TM0T050			B-B
TM0T070			C-C

Model	Relief Valve	Housing	Figure
TM0T100	No	Brass	D-D
TM0T150			E-E
TM0T200			F-F
TM0T031	Standard	Brass	A-A
TM0T051			B-B
TM0T071			C-C
TM0T101			D-D
TM0T151			E-E
TM0T201			F-F
TM0T034	Balanced	Brass	A-A
TM0T054			B-B
TM0T074			C-C
TM0T104			D-D
TM0T154			E-E
TM0T204			F-F

ORDERING INFORMATION

A-B-C

A- Select Drive Assembly (Table 1)
B- Select Pump
C- If applicable specify cracking pressure for relief valve (PSI)
Example: TMCF07S-TMSS071-160PSI

CLARK

TM 300-400 Series Magnet Drive Rotary Vane Pump

Flow to 550 LPH, Pressure to 200 PSI

DESCRIPTION

The principle of the TM pump magnet drive is the driving force of the pole-to-pole alignment of 2 magnets. The driven magnet is attached to the pump shaft within the pump, while the driving magnet is attached to the motor shaft and closely located to the driven magnet. By means of magnetic attraction, the pump rotates in response to motor shaft rotation.

The TM 300-400 housing is AISI 303 stainless steel with carbon graphite internal components. The pumps can be equipped with an optional built-in relief/bypass valve. Inlet and outlet ports have 1/2" NPT female threads. All models are available with NBR,Viton or EPDM static seals.Compared to conventional coupling, the magnet drive has several advantages :

1) No Mechanical Seals
2) Totally Sealed Body
3) Longer service life
4) Low Power Consumption
5) Noiseless operation

TYPICAL APPLICATIONS

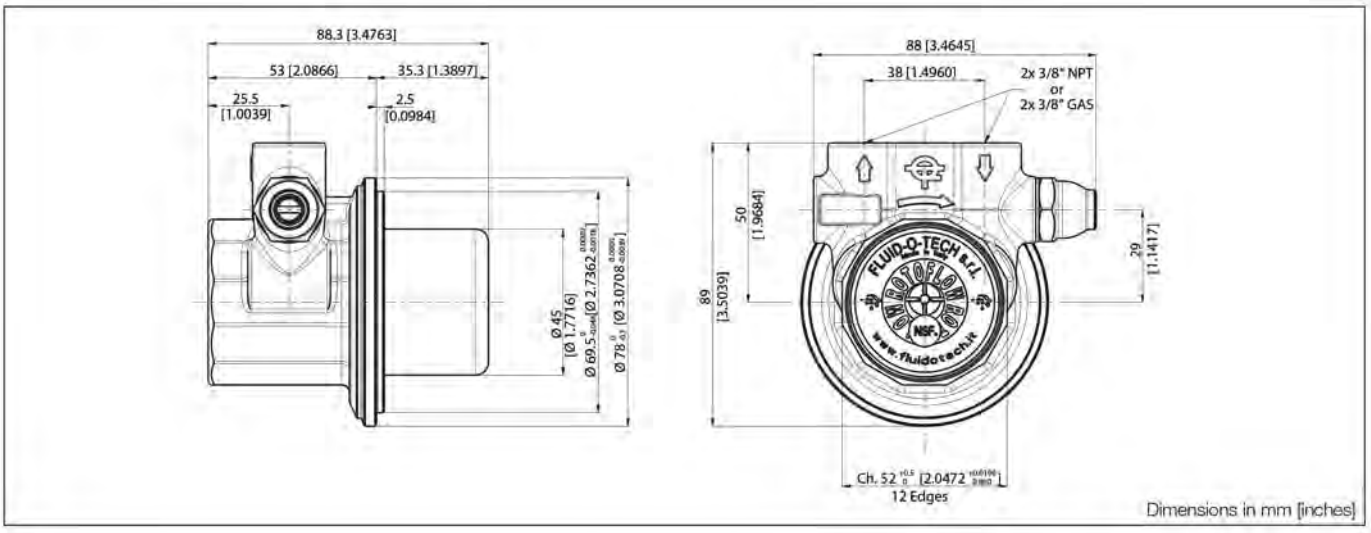
- Solar heating systems
- Refrigerating gas transfer
- Cooling systems
- Carpet cleaners

SPECIFICATIONS

Pump Housing: AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)

Seals: NBR (Viton, EPDM upon request)
Max Size Solid Particles : 20 microns
Max Motor Speed : 1725 rpm
Max System Pressure : 20 Bar (290 psi)
Pump Weight: 1.0 kg(2.2 lb)

DIMENSIONS (MM)



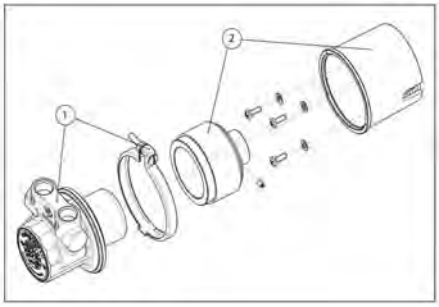


Table 1

Motor Adapter		
Position	**Description**	**Part Number**
1	TH Series Pump	Table 2
2	High Torque Mounting Assembly (M56-B16) High Torque Mounting Assembly (M63-B14) High Torque Mounting Assembly (NEMA 56C)	TMBS56C TMBS63C TMBS5BC

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ABOUT RELIEF VALVES

Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for TM 300-400 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

PUMP MODEL SELECTION/FLOW CURVES

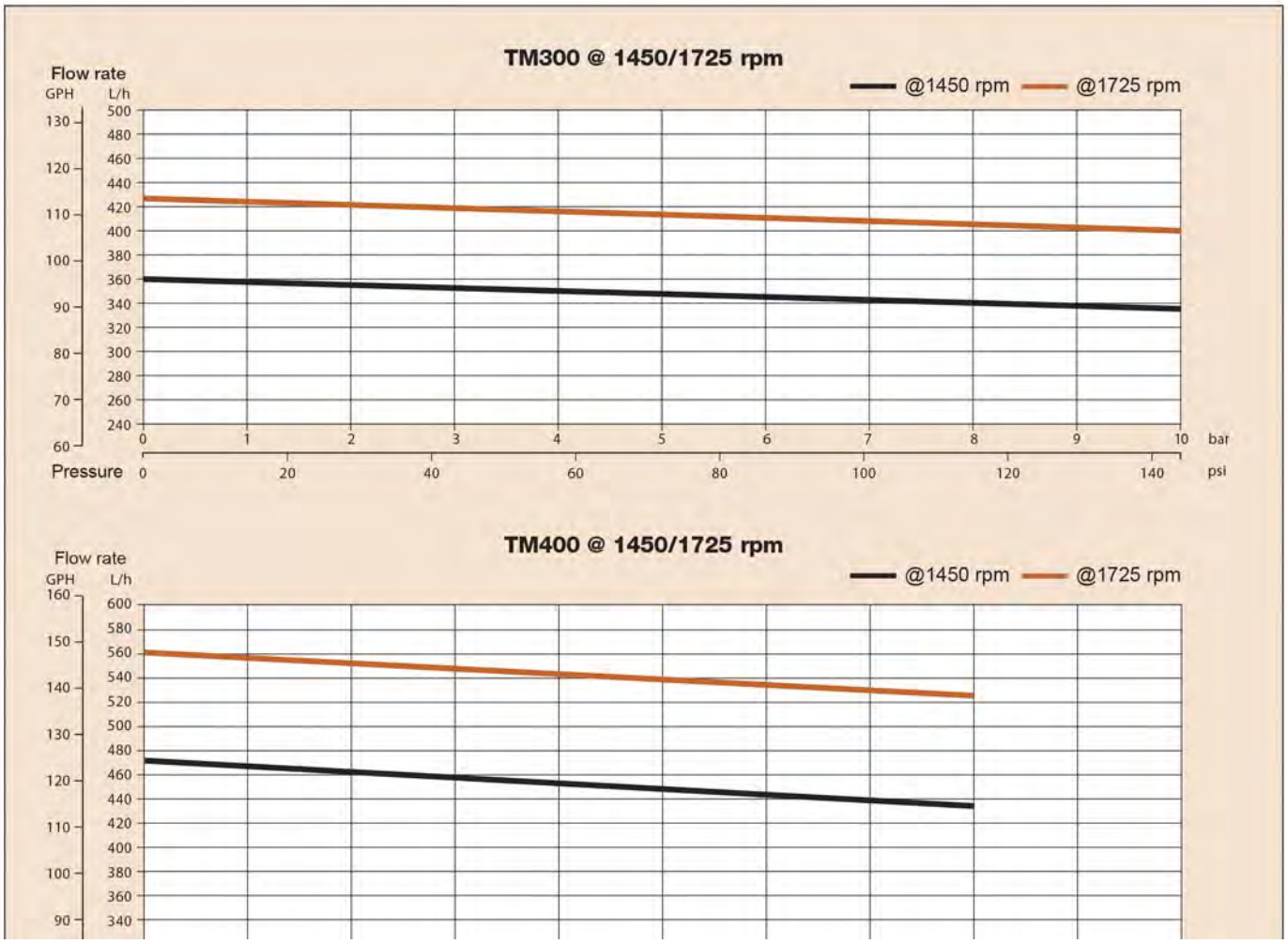


Table 2

Model	By-Pass
TMSS300	No
TMSS400	
TMSS301	Standard
TMSS401	
TMSS304	Balanced
TMSS404	

CLARK

Model TH 500-1000 Magnet Drive Rotary Vane Pump

Flow to 1250 LPH (330 GPH)

DESCRIPTION

The principle of the TH pump magnet drive is the driving force of the pole-to-pole alignment of 2 magnets. The driven magnet is attached to the pump shaft within the pump, while the driving magnet is attached to the motor shaft and closely located to the driven magnet. By means of magnetic attraction, the pump rotates in response to motor shaft rotation.

The TH housing is either brass or AISI 303 stainless steel with carbon graphite internal components. The pumps can be equipped with an optional built-in relief/bypass valve. Inlet and outlet ports have 1/2" NPT female threads. All models are available with NBR,Viton or EPDM static seals.Compared to conventional coupling, the magnet drive has several advantages :

1) No Mechanical Seals
2) Totally Sealed Body
3) Longer service life
4) Low Power Consumption
5) Noiseless operation

TYPICAL APPLICATIONS

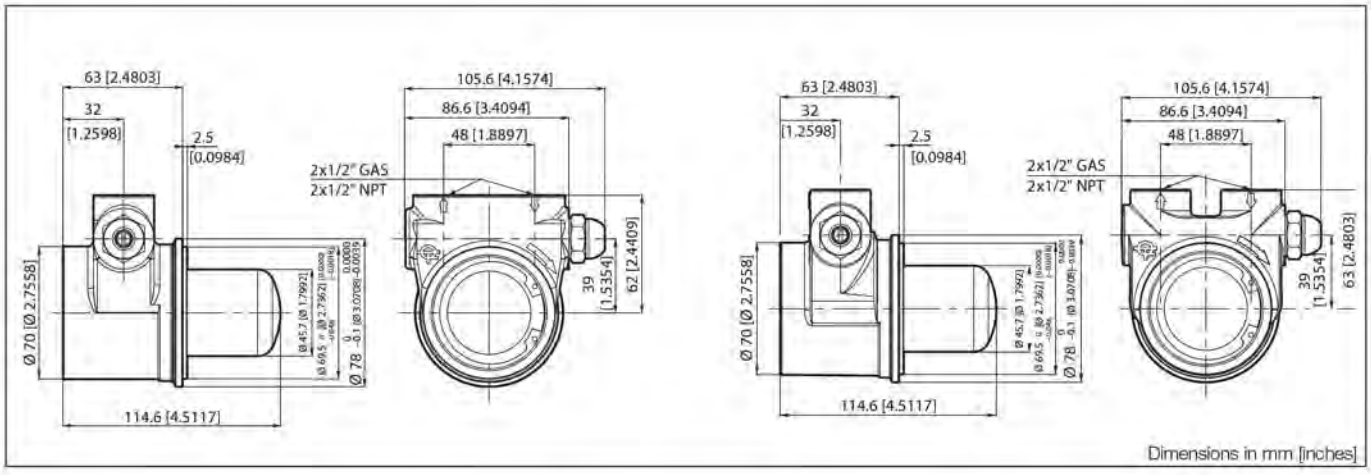
- Solar heating systems
- Refrigerating gas transfer
- Cooling systems
- Carpet cleaners

SPECIFICATIONS

Pump Housing: Brass or AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 1/2" NPT
Max Temperature : 70° C (158° F)

Seals: NBR (Viton, EPDM upon request)
Max Size Solid Particles : 20 microns
Max Motor Speed : 1725 rpm
Max System Pressure : 18 Bar (260 psi)
Pump Weight: 2.1 kg(4.6 lb)

DIMENSIONS (MM)



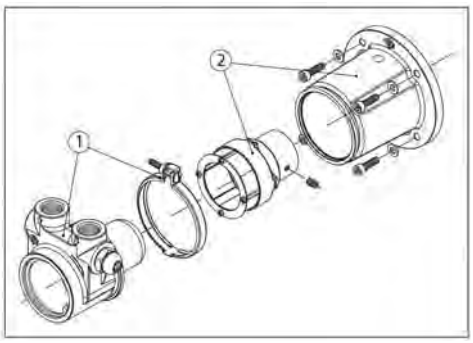


Table 1

Motor Adapter		
Position	**Description**	**Part Number**
1	TH Series Pump	Table 2
2	NEMA 56 Frame Motor ounting Assembly	THBS5BC

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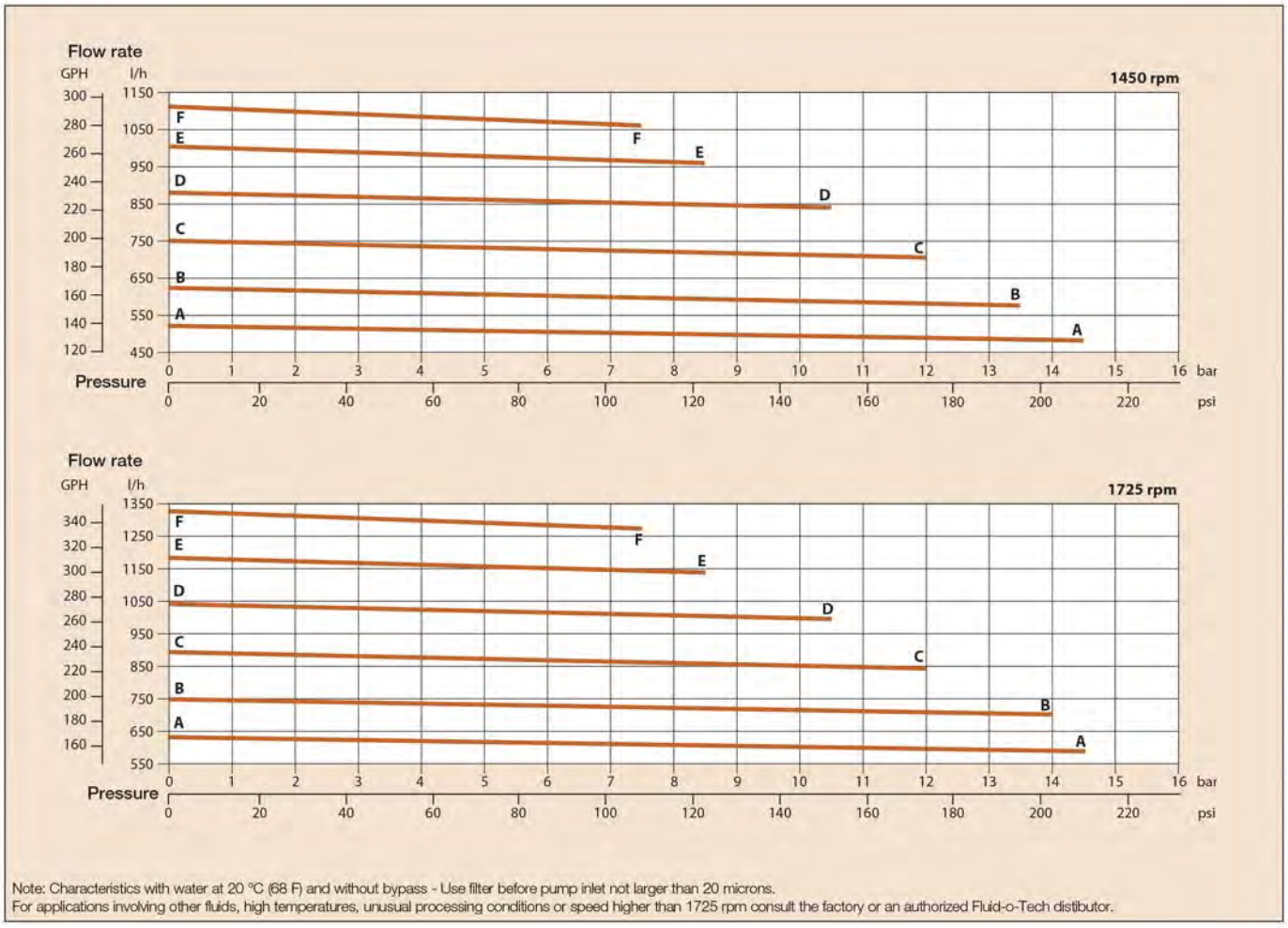
ABOUT RELIEF VALVES

Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 220 PSI for TM 500-1000 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

PUMP MODEL SELECTION/FLOW CURVES



Note: Characteristics with water at 20 °C (68 F) and without bypass - Use filter before pump inlet not larger than 20 microns.
For applications involving other fluids, high temperatures, unusual processing conditions or speed higher than 1725 rpm consult the factory or an authorized Fluid-o-Tech distibutor.

Table 2

Model	By-Pass	Housing	Figure
THSS500A	No	Stainless Steel	A-A
THSS600A			B-B
THSS700A			C-C
THSS800A			D-D
THSS900A			E-E
THSS1000A			F-F
THSS501A	Standard		A-A
THSS601A			B-B
THSS701A			C-C
THSS801A			D-D
THSS901A			E-E
THSS1001A			F-F

Model	By-Pass	Housing	Figure
THOT500A	No	Brass	A-A
THOT600A			B-B
THOT700A			C-C
THOT800A			D-D
THOT900A			E-E
THOT1000A			F-F
THOT501A	Standard		A-A
THOT601A			B-B
THOT701A			C-C
THOT801A			D-D
THOT901A			E-E
THOT1001A			F-F

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CLARK

TMFR 30-200 Series Magnetic Drive Rotary Vane Pump

Integral Motor & Driver/Speed Controller, Flow to 150 gph, Pressure to 230 PSI

DESCRIPTION

The TMFR series, an integrated pump-motor unit where the motor has no moving parts, features a combination of compact size, superior performance, low energy consumption and silent operation to provide great versatility in a refined, high tech design.

The internal magnet, driven through an electromagnetic field, is capable of transmitting high torque to the shaft. The speed control system allows the unit to self-adapt to the hydraulic conditions of the circuit to maintain a set pressure or flow rate, while the brushless technology provides a reliable and long lasting operation.

Model TMFR & Power Supply/Speed Controller

SPECIFICATIONS

Pump Housing Material: AISI 303 stainless steel
Model Selection/Flow Characteristics: See Table 1
Pumping Chamber: Carbon graphite
Ports: 3/8" NPT
Internal Bypass/Pressure Relief Valve: Standard or balanced on select models
Max Static Pressure: 20 bar/290 psi
Noise: 46dB (A) at 1500 rpm
Unit Weight (w/o controller): 2.7 kg (5.9 Lb)
Max. Operative Temperature: 70 °C (158 F)
Motor type: 115 V AC, 230 V AC 50/60 Hz
Speed Range: 1100 to 3500 rpm
Duty: Continuous
Absorbed Power: Max 330 W
Actual Power: Max 250 W
Motor IP protection: IP 20

-Compact Size	***-Motor Housing in Aluminum***
-No Wear on Motor	***-Continuous Duty***
-Speed Control	

Typical Applications	
-Laser Cooling	**-Fuel Burner**
-Solar Heating	**-Water Pressurization**
-Reverse Osmosis	**-Post Mix Systems**
-Welding	**-Expresso Machines**

CONTROLLER OPERATING MODES

1) ON-OFF by Main Power Supply & DIP Switch Settings:
In this mode a choice of eight speed selections are available and field programmed via a six position DIP switch. Speed choices are 1100 rpm, 1500 rpm, 1750 rpm, 2000 rpm, 2500 rpm, 2750 rpm, 3000 rpm &3500 rpm.

2) OPTO DIGITAL ON/OFF :
In this mode speed selections are made as above and motor is turned on & off by remote command.

3) OPTO DIGITAL (External DIP):
In this mode a choice of four speed selections and on-off control are by remote command. Speed selections are 1100 rpm, 1500 rpm, 2000 rpm & 2500 RPM

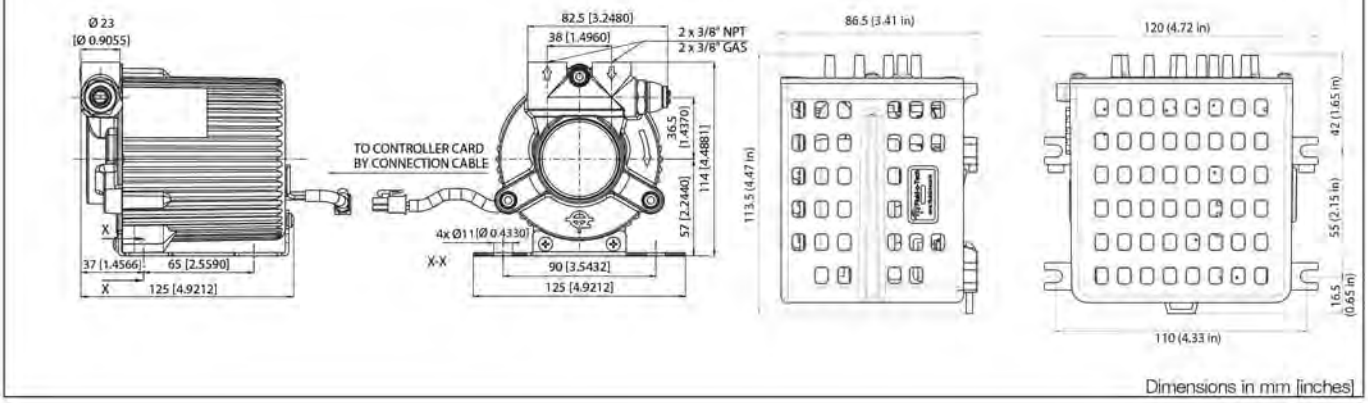
4) ANALOG COMMAND with ON-OFF OPTO DIGITAL :
In this mode speed is controlled between 500 rpm to 3500 rpm with a choice of standard analog inputs (0-5 V or 4-20 mA). Selection of a PWM command of 100-10,000 Hz is also available.

Fault Ouptuts:

The TMFR/TSFR driver has a fault signal in OR function which includes the alarms (Autoresettable and Permanent):

1 - Over-voltage
2 - Under-voltage
3 - Over-temperature
4 - Start-up
5 - Rotor blocked
6 – Module Fault (hardware)
7 - Over-current power
8 - Over-current hardware limit (50% more than the over-current power)

DIMENSIONS



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ABOUT RELIEF VALVES

Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. When not customer specified the TMFR relief valve cracking pressure is factory set at approximately 180 PSI at mid speed range.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

MODEL SELECTION/FLOW CURVES

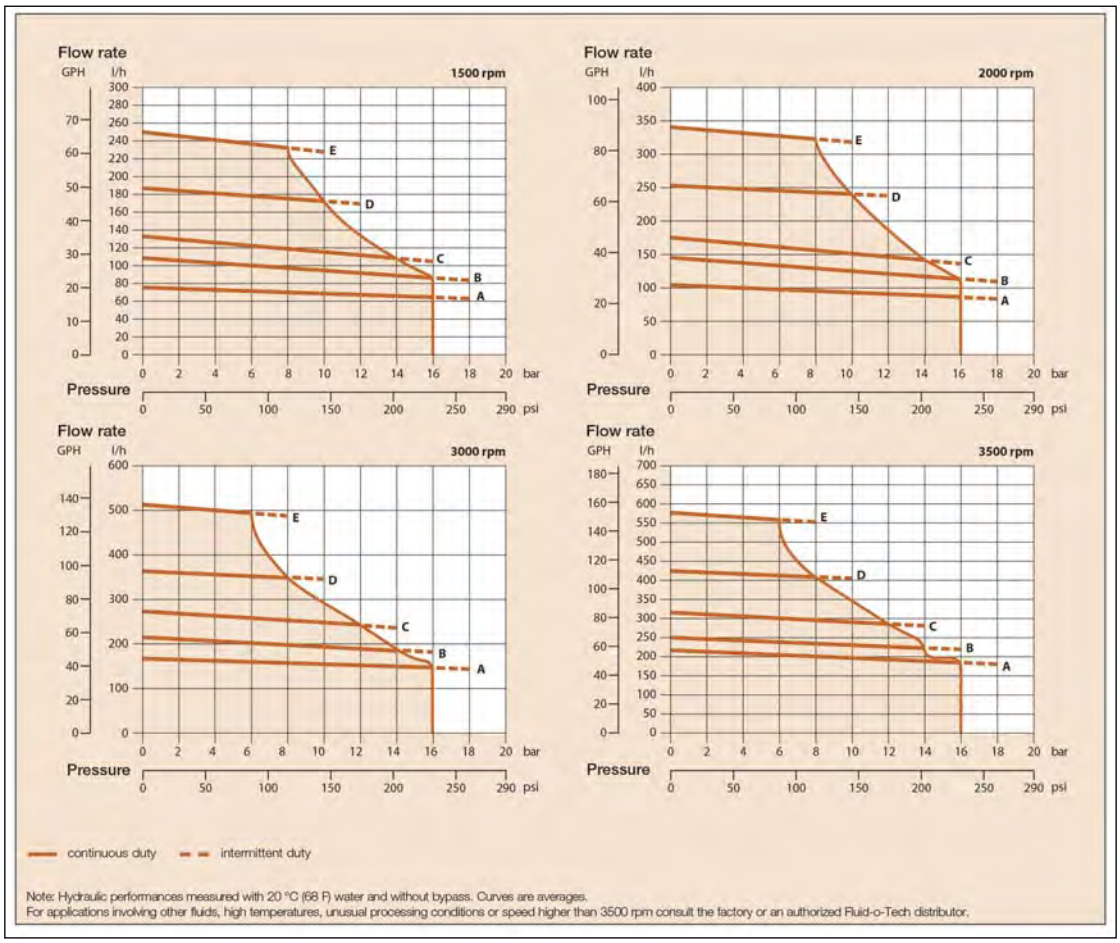


Table 1

Stainless Model TMFRSS	050	051	070	074	100	101	150	151	200	204
Figure	A-A		B-B		C-C		D-D		E-E	
Relief Valve	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD

ORDERING INFORMATION

MODEL: AB-C-D

EXAMPLE- TMFRSS074-115-90

A Model	B Pump Code	C Power Supply	D Relief Valve Crack Pressure
*TMFRSS= Stainless Steel	See Tables 1	115= 110 VAC, single phase 230= 230 VAC, single phase	-None Specified XXX- Specify in PSI
* Brass model TMFROT is available in OEM quantities, please call for details			

CLARK

TSFR 400 Series Magnetic Drive Rotary Vane Pump

Integral Motor & Driver/Speed Controller, Flow to 1000 lph

DESCRIPTION

Designed for those applications where many hours of operation are required, the TSFR delivers up to 1000 l/h on a continuous duty base. The TSFR, an integrated pump-motor unit where the motor has no moving parts, features a combination of compact size, superior performance, low energy consumption and silent operation to provide great versatility in a refined, high tech design.

The internal magnet, driven through an electromagnetic field, is capable of transmitting high torque to the shaft. The speed control system allows the unit to self-adapt to the hydraulic conditions of the circuit to maintain a set pressure or flow rate, while the brushless technology provides a reliable and long lasting operation.

Model TMFR & Power Supply/Speed Controller

-Compact Size	***-Motor Housing in Aluminum***
-No Wear on Motor	***-Continuous Duty***
-Speed Control	

SPECIFICATIONS

Pump Housing Material: AISI 303 stainless steel
Model Selection/Flow Characteristics: See Table 1
Pumping Chamber: Carbon graphite
Ports: 3/8"NPT
Internal Bypass/Pressure Relief Valve: Standard or balanced on select models
Max Static Pressure: 20 bar/290 psi
Noise: 49dB (A) at 1500 rpm
Unit Weight (w/o controller): 2.8 kg (6.2 Lb)
Max. Operative Temperature: 70 °C (158 F)
Motor type: 115 V AC, 230 V AC 50/60 Hz
Speed Range: 1100 to 3500 rpm
Duty: Continuous
Absorbed Power: Max 330 W
Actual Power: Max 250 W
Motor IP protection: IP 20

Typical Applications	
-Laser Cooling	**-Fuel Burner**
-Solar Heating	**-Water Pressurization**
-Reverse Osmosis	**-Post Mix Systems**
-Circuit Washing	**-Welding**

CONTROLLER OPERATING MODES

1) ON-OFF by Main Power Supply & DIP Switch Settings:
In this mode a choice of eight speed selections are available and field programmed via a six position DIP switch. Speed choices are 1100 rpm, 1500 rpm, 1750 rpm, 2000 rpm, 2500 rpm, 2750 rpm, 3000 rpm &3500 rpm.

2) OPTO DIGITAL ON/OFF :
In this mode speed selections are made as above and motor is turned on & off by remote command.

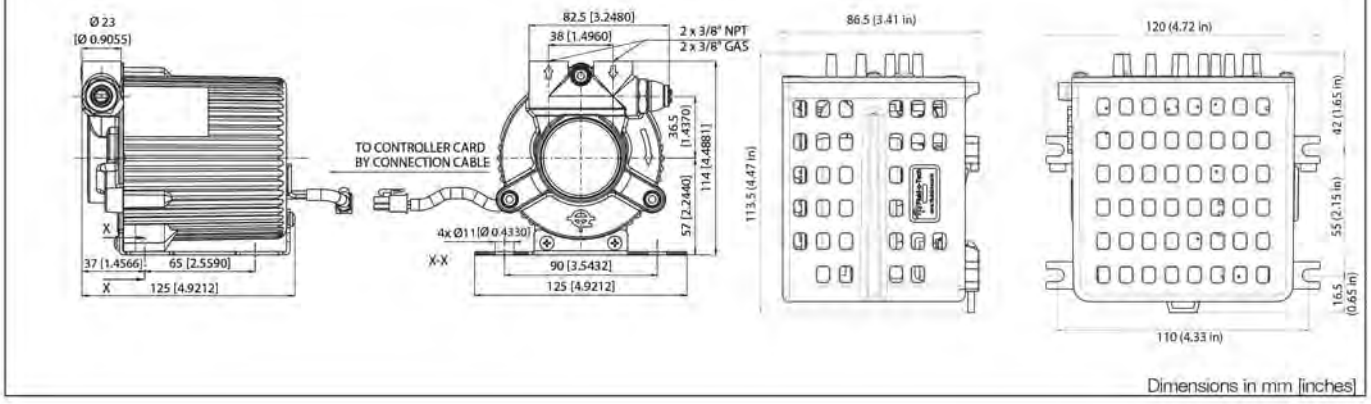
3) OPTO DIGITAL (External DIP):
In this mode a choice of four speed selections and on-off control are by remote command. Speed selections are 1100 rpm, 1500 rpm, 2000 rpm & 2500 RPM

4) ANALOG COMMAND with ON-OFF OPTO DIGITAL :
In this mode speed is controlled between 500 rpm to 3500 rpm with a choice of standard analog inputs (0-5 V or 4-20 mA). Selection of a PWM command of 100-10,000 Hz is also available.

Fault Ouptuts:
The TMFR/TSFR driver has a fault signal in OR function which includes the alarms (Autoresettable and Permanent):

1 - Over-voltage
2 - Under-voltage
3 - Over-temperature
4 - Start-up
5 - Rotor blocked
6 – Module Fault (hardware)
7 - Over-current power
8 - Over-current hardware limit (50% more than the over-current power)

DIMENSIONS



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ABOUT RELIEF VALVES

Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. When not customer specified the TSFR relief valve cracking pressure is factory set.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

MODEL SELECTION/FLOW CURVES

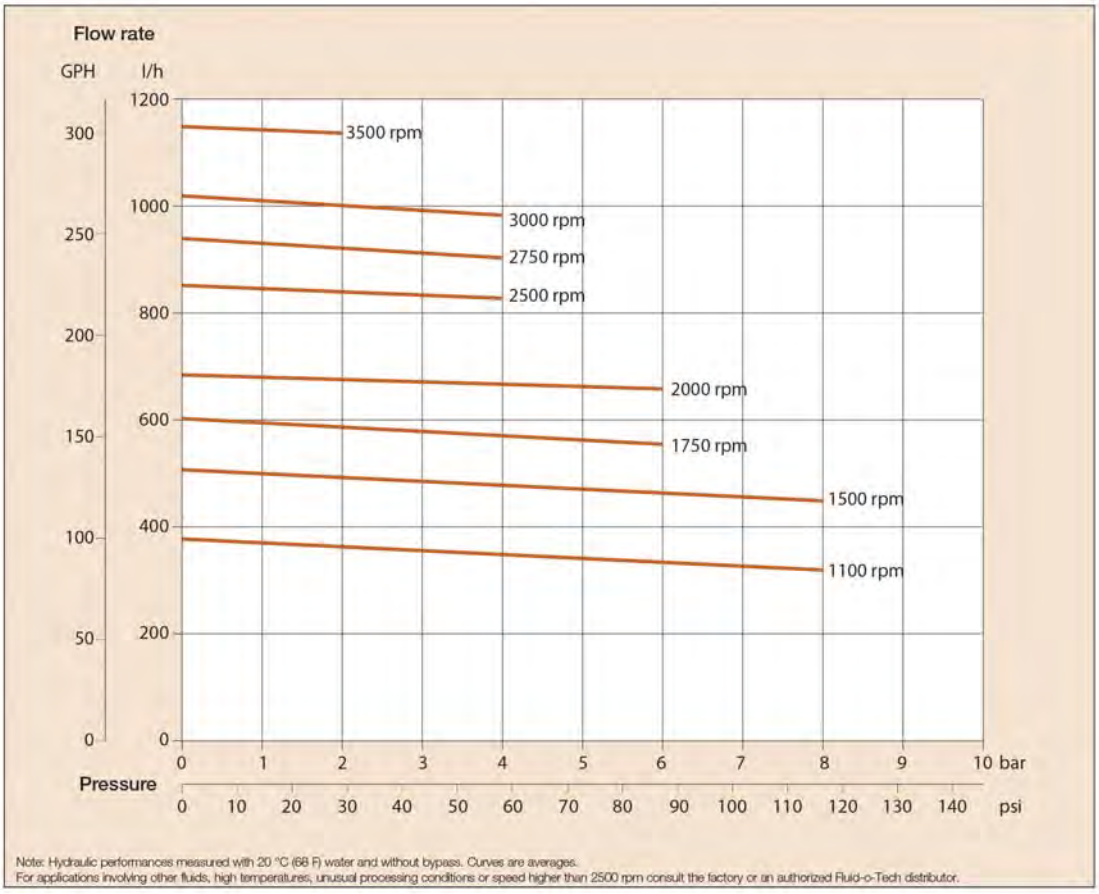

Table 1

Stainless Model TSFRSS	400	401
Relief Valve	NO	STD

ORDERING INFORMATION

MODEL: AB-C-D
EXAMPLE- TSFR400115

A Model	B Pump Code	C Power Supply	D Relief Valve Crack Pressure
TSFRSS= Stainless Steel	See Tables 1	115= 110 VAC, single phase 230= 230 VAC, single phase	-None Specified XXX- Specify in PSI

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CLARK
Compact Series Rotary Vane Pumps
Flow to 63 GPH, Pressure to 230 PSI

DESCRIPTION
The Compact and Compact Plus series rotary vane pumps are the smallest series of our line of positive displacement pumps. Capable of high performances despite the small size, the Compact and Compact Plus series is the choice when space is an issue.

The Compact series housing is brass made only, while the Compact Plus series, equipped with ball bearings supporting the rotor, is available in brass or stainless steel AISI 303.

Both are assembled with a stainless steel AISI 303 rotor, carbon graphite pumping chamber and NBR seals. The inlet and outlet ports are 3/8" NPT threaded.

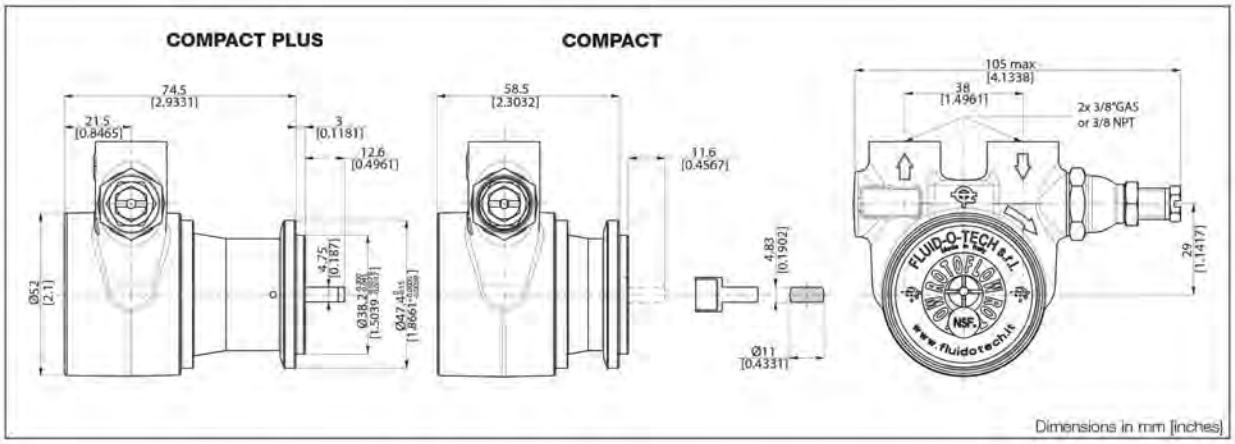
The pumps can be connected to direct coupling motors with a stainless steel clamp.

The "Compact" pump is equipped (depending on model number) with a built-in relief valve. Shaft sealing is provided by a mechanical face seal.The inlet and outlet ports are 3/8" NPT female threaded.

TYPICAL APPLICATIONS
- Beverage vending machines
- Cooling systems
- Ultra Filtration
- Cooling systems

SPECIFICATIONS
Pump Housing: Brass or AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton, EPDM upon request)

Max Size Solid Particles : 10 microns
Max Motor Speed : 1725 rpm
Min. Starting Torque:0.5 Nm
Max System Pressure : 20 Bar (290 psi)
Pump Weight: CA, 850g (1.9 lb)
MA 1 Kg (2.2 lb)

DIMENSIONS


Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 180 PSI for CA & MA series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

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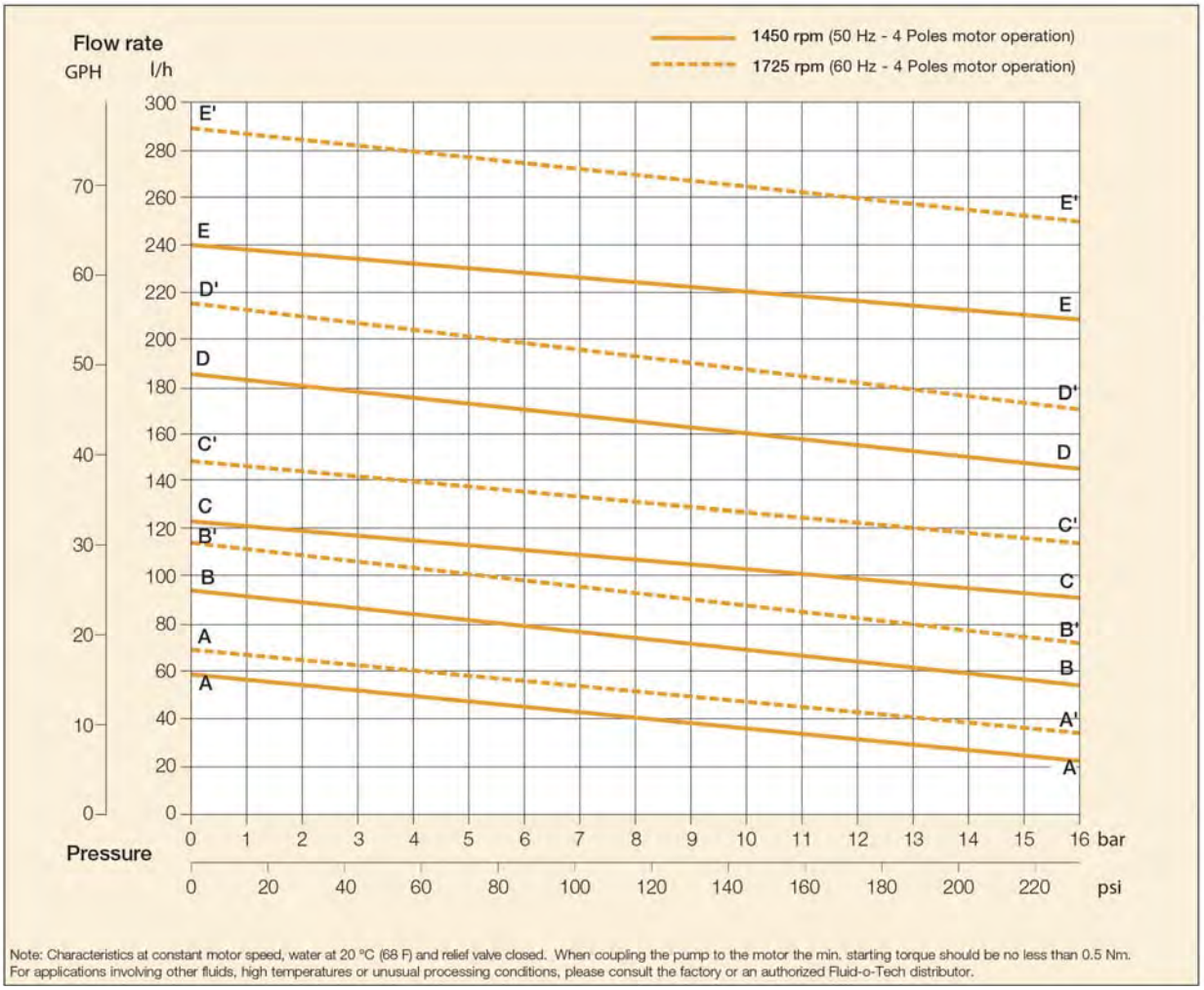
PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER

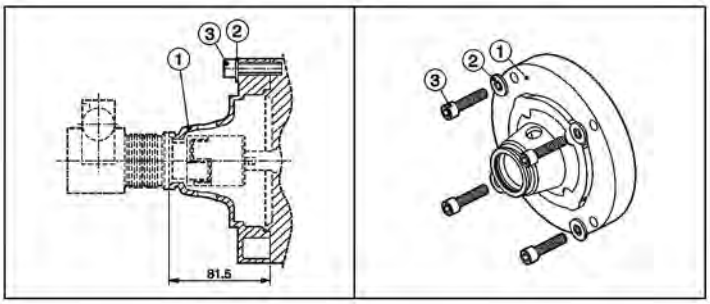


Note: Characteristics at constant motor speed, water at 20 °C (68 F) and relief valve closed. When coupling the pump to the motor the min. starting torque should be no less than 0.5 Nm.
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

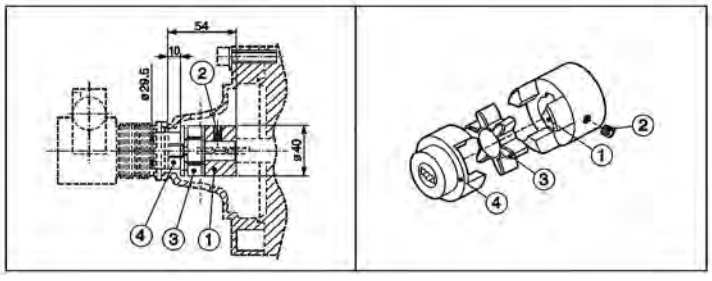
Model	CA050	CA051	CA054	CA070	CA071	CA074	CA100	CA101	CA104	CA150	CA151	CA154	CA200	CA201	CA204
Flow Figure	A-A			B-B			C-C			D-D			E-E		
Relief Valve	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL

Model-Stainless	MA0510	MA0511	MA0514	MA0710	MA0711	MA0714	MA110	MA111	MA114	MA1510	MA1511	MA1514	MA210	MA211	MA214
Model-Brass	MA050	MA051	MA054	MA070	MA071	MA074	MA100	MA101	MA104	MA150	MA151	MA154	MA200	MA201	MA204
Flow Figure	A-A			B-B			C-C			D-D			E-E		
Relief Valve	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL

Model 92-80-03 NEMA 56C Adapter	
#	Description
1	NEMA 56C Adapter
2	10 mm Washer
3	Screw 1 3/8-16x38 UNC



Model 91-81-11 NEMA 56C Coupling	
#	Description
1	Coupling w/5/8" Bore
2	M6 x 8 Set Screw
3	Spider
4	Coupling, Flat Side



CLARK
Series PA 70-400 Brass Rotary Vane Pumps
Flow to 140 GPH, Pressure to 200 PSI

DESCRIPTION
The PA series rotary vane pumps are available in 8 displacements to achieve the desired flow rate when close coupled to a motor and operated at the motor rpm. The pump housing is brass. The rotor is AISI 303 stainless steel, and the pump chamber and vanes are carbon graphite. A built-in strainer and relief valve are available on certain models. Shaft sealing is provided by a mechanical face seal.

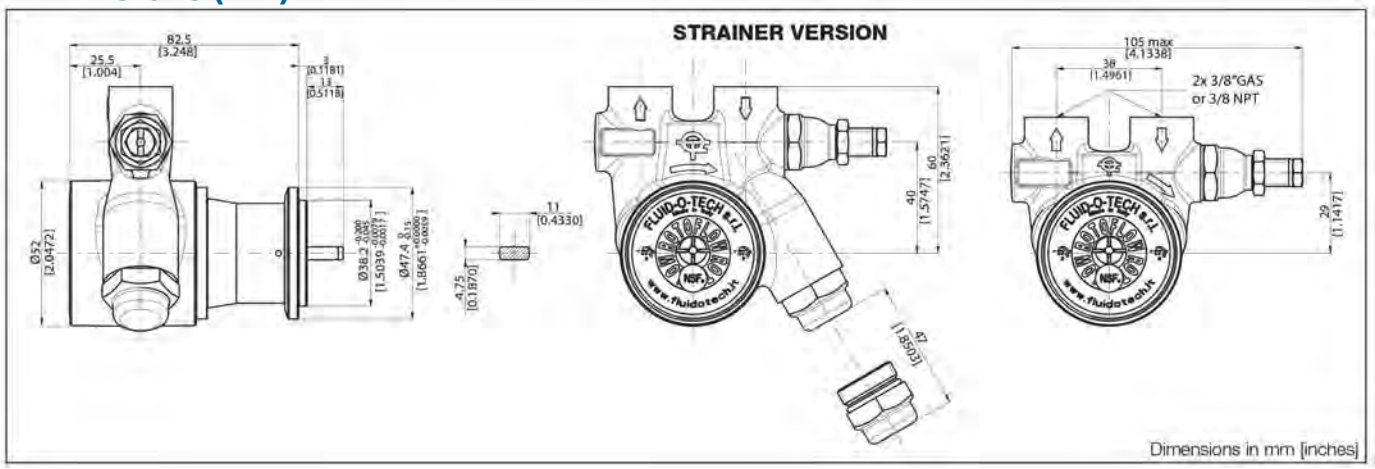
The inlet and outlet ports are 3/8" NPT female threaded. The pump is optionally equipped with a built-in by-pass; a special balanced by-pass (able to maintain the set pressure for variations of the inlet pressure) is available upon request.

PA pumps are NSF listed pumps for potable water and are suitable for clean, non-hazardous fluids only.

TYPICAL APPLICATIONS
- Beverage vending machines
- Post-mix dispensers
- Soda circulation
- Reverse osmosis systems
- Cooling systems

SPECIFICATIONS
Pump Housing: Brass
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton, EPDM upon request)
Max Motor Speed : 1725 rpm
Max Differential Pressure: 15.9 Bar (230 PSI)
Max System Pressure : 20 Bar (290 psi)
Built-in Strainer: 100 mesh, see model table for availability
Flange Mounting: Optionally available
Pump Weight: w/o strainer- 1.1 kg (2.5 lb)
w/strainer- 1.3 kg (2.9 lb)

DIMENSIONS (MM)



Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for PA 70-400 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

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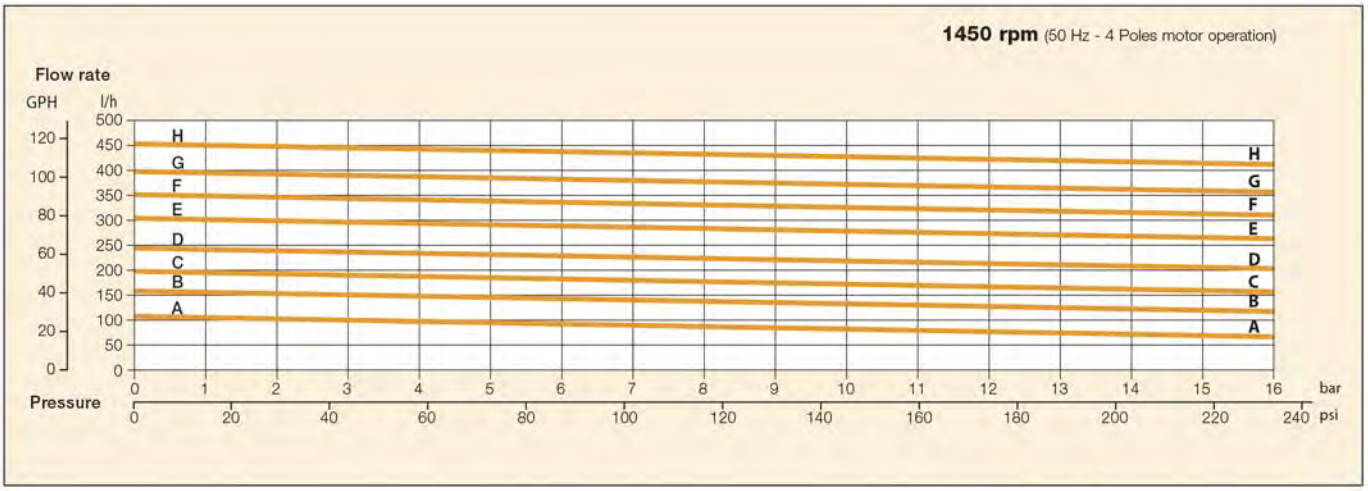
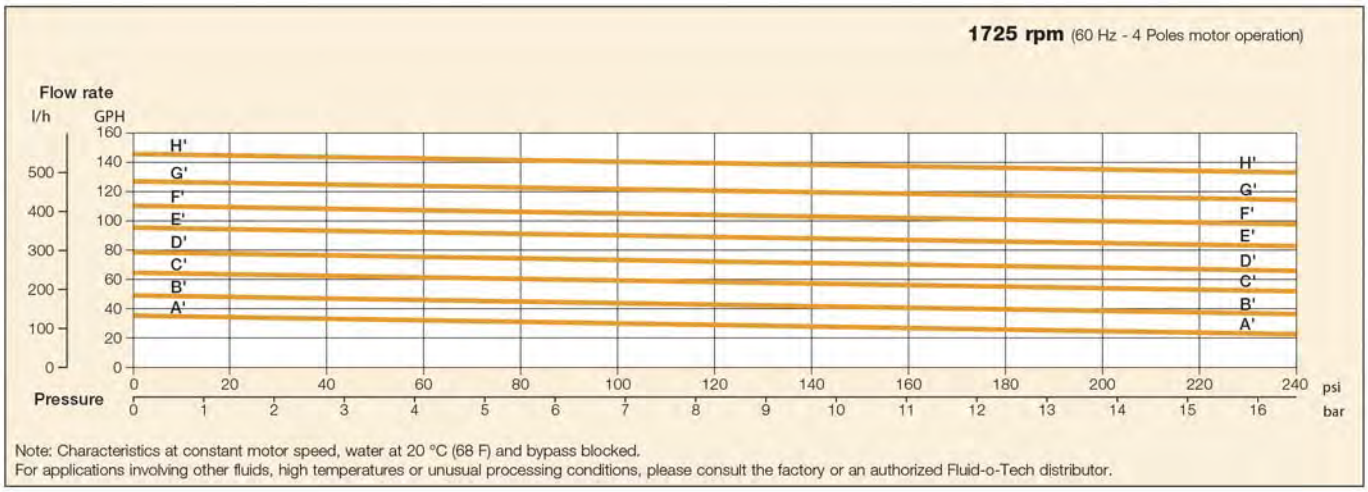
PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER





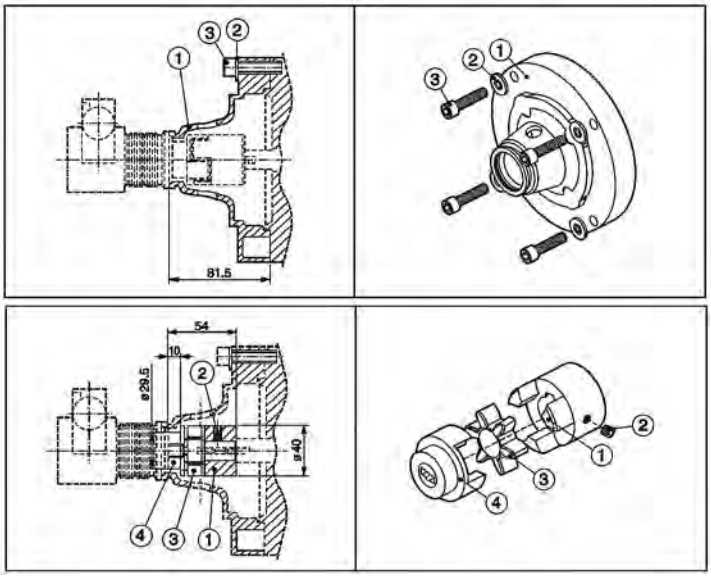
Note: Characteristics at constant motor speed, water at 20 °C (68 F) and bypass blocked.
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

Model	PA070	PA071	PA074	PA071X	PA074X	PA100	PA101	PA104	PA101X	PA104X	PA1500	PA1501	PA1504	PA1601X	PA1504X	PA200	PA201	PA204	PA201X	PA204X
Flow Figure	A-A					B-B					C-C					D-D				
Relief Valve	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL
Strainer	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES

Model	PA2500	PA2501	PA2504	PA2501X	PA2504X	PA300	PA301	PA304	PA301X	PA304X	PA3500	PA3501	PA3504	PA3601X	PA3504X	PA400	PA401	PA404	PA401X	PA404X
Flow Figure	E-E					F-F					G-G					H-H				
Relief Valve	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL	NO	STD	BAL	STD	BAL
Strainer	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES

Model 92-80-03 NEMA 56C Adapter	
#	Description
1	NEMA 56C Adapter
2	10 mm Washer
3	Screw 1 3/8-16x38 UNC

Model 91-81-11 NEMA 56C Coupling	
#	Description
1	Coupling w/5/8" Bore
2	M6 x 8 Set Screw
3	Spider
4	Coupling, Flat Side



CLARK

Series PA 70-400 Stainless Steel Rotary Vane Pumps

Flow to 140 GPH, Pressure to 200 PSI

DESCRIPTION

The PA Stainless series rotary vane pumps are available in 8 displacements to achieve the desired flow rate when close coupled to a motor and operated at the motor rpm. The pump housing and rotor are AISI 303 stainless steel, and the pump chamber and vanes are carbon graphite. Shaft sealing is provided by a mechanical face seal.

The inlet and outlet ports are 3/8" NPT female threaded. A built-in adjustable by-pass to protect the pump and the system from unexpected pressure spikes is an available option. The pump can be connected to direct coupling motors with a stainless steel clamp or to M71 and M80 UNELMEC or NEMA 56C frame motors with optional coupling and adaptor sets.

PA pumps are NSF listed pumps for potable water and are suitable for clean, non-hazardous fluids only. Max speed is 1725 rpm.

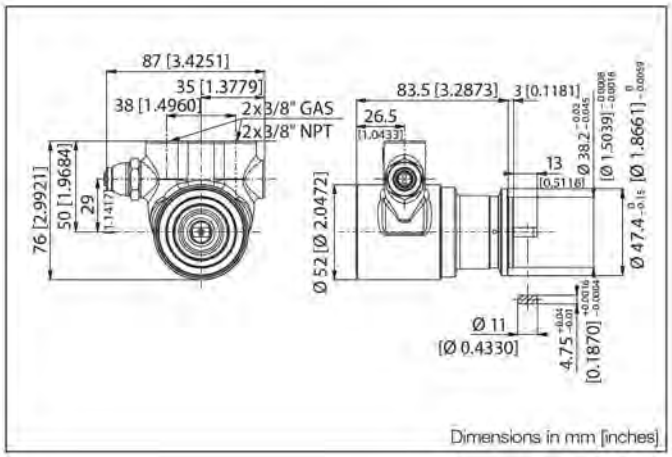
TYPICAL APPLICATIONS

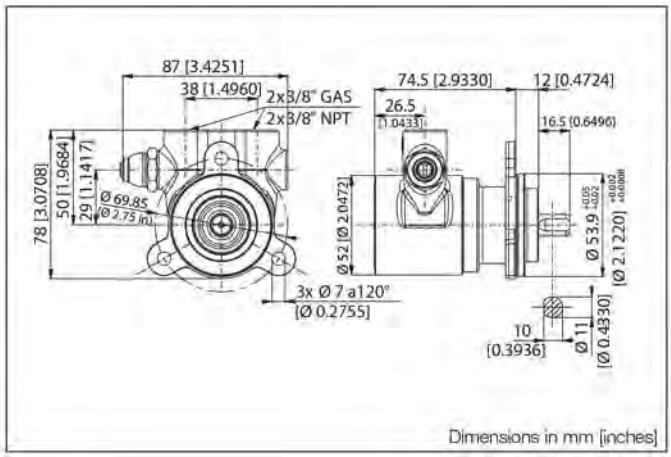
- Beverage vending machines
- Post-mix dispensers
- Soda circulation
- Reverse osmosis systems
- Cooling systems

SPECIFICATIONS

Pump Housing: AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 3/8" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton, EPDM upon request)
Max Motor Speed : 1725 rpm
Max Differential Pressure: 15.9 Bar (230 PSI)
Max System Pressure : 20 Bar (290 psi)
Mounting: Clamp or Flange
Pump Weight: clamp mount- 1.2 kg (2.7 lb)
flange mount- 1.5 kg (3.3 lb)

DIMENSIONS (MM)





Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for PA 70-400 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

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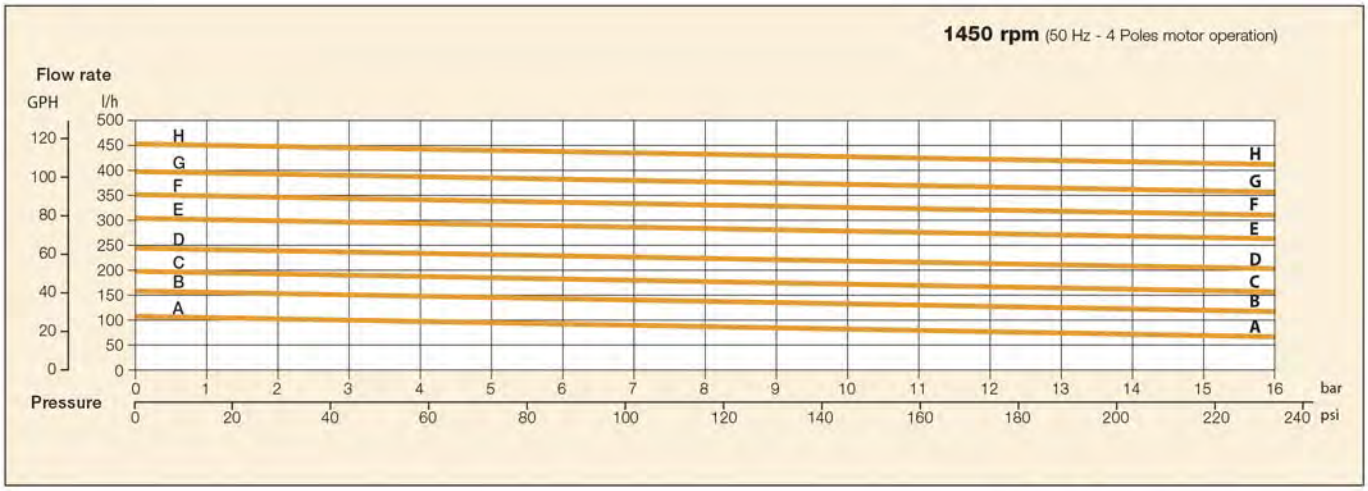
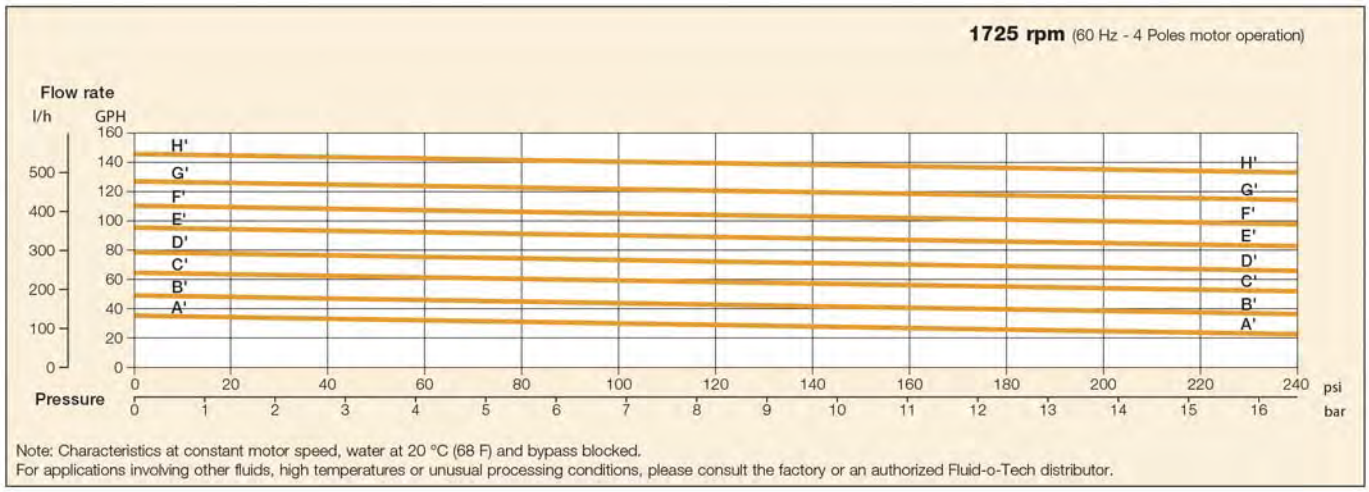
PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER



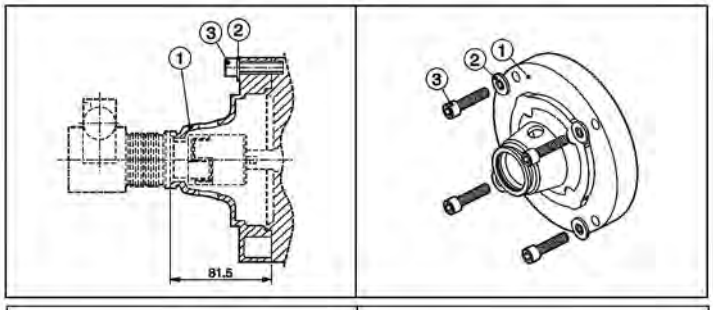


Note: Characteristics at constant motor speed, water at 20 °C (68 F) and bypass blocked.
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

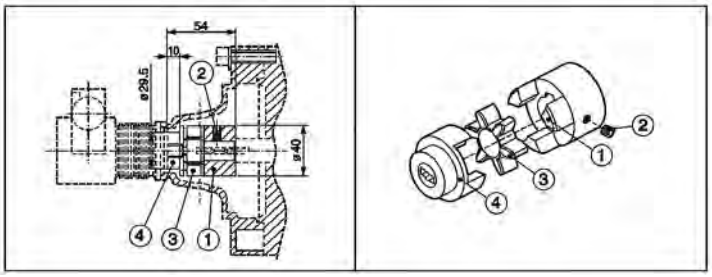
Model	PA0710	PA0711	PA0711F	PA110	PA111	PA111F	PA1510	PA1511	PA1511F	PA210	PA211	PA211F
Flow Figure	A-A			B-B			C-C			D-D		
Mounting	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange
Relief Valve	NO	STD	STD	NO	STD	STD	NO	STD	STD	NO	STD	STD

Model	PA2510	PA2511	PA511F	PA310	PA311	PA311F	PA3510	PA3511	PA3511F	PA410	PA411	PA411F
Flow Figure	E-E			F-F			G-G			H-H		
Mounting	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange
Relief Valve	NO	STD	STD	NO	STD	STD	NO	STD	STD	NO	STD	STD

Model 92-80-03 NEMA 56C Adapter	
#	Description
1	NEMA 56C Adapter
2	10 mm Washer
3	Screw 1 3/8-16x38 UNC



Model 91-81-11 NEMA 56C Coupling	
#	Description
1	Coupling w/5/8" Bore
2	M6 x 8 Set Screw
3	Spider
4	Coupling, Flat Side



CLARK

Series PA 500-1000 Brass & SS Rotary Vane Pumps

Flow to 316 GPH, Pressure to 230 PSI

DESCRIPTION

The PA 500-1000 series high volume rotary vane pumps are available in 6 flow ratings to meet the needs of high capacity pumping.

The rotary vane pump with brass or stainless steel housing utilizes a stainless steel AISI 304 rotor, while the pumping chamber and the vanes are in graphite carbon.

Inlet and outlet ports are ½" NPT female threaded.

Certain models are equipped with a built-in adjustable relief valve.

The pump can be connected to a motor with a metallic clamp or through an adapter and a flexible coupling.

SPECIFICATIONS

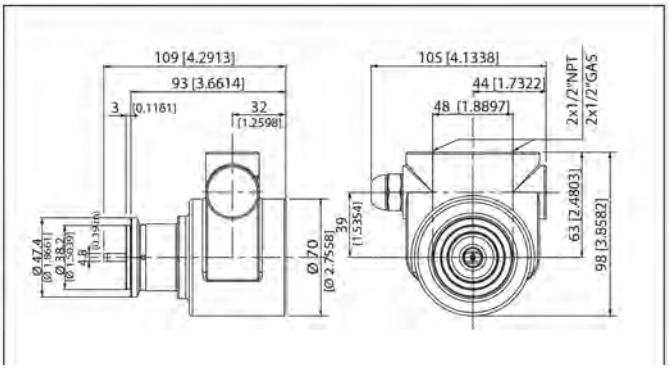
Pump Housing: Brass or AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 1/2" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton, EPDM upon request)
Max Motor Speed : 1725 rpm
Max System Pressure : 20 Bar (290 psi)
Mounting: Clamp or Flange
Pump Weight: clamp mount- 1.9 kg (4.2 lb)
flange mount- 2 kg (4.4 lb)

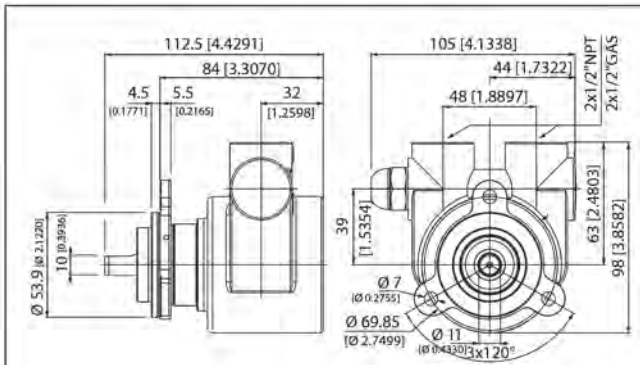
TYPICAL APPLICATIONS

- Post mix dispensers
- Cooling and booster systems
- Reverse osmosis
- Fuel injection systems
- Ultra filtration

NSF/ANSI 169
Stainless steel models also evaluated and determined to possess weighted average lead content of <=0.25% and complies with lead content requirements for "lead free" plumbing as defined by California, Vermont, Maryland, and Louisiana state laws and the U.S. Safe Drinking Water Act.

DIMENSIONS (MM)





Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:
1) Standard Relief valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one side) to atmosphere is added to the downstream side of the standard check-valve assembly. This insures that cracking pressure of the relief valve remains unchanged regardless of changes in inlet pressure (that might be a condition in a pressurized system).

The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 220 PSI for PA 500-1000 series.

It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

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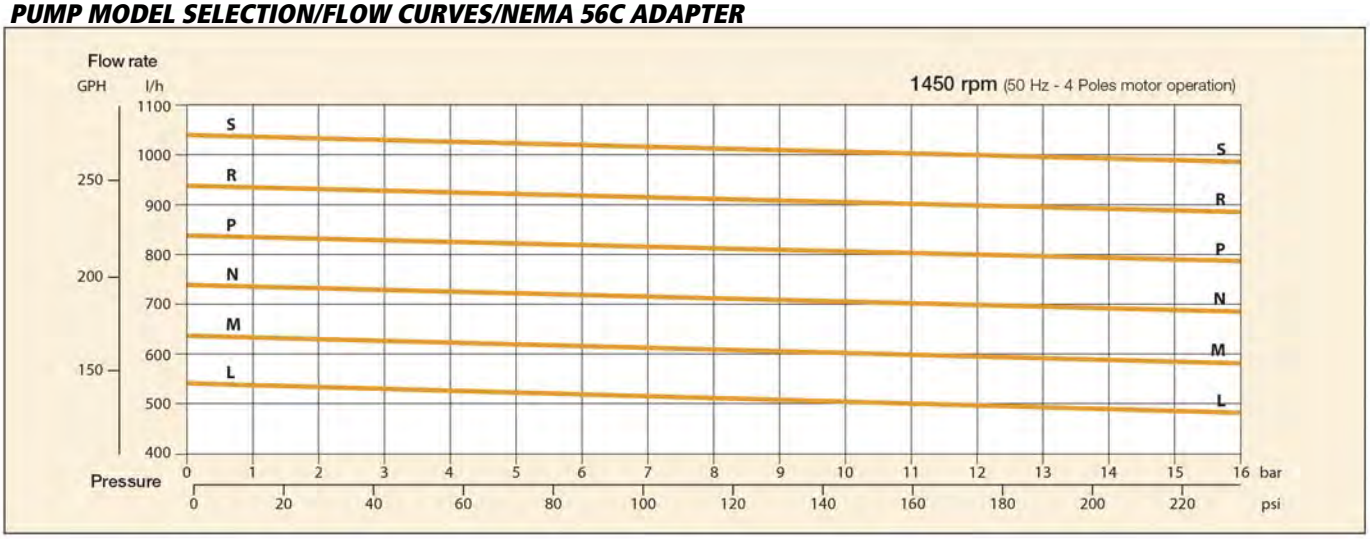
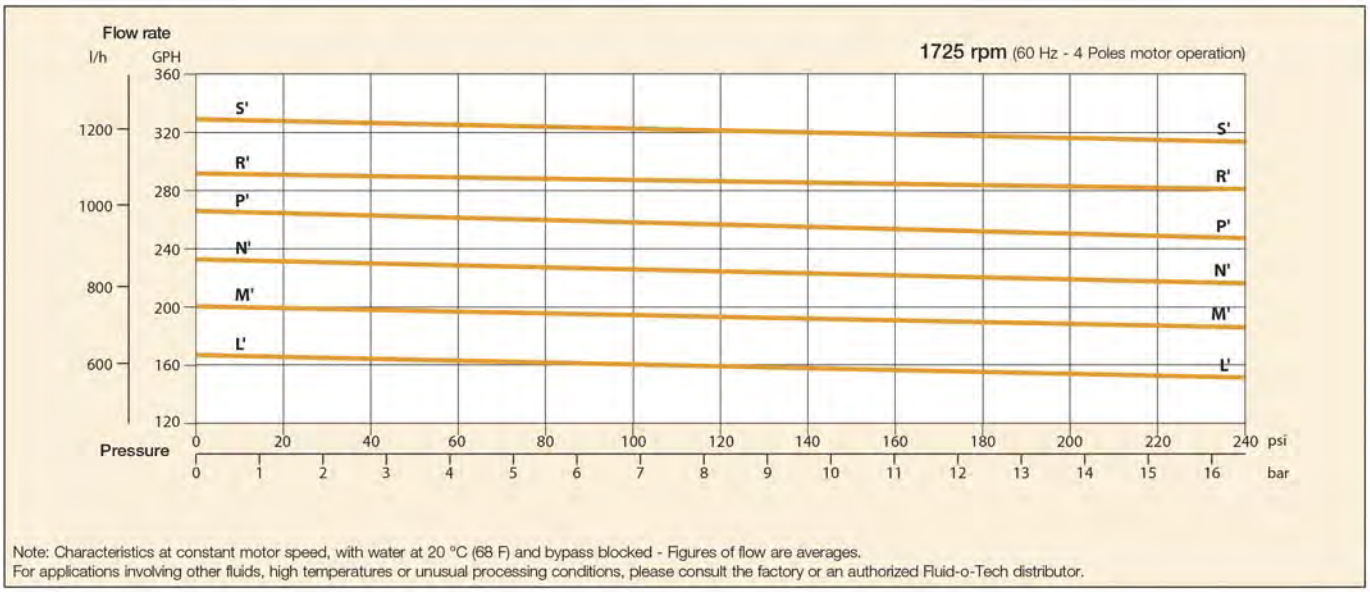
PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER



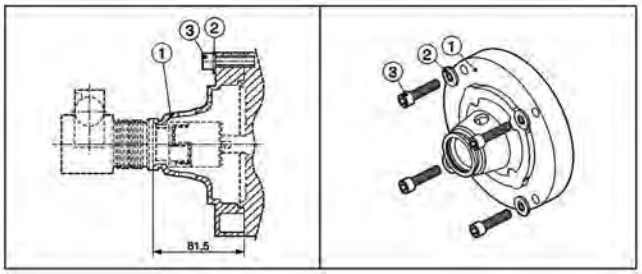


Note: Characteristics at constant motor speed, with water at 20 °C (68 F) and bypass blocked - Figures of flow are averages.
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

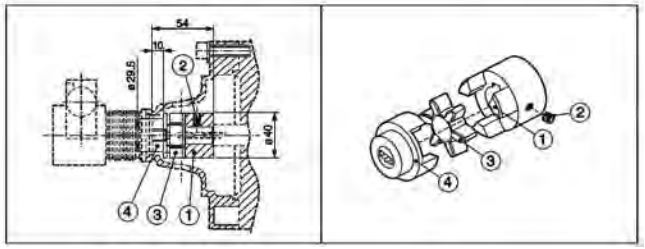
Brass Model	PA500	PA501	PA500F	PA501F	PA600	PA601	PA600F	PA601F	PA700	PA701	PA700F	PA701F	PA800	PA801	PA800F	PA801F	PA900	PA901	PA900F	PA901F	PA1000	PA1001	PA1000F	PA1001F
Flow Figure	L-L				M-M				N-N				P-P				R-R				S-S			
Mounting	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange
Relief Valve	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD

SS Model	PA510	PA511	PA510F	PA511F	PA610	PA611	PA610F	PA611F	PA710	PA711	PA710F	PA711F	PA810	PA811	PA810F	PA811F	PA910	PA911	PA910F	PA911F	PA1010	PA1011	PA1010F	PA1011F
Flow Figure	L-L				M-M				N-N				P-P				R-R				S-S			
Mounting	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange
Relief Valve	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD	NO	STD

Model 92-80-03 NEMA 56C Adapter	
#	Description
1	NEMA 56C Adapter
2	10 mm Washer
3	Screw 1 3/8-16x38 UNC



Model 91-81-11 NEMA 56C Coupling	
#	Description
1	Coupling w/5/8" Bore
2	M6 x 8 Set Screw
3	Spider
4	Coupling, Flat Side



CLARK

Series PO 4000 Stainless Steel Rotary Vane Pumps

Flow to 760 GPH, Pressure to 260 PSI

DESCRIPTION

The 4000 series rotary vane pumps are available in 7 different displacements from 325 to 740 GPH at 1450 rpm and are the latest edition of high technology volumetric pumps to our line. The pump housing, the rotor and every metallic component are AISI 303 stainless (AISI 316 is also available). The pumping chamber and the vanes are high impact carbon graphite. The self-lubricating property of polished stainless steel and carbon graphite makes this pump well suited for water and water based solutions.

Inlet and outlet ports are 1" NPT female threaded NBR or Viton seals available.

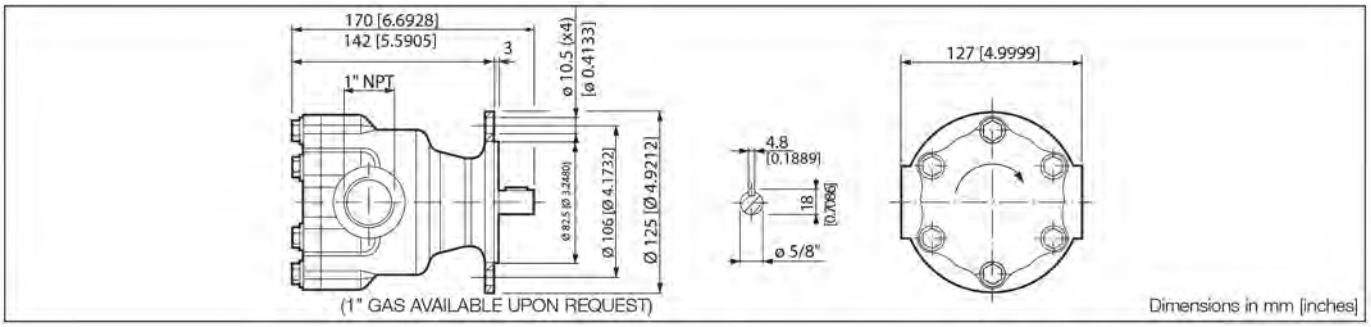
SPECIFICATIONS

Pump Housing: AISI 303 Stainless Steel
Pumping Chamber: Carbon Graphite
Ports: 1" NPT
Max Temperature : 70° C (158° F)
Seals: NBR (Viton upon request)
Max Motor Speed : 1725 rpm
Max System Pressure : 20 Bar (290 psi)
Mounting: NEMA 56C Adapter

TYPICAL APPLICATIONS

- Car Wash
- Irrigation
- Cooling Systems
- Reverse osmosis systems

DIMENSIONS (MM)



MOUNTING

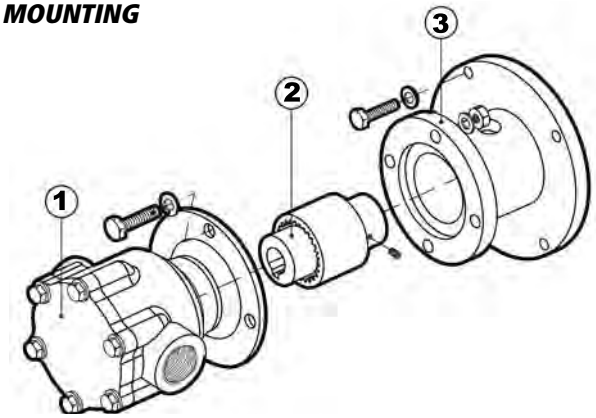


Table 1

#	P/N	Material	Description
1	Table 2	Stainless	Pump
2	211715	Cast Iron	NEMA 56C Coupling
3	211605	Aluminium	NEMA 56C-143TC-145TC Adapter With Screws

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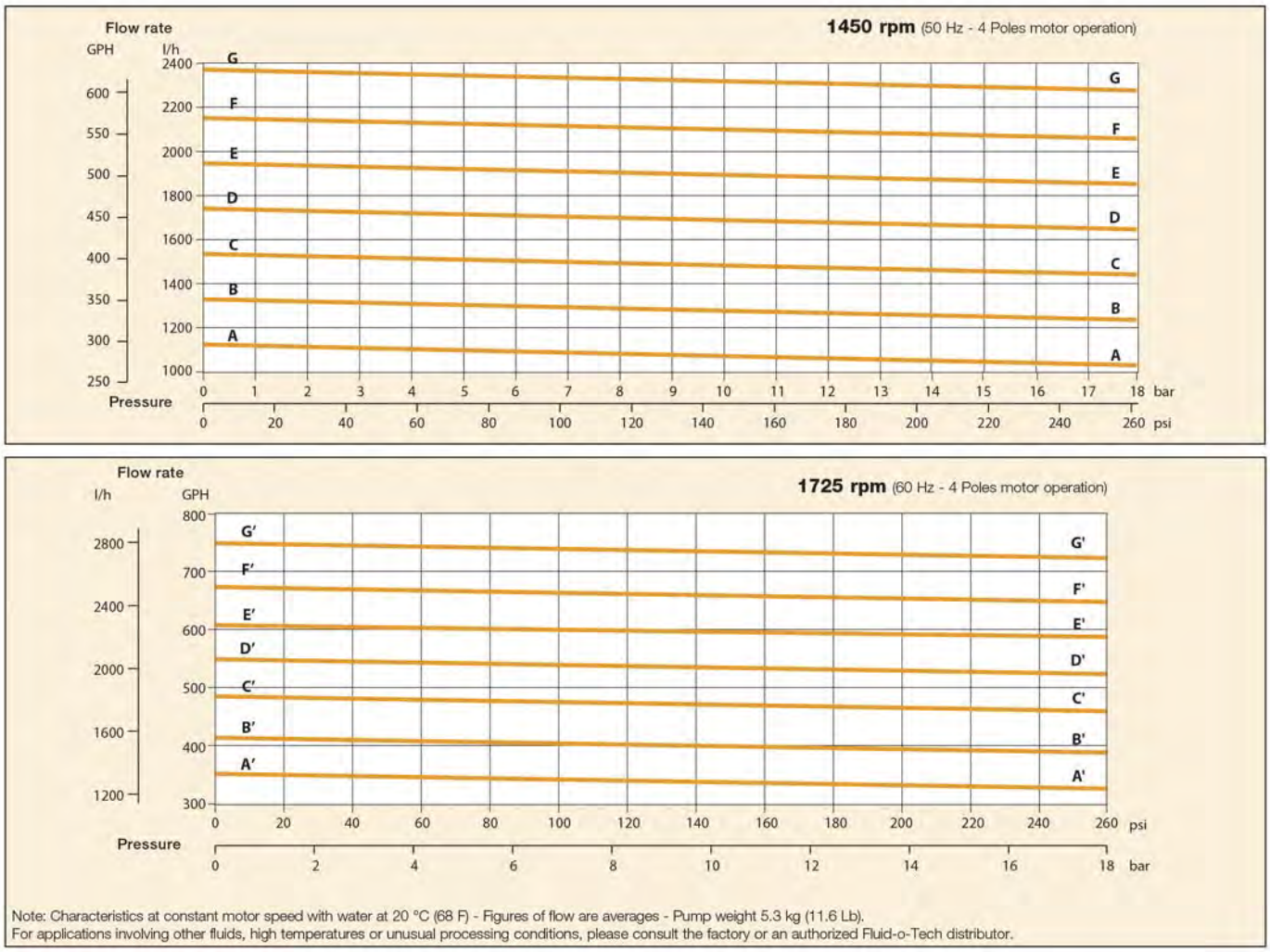
PUMP MODELS & FLOW CURVES



Note: Characteristics at constant motor speed with water at 20 °C (68 F) - Figures of flow are averages - Pump weight 5.3 kg (11.6 Lb).
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

Table 2

Model	PO4010	PO4020	PO4040	PO4060	PO4080	PO4100	PO4120
Flow Figure	A-A	B-B	C-C	D-D	E-E	F-F	G-G

MARCO

Series UP1 Impeller Pumps for Wastewater & Additives

Water to 11.9 GPM

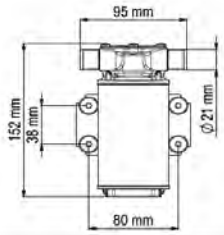
DESCRIPTION

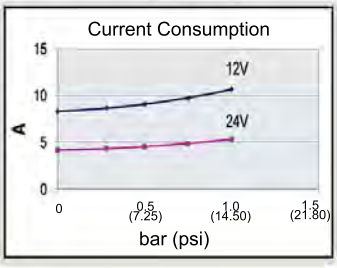
Model UP1 impeller pumps are self-priming, compact, powerful, 12 or 24 VDC electric pumps with flexible nitrile impeller.

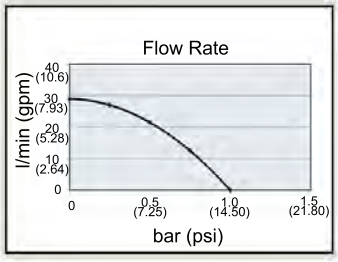
UP1 series pumps are available in 3 different flow rates: 7.4, 9.25 and 11.9 gpm.

Fitted with water proof cable guide and internal brush holder with EMI filter. ISO 8846 and ISO 8849. Ideal for engine additive pumping, wastewater transfer, bilge, and ballast tank pumping.

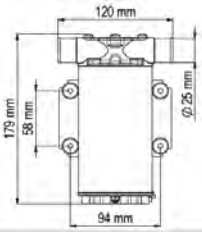
UP1-J

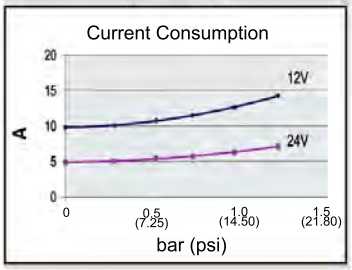


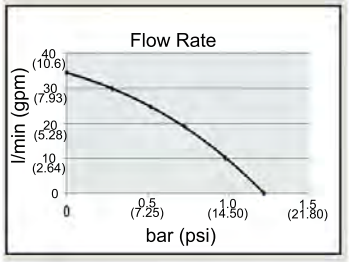




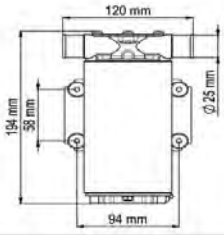
UP1-N

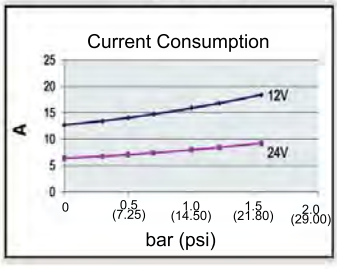


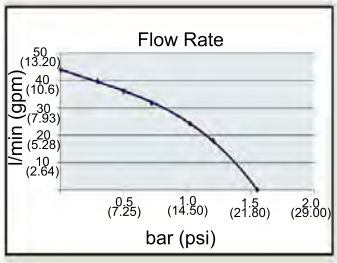




UP1-M







Model	Voltage	Manual Switch	Self-Prime meters (ft)	Max Press. bar (psi)	Max. Flow Rate	Fuse Amps	Ports
UP1-N-12V	12 VDC	-	1.5 (5)	1.2 (17.4)	35 (9.25)	8	3/8 " BSP 3/4" NPT Male
UP1-N-24V	24 VDC	-	1.5 (5)	1.2 (17.4)	35 (9.25)	4	
UP1-J-12V (N,S,RS)	12 VDC	N=None S= On/Off RS=On/Off/ Reversing	1.5 (5)	1 (14.5)	28 (7.4)	*10	1" BSP 1" NPT Male Adaptors Supplied
UP1-J-24V (N,S,RS)	24 VDC		1.5 (5)	1 (14.5)	28 (7.4)	*5	
UP1-M-12V)	12 VDC	-	1.5 (5)	1.5 (21.8)	45 (11.9)	14	
UP1-M-24V	24 VDC	-	1.5 (5)	1.5 (21.8)	45 (11.9)	7	
*Fuse is built-in on models supplied with manual switch							

Built-in Manual Switch Option
On/Off
On/Off/Reversing

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ZUWA

Series N2001 & U2001 Drill Driven Impeller Pumps

Aluminum or 316L SS, Flows to 60 LPM (15.9 GPM), Pressure to 4 Bar (58 PSI)

DESCRIPTION

The pump series N & U, manufactured in Germany, are driven with a drill. The shaft is fixed to the chuck of a regular regular electric or cordless drill equiped with a depth stop. The pump head is supplied with an adaptor that is secured to the drill depth stop rod to prevent the pump from spinning.

Series U is an aluminum housed multi-purpose pump designed for transferring clean or contaminated liquids. It is not suitable for handling abrasive or corrosive fluids.

Series N is a high quality 316L stainless steel pump with numerous applications in industrial plants and production facilities. It is the appropriate choice for transferring corrosive fluids.

PRINCIPAL OF OPERATION:

Flexible impeller pumps are displacement pumps. The rotor with flexible vanes is mounted concentrically in a circular housing which has a flattened area at one side. This provides the eccentric path for the impeller, thereby squeezing the flexible blades on this side.

A B C

A) The impeller rotation and the straightening of the vanes upon leaving the cam creates a vacuum on the suction side drawing the fluid into the pump chamber.

B) The rotating impeller transfers the liquid from the inlet to the outlet port of the pump.

C) The squeezing of the vanes against the cam causes pressure at the delivery side and the fluid is pressed out in continuous operation.

Impeller Materials	
NBR (Perbunan®, Buna-N®)	water, antifreeze, heat transfer fluid, vegetable oil, grease
EPDM (Keltan®, Buna EP®)	high tempreratures, for acids and bases
CR (Neoprene®, Bayprene®)	useful for food industry applications
FKM (Viton®, Fluorel®)	oil, diesel, fuel oil, palm oil, soy bean oil, oil emulsives
Plastics (60°C Max.)	mineral and vegetable oils, diesel fuel, heat transfer fluid

SPECIFICATIONS

Technical Data	Models			
	U2001-A	U2001-B	N2001-A	N2001-B
Pump Housing	Aluminum (AlMgSi1)	Aluminum (AlMgSi1)	316L SS	316L SS
Pump Shaft	316L SS	316L SS	316L SS	316L SS
Impeller	NBR, EPDM FKM, CR or Plastic			
Impeller Bushing	Polyamide	Polyamide	316 SS	316 SS
Flow	30 LPM (8 GPM)	60 LPM (16 GPM)	30 LPM	60 LPM
Max Pressure	4 Bar (58 PSI)			
Connections	3/4" NPTM	1" NPTM	3/4" NPTM	1" NPTM
Min. Drive Power	500 W	700W	500 W	700W
Max. RPM	2900			
Max. Temperature	90°C (194°F)			
Weight	0.6 kg	0.8 kg	1.5 kg	2 kg

Order Information	
Model	Description
U2001A-(N, E, C ,F ,P)	Aluminum Pump (NBR, EPDM, CR, FKM, Plastics Rotor)
U2001B-(N, E, C, F ,P)	Aluminum Pump (NBR, EPDM, CR, FKM, Plastics Rotor)
N2001A-(N, E, C, F, P)	316 SS Pump (NBR, EPDM, CR, FKM, Plastics Rotor)
N2001B-(N, E, C, F, P)	316 SS Pump (NBR, EPDM, CR, FKM, Plastics Rotor)
11012300	Pump Drill Adaptor (Not included with pump)

-Dry Self Priming: Impeller pumps are dry self priming from a depth of three meters. Pre-filling is required for a suction depth of three metres and more. The maximum suction depth is 7 metres. Pumps can run dry for 60 seconds.

-Pulsation Free

-Versatile: Useful for many different fluids and applications. Materials of impellers, seals and pump housings can be selected according to the individual needs

-Easy Maintenance: For cleaning and maintenance work the pumps are quickly and easily disassembled. Replacement parts can be ordered individually. Low operation costs!

Typical Applications	
Series U	Series N
filling solar collectors	clean tanks
irrigation	cleaning ponds
rain water harvesting	delivering
domestic water supply	filtering
decanting barrels	dosing
draining waste oil	decanting
sewerage disposal	draining
car wash	chemicals
tank draining	acids
cooling lubricants	bases

CLARK SOLUTIONS

NH-PX-D Series Inert Magnetic Pumps

DC Powered Sealless Magnetic Driven Pumps For Liquids

DESCRIPTION

The NH series pumps have an inert pump housing that is isolated from the pump motor. The pump is driven by a magnetic coupling. The pump shaft and bearings are made of wear resistant ceramic or SiC.

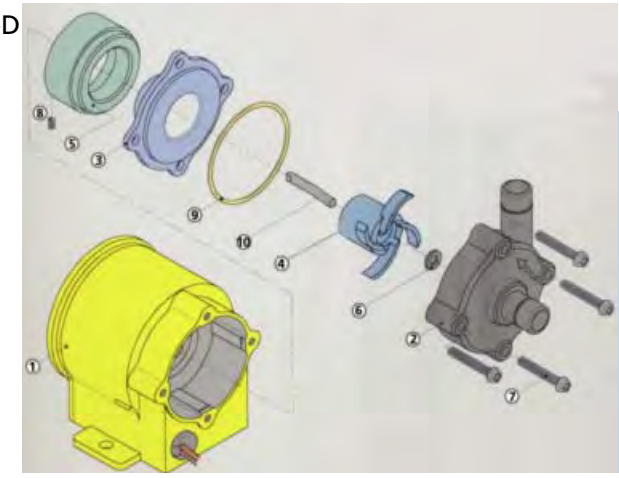
Bearing, shaft and thrust pad are molded into the plastic pump body to assure excellent alignment.

The NH series pump casing is offered in a choice of glass fiber filled polypropylene, PVDF and ETFE.

The pumps are maintenance free, compact in size and their operating efficiency greatly reduces heat radiation.

GENERAL

Power- 12 or 24Vdc, Models 5&10PX-D
24Vdc, Models 30,40,50PX-D
Oper. Temp- PX:0-70°C; PX-F:90°C;
PX-N:0-80°C; PX-Z:0-70°C
Casing Material-PVDF, Glass Filled Polypropylene, Carbon Filled ETFE
Rated Life- 10,000 hours
Motor Case- Aluminum
Motor Type- DC Brushless
Connections: Hose Barb or MNPT thread
Max. Pressure- 1.5 times maximum delivery pressure
Exceptions- Not suitable for slurries.



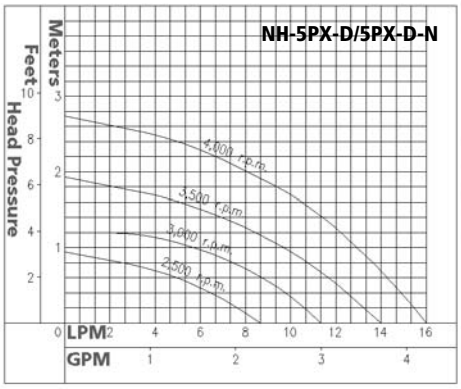
No.	Part
1	Motor
2	Front Casing
3	Rear Casing
4	Impeller
5	Magnet Housing
6	Front Thrust Pad
7	Bolt, Front Casing
8	Set Screw
9	O-Ring
10	Shaft

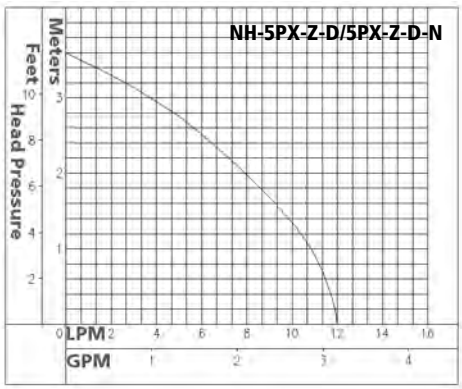
SPECIFICATIONS

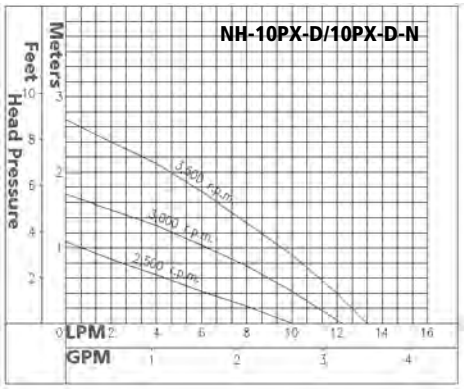
Model	Casing	Bearing	Thrust Pad	Shaft	O Ring	Tubing Conn.(mm)	Threaded MNPT	Speed (RPM)	Max Press.(m)-Flow(LPM)	Power Cons.
NH-5PX-D	PPG	-	PE	Ceramic	NBR,FKM,EPDM	14	1/2"	2500 3000 3500 4000	0.91-7.0 1.20-11.05 1.90-13.50 2.80-15.00	24Vdc/17w
NH-5PX-Z-D	PPG	-	PE	Ceramic	NBR,FKM,EPDM	14	1/2"	2500 3000 3500	1.50-7.50 2.20-10.00 2.80-11.50	24Vdc/17w
NH-10PX-D	PPG	-	PE	Ceramic	NBR,FKM,EPDM	14	1/2"	2500 3000 3500	1.20-8.00 1.60-11.50 2.50-14.00	24Vdc/17w
NH-30PX-D	PPG	Ceramic	PPS	Ceramic	NBR,FKM,EPDM	18	3/4"	2500	1.70-14.00	
NH-30PX-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	2.80-16.00	24Vdc/20w
NH-30PX-D-F	ETFE	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3500	3.60-18.60	
NH-40PX-D	PPG	Ceramic	PPS	Ceramic	NBR,FKM,EPDM	18	3/4"	2500	2.5-23.00	
NH-40PX-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	3.10-26.00	24Vdc/25w
NH-40PX-D-F	ETFE	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3500	4.80-30.00	
NH-50PX-Z-D	PPG	Ceramic	PPS	Ceramic	NBR,FKM,EPDM	18	3/4"	2500	2.30-11.00	
NH-50PX-Z-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	4.30-13.00	24Vdc/25w
NH-50PX-Z-D-F	ETFE	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3500	3.60-18.60	

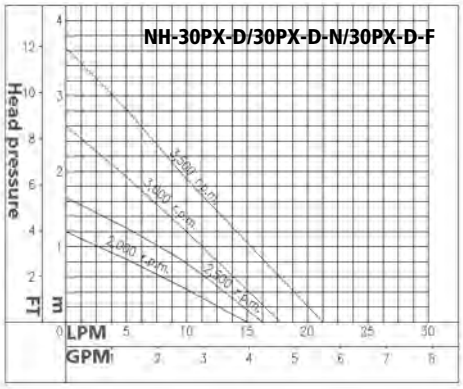
Ordering Note- Specify the voltage required when ordering. 12 Vdc or 24 Vdc for models 5PX & 10PX, 24Vdc for all other models.
*SiC is optionally available, consult factory

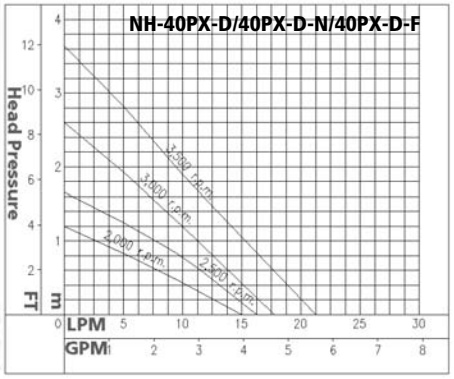
FLOW CURVES

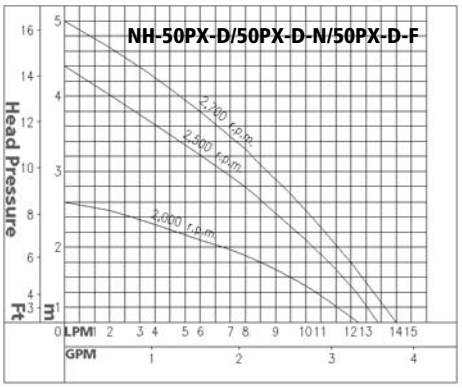




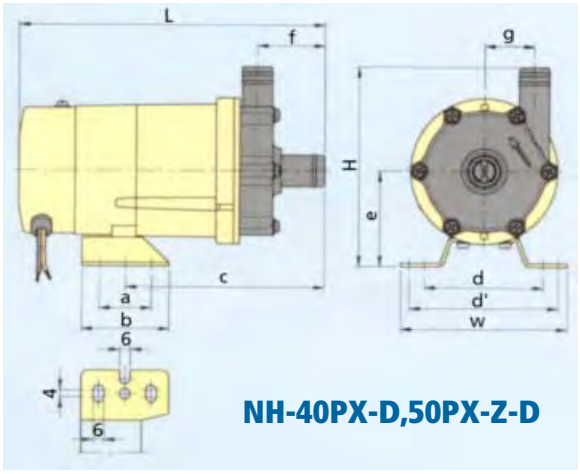


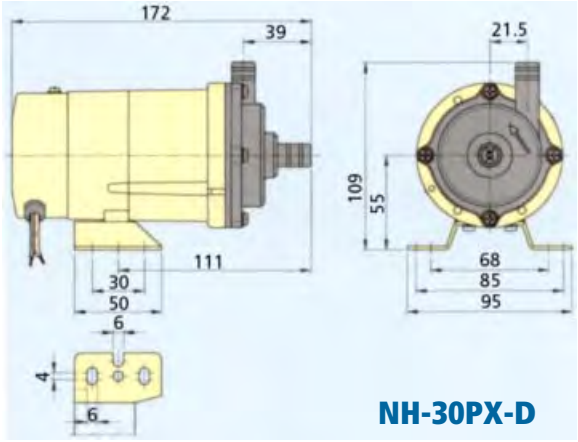






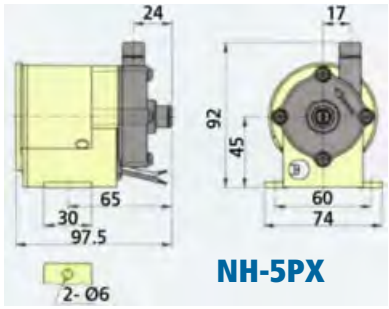
DIMENSIONS(MM)





	W	H	L	a	b	c	d	d'	e	f	g
40PX-D	95	115	*175	30	50	*113.5	68	85	55	*38.5	28.5
50PX-Z-D	95	125	190	30	50	129	68	85	55	39.5	38.5

*For hose barb connection, for NPT: L=170, c=108, f=33



TO ORDER:

1) Select Model Number from Table
2) Specify **H**ose Barb or **T**hreaded Connection
3) Specify O-ring material where a choice is offered
4) Specify Voltage (12V, 24V) per Table

EXAMPLE: NH-5PX-Z-D-T-FKM24V

Most Popular Models
NH-5PX-D-H-FKM24V
NH-10PX-D-H-FKM24V
NH-30PX-D-H-FKM24V
NH-40PX-D-H-FKM24V
NH-50PX-Z-D-H-FKM24V

CLARK SOLUTIONS

NH-PX- Series Inert Magnetic Pumps

AC Powered Sealless Magnetic Driven Pumps For Liquids

DESCRIPTION

The NH series pumps have an inert pump housing that is isolated from the pump motor. The pump is driven by a magnetic coupling. The pump shaft and bearings are made of wear resistant ceramic or SiC.

Bearing, shaft and thrust pad are molded into the plastic pump body to assure excellent alignment.

The NH series pump casing is offered in a choice of glass fiber filled polypropylene, PVDF and ETFE.

The pumps are maintenance free, compact in size and their operating efficiency greatly reduces heat radiation.

SPECIFICATIONS

Power- 110 Vac, single phase
Casing Materials- PPS, PVDF, Glass Filled Polypropylene
Carbon Filled ETFE
Oper. Temp: All 1PX:0-60°C; PX:0-70°C; PX-F:90°C;
PX-N:0-80°C; PX-Z:0-70°C
Connections: Hose barb or MNPT thread

Max. Pressure- 1.5 times maximum delivery pressure
Rated Life- 20,000 hours
Slurries- 5%, 50 micron (NH30,40,50 & 100 Only)
Motor Type- 110 Vac, 60Hz
Motor Case- Aluminum die cast
Magnet- Isotropic Ferrite

Nominal Speed- 3000 RPM

Model	Casing & Impeller	Bearing	Thrust Pad	Shaft	O Ring	Tubing Conn.(mm)	Threaded MNPT	Max Press(m)-Flow(lpm)	Reccomended Max Press(m)-Flow(lpm)	Max Power Cons.
NH-1PX	PPS	-	PPS	Ceramic	NBR, FKM	14	1/2"	1.2-8.0	0.8-4.5	18W
NH-1PX-Z	PPS&PPG	-	PPS	Ceramic	NBR, FKM	14	1/2"	2.8-7.0	1.5-4.3	21W
NH-3PX	PPS	-	PPS	Ceramic	NBR, FKM	14	1/2"	2.0-11.5	1.0-7.5	20W
NH-5px	PPG	-	PPS	Ceramic	NBR, FKM	14	1/2"	1.2-8.0	0.8-4.5	18W
NH-5PX-Z	PPG	-	PPS	*Ceramic	NBR, FKM	14	1/2"	2.8-7.0	1.5-4.3	21W
NH-10PX	PPG	-	PPS	Ceramic	NBR, FKM	14	1/2"	2.0-11.5	1.0-7.5	20W
NH-30PX	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	14	3/4"	3.1-18	1.5-13.0	30W
NH-30PX-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	14	3/4"	3.1-18	1.5-13.0	30W
NH-30PX-F	ETFE	Ceramic	Rulon™	*Ceramic	NBR, FKM	14	3/4"	3.1-18	1.5-13.0	30W
NH-40PX	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	18	3/4"	4.1-30	2.0-22.0	45W
NH-40PX-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	3/4"	4.1-30	2.0-22.0	45W
NH-40PX-F	ETFE	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	3/4"	4.1-30	2.0-22.0	45W
NH-50PX	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	20	3/4"	5.0-37	2.5-24.0	90W
NH-50PX-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	20	3/4"	5.0-37	2.5-24.0	90W
NH-50PX-X	PPG	Ceramic	Rulon™	*Ceramic	NBR, FKM	25	1.0"	4.0-70	2.0-40	80W
NH-50PX-X-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	25	1.0"	4.0-70	2.0-40	80W
NH-50PX-Z	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	18	1.0"	6.7-11	4.0-8	55W
NH-50PX-Z-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	1.0"	6.7-11	4.0-8	55W
NH-50PX-F	ETFE	Ceramic	Rulon™	*Ceramic	NBR, FKM	20	1.0"	4.0-70	2.0-40	80W
NH-50PX-X-F	ETFE	Ceramic	Rulon™	*Ceramic	NBR, FKM	25	1.0"	4.0-70	2.0-40	80W
NH-50PX-Z-F	ETFE	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	1.0"	6.7-11	4.0-8	55W
NH-100PX	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	20	3/4"	6.3-50	4.0-31	120W
NH-100PX-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	20	3/4"	6.3-50	4.0-31	120W
NH-100PX-X	PPG	Ceramic	Rulon™	*Ceramic	NBR, FKM	25	1.0"	4.0-80	2.0-30	165W
NH-100-PX-X-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	25	1.0"	4.0-80	2.0-30	165W
NH-100PX-Z	PPG	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	3/4"	11.0-18	6.0-13	95
NH-100PX-Z-N	PVDF	Ceramic	Rulon™	*Ceramic	NBR, FKM	18	3/4"	11.0-18	6.0-13	95

* SiC is also an available material, consult factory

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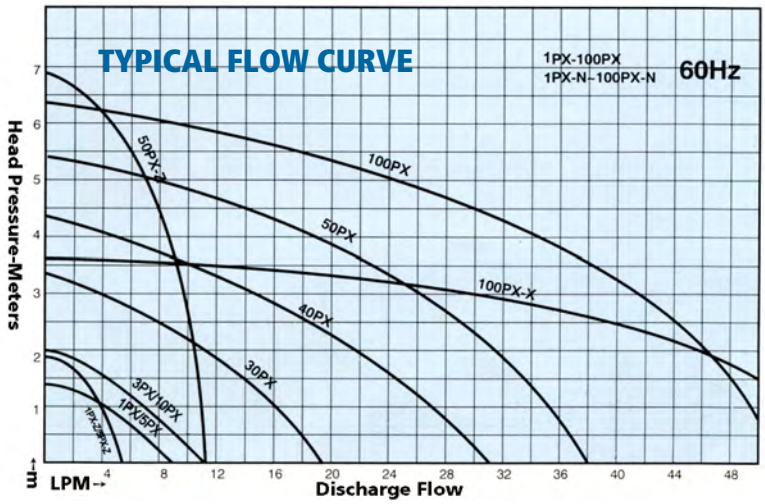
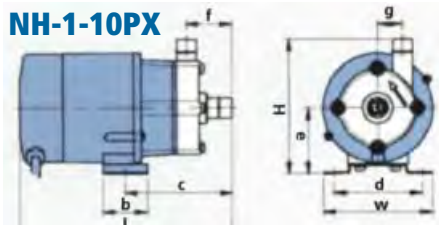


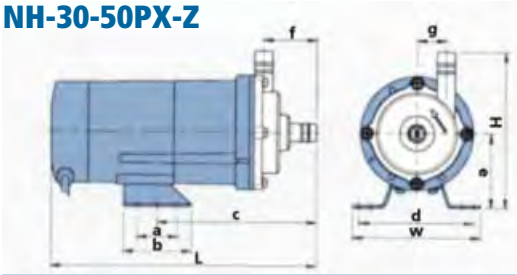
DIMENSIONS(MM)

NH-1-10PX



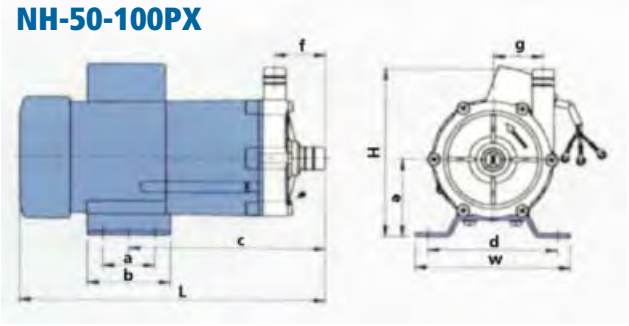
	W	H	L	b	c	d	e	f	g
1PX-3PX	70	92	101.5	30	70	60	45	28	17
5PZ-10PX	74	92	145	30	73	60	45	31	17

NH-30-50PX-Z



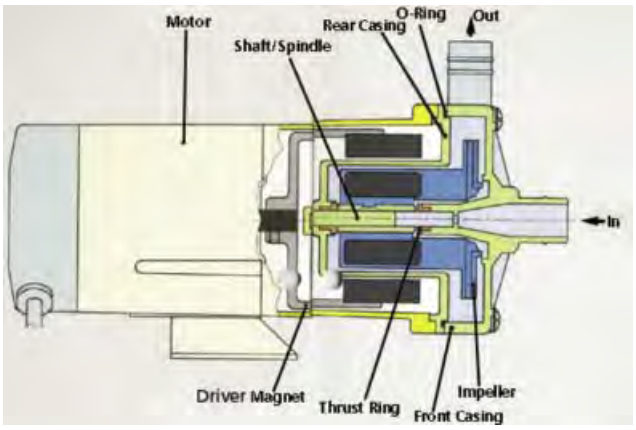
	W	H	L	a	b	c	d	e	f	g
30PX	95	115	197	30	50	117	85	55	39	21.5
40PX	95	115	210	30	50	131.5	68	55	38.5	28.5
50PX-Z	95	125	226	30	50	134	68	55	39.5	38.5

NH-50-100PX



	W	H	L	a	b	c	d	e	f	g
50PX	120	130	247	40	64	169	100	60	48	31
50PX-X	120	135	255	40	64	176.5	100	60	50	26
100PX-Z	120	130	236	40	64	152	100	60	39.5	38.5
100PX	120	130	262	40	64	169	100	60	48	31
100pX-X	120	135	270	40	64	176.5	100	60	50	26

CUTAWAY VIEW



TO ORDER:

1) Select Model Number from Table
2) Specify **H**ose Barb or **T**hreaded Connection
3) Specify O-ring Material Where A Choice Is Offered
4) Specify Voltage- 115V

EXAMPLE: NH-5PX-Z-T-FKM115V

Most Popular Models
NH-10PX-H-FKM115V
NH-30PX-T-FKM115V
NH-40PX-T-FKM115V
NH-50PX-T-FKM115V
NH-100PX-T-FKM115V

Notes:

1) Three-Phase motors available
2) 220 Vac motors available
3) Flange & union connections available
4) Refer to recommended max pressure and flow on specification chart for sizing of pump for application
5) Consult factory for alternate thrust pad/ring materials. Alternate materials available include PE, PPS, *Rulon™, & SiC

*** Rulon is a registered trademark of Dixon Industries Corporation**

PI-Z-D Magnet Drive Pump with Brushless DC Motor

Max Flows from 1.6 to 5.4 GPM, Discharge head up to 36 ft

FEATURES

Magnetic drive pump with a brushless DC motor
Rare earth magnets for strong performance in a compact package
Life expectancy of over 20,000 hours
Flow rates up to 5.4 GPM (20 L/min)
Discharge head up to 36 ft (11m)

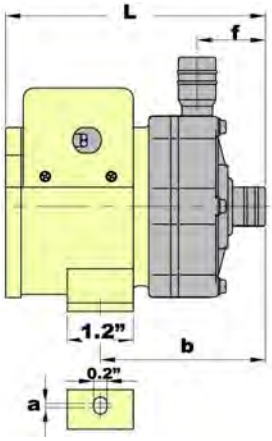
The Largest and Smallest PI-Z-D Options

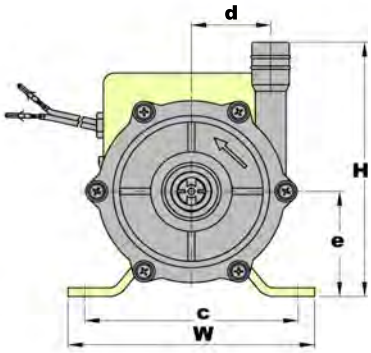
SPECIFICATIONS

Model	Barb Tube Fitting size Outlet x Inlet (inches)	Max flow (GPM)	Max head (ft)	Motor		
				Power (V)	Output x Input (W)	Speed (rpm)
NH-10PI-Z-D	5/16 x 9/16	2.2	29	DC24V	18 x 30	5500
NH-15PI-Z-D	5/16 x 11/16	2.2	29	DC24V	20 x 45	3200
NH-20PI-Z-D	11/16 x 11/16	4.2	27	DC24V	30 x 55	3000
NH-30PI-Z-D	11/16 x 11/16	5.4	36	DC24V	45 x 65	3300

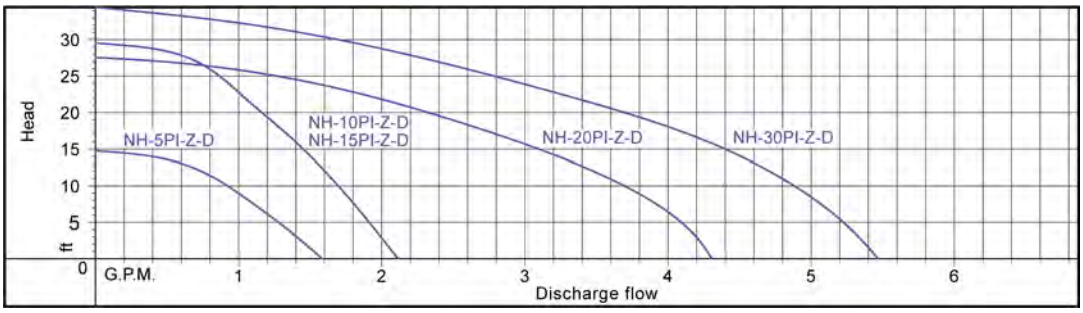
DIMENSIONS

Dimensions (Inches)									
Model	W	H	L	a	b	c	d	r	f
NH-5PI-Z-D	2.9	3.5	3.9	0	2.7	2.4	0.8	1.8	1
NH-10PI-Z-D	2.9	3.5	3.9	0	2.7	2.4	0.8	1.8	1
NH-15PI-Z-D	4.4	4.7	4.7	0.1	3	3.8	1.4	1.9	1.2
NH-20PI-Z-D	4.4	4.7	4.7	0.1	3	3.8	1.4	1.9	1.2
NH-30PI-Z-D	4.4	4.7	4.8	0.1	3	3.8	1.4	1.9	1.2





PUMP PERFORMANCE CURVE



ORDERING INFORMATION

SPECIFY MODEL FROM SPECIFICATION CHART

Example: NH-15PI-Z-D

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CLARK SOLUTIONS

Rotary Gear Pumps

Technical Bulletin: Pump Selection Information

GENERAL PUMP SELECTION

Applicable to the handling of all reasonably clean liquids, preferably having some lubricating value. Also suitable for handling nonlubricating liquids under limited conditions of operation with grease fittings or carbon bearings.

1. TYPE OF SERVICE

The majority of applications for Clark gear pumps fall into the following categories: (a) Transfer, (b) Lubrication, (c) Hydraulic, (d) Coolant and (e) General.

2. LIQUID TO BE HANDLED

Type:

Lubricating, corrosive, abrasive or caustic qualities of the liquid to be handled affect selection of pump type and size and its materials of construction. Specific gravity and viscosity at operating temperature determine speed and horsepower requirements.

Lubricity:

Rotary Gear pumps depend upon the liquid being circulated for lubrication of moving parts. However, the addition of grease fittings will frequently assist in the handling of non-lubricating liquids.

Temperature:

Operating temperature at the pump is an important factor affecting overall performance. Consideration should be given to any combination of ambient and liquid temperatures plus the heat rise resulting from resistance in the system that will affect the liquid viscosity. Generally, the lowest temperature to be encountered should be used to determine power requirements.

3. DELIVERY AND PRESSURE

Operating Characteristics:

Detailed characteristics over a wide range of operating conditions are given with Specifications and Operating Characteristics for specific pump types. Performance data is based on the specific viscosities given and ratings are for continuous duty. Pump capacities and performance other than those tabulated are available to meet a wide range of conditions.

Factors in Selection:

Determination of the required volume of liquid and operating pressure should include consideration of pipe sizes and pressure losses due to friction and height to which liquid must be raised.

4. SPEED

Recommended drive speeds meet standard operating speeds for electric motors and other driving mechanisms and are usually applicable for the majority of installations. Considerable variation in operating speed is possible to maintain high efficiency in the handling of a wide range of viscosities.

Horsepower:

Power requirements should be computed on the basis of highest liquid viscosity and system pressure. Generally, when power requirements fall between standard motor or engine ratings, the larger unit is selected for safety. (See Specifications and Operating Characteristics for type of pump to be used.)

PUMP SELECTION PROCEDURE

STEP 1 - Determine Delivery Required in Gallons Per Minute (GPM) and Pressure Required at the Work in Pounds Per Square Inch (PSI).

STEP 2 - Determine Pump Inlet Conditions Including Suction Pipe Size and Total Suction Head.

STEP 3 - Determine Pump Discharge Conditions Including Discharge Pipe Size and Total Head.

STEP 4 - Select the Pump and Determine Power Required.

STEP 1

Convert the quantity of liquid required to gpm and the amount of pressure required at the work to pounds per square inch (psi).

Conversion Factors

1 inch of mercury (Hg) equals 1.13 feet of water
15 inches of mercury (Hg) equals 17 feet of water
1 foot of water equals 0.433 pounds per square inch (PSI)
1 pound per square inch (PSI) equals 2.31 feet of water
17 feet of water or 15 inches of mercury equals 7.36 PSI

STEP 2

Vertical Lift: Vertical Lift is the amount of pressure required to lift the liquid from its lowest level to the centerline of the pump.

a) Measure the vertical distance between lowest liquid level and centerline of pump for Distance of Lift.
b) Distance of Lift (feet) x Specific Gravity of liquid x 0.433 equals Vertical Lift (PSI)

(A maximum Vertical Lift of 7.36 PSI or 15 inches of mercury is recommended for normal applications. Higher lifts are permissible with reduced volume. (Contact Clark for recommendations).

Suction Pipe Size

Having determined that Vertical Lift does not exceed 7.36 PSI, refer to Table 1, Recommended Suction Line Sizes, and select pipe size opposite nearest required delivery and viscosity.

To Find Total Suction Head

a) Measure entire length of suction pipe including fittings converted to equivalent feet of straight pipe. Refer to Table 2.
b) Refer to Table 4, Friction Loss Multipliers, and find the multiplier (M) opposite pipe size and liquid viscosity at delivery required.

Total Suction Head (PSI) equals (M x Total feet of suction pipe x Specific Gravity of liquid) plus or minus Vertical Lift (Add Vertical Lift when liquid level is below centerline of pump, and Subtract Vertical Lift when liquid level is above centerline of pump).

STEP 3

Assume a Discharge Pipe Size the same as Suction Pipe for calculating Friction Head. If smaller pipe is required, liquid velocity should not exceed 10 feet per second. Generally, a Discharge Pipe Size the same as Pump Outlet Connection will prove satisfactory.

Total Head

a) Find Static Head — (measure vertical distance between centerline of pump and highest point of discharge, equals Height of Lift). Static Head (PSI) equals Height of Lift x Spec. Gravity x 0.433

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(STEP 3 Continued)

b) Find Friction Head — measure entire length of discharge pipe including fittings (converted to equivalent feet of straight pipe) from pump discharge connection to point of discharge. (See Table 2 for equivalent Feet of Straight Pipe for Fittings). Add equivalent feet for valves and other accessories in discharge line to the foregoing.

Refer to Table 4, Friction Loss Multipliers, and find the multiplier (M) opposite pipe size and liquid viscosity at delivery required.

Table 1: Recommended Suction Line Sizes (when verticle lift does not exceed 7.36 psi or 15" Hg

GPM	Viscosity (SSU)								
	50	100	300	500	1000	1500	2000	5000	10.000
0.5	3/8	3/8	3/8	3/8	1/2	1/2	1/2	3/4	1
1	3/8	3/8	3/8	3/8	1/2	1/2	3/4	1	1
3	3/8	3/8	1/2	1/2	3/4	3/4	1	1 1/4	1 1/4
5	3/8	3/8	1/2	3/4	3/4	1	1	1 1/4	1 1/2
7	1/2	1/2	3/4	3/4	1	1	1	1 1/4	1 1/2
10	1/2	3/4	3/4	3/4	1	1 1/4	1 1/4	1 1/2	2
15	3/4	3/4	1	1	1 1/4	1 1/4	1 1/4	1 1/2	2
20	1	1	1	1	1 1/4	1 1/4	1 1/2	2	2
30	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	2	2 1/2
50	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	-	-		-
80	1 1/4	1 1/2	1 1/2	1 1/2	2	-	-		-

Table above represents best choice for optimum results. Smaller sizes can be used but with increased fluid velocity and the possibility of turbulence, noise and greater frictional resistance.

Table 2: Equivalent Feet of Straight Pipe for Fittings

	Pipe Sizes							
	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
45° Elbow	0.6	0.8	1.0	1.3	1.7	2.0	2.5	3.0
90° Elbow	1.3	1.6	2.2	2.8	3.7	4.4	5.2	6.4
Std Tee	2.7	3.3	4.5	5.7	7.6	9.2	11.5	14.0
Globe Valve open	13.0	17.0	21.0	28.0	37.0	43.0	54.0	65.0
Gate Valve open	0.27	0.35	0.45	0.6	0.8	0.95	1.3	1.4
1/4 Closed	1.5	2.0	2.7	3.5	4.5	5.5	7.0	8.0
1/2 Closed	6.0	10.0	14.0	17.5	22.0	26.0	33.0	40.0
3/4 Closed	35.0	43.0	57.0	75.0	103.0	125.0	150.0	175.0

Table 3: GPM at One Foot per Second Velocity

Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2
GPM	0.18	0.32	0.60	0.95	1.66	2.69	4.65	6.35	10.5	14.9

Data above is based on average piping conditions and is for approximate use only.

Friction Head (PSI) equals M x Spec. Gravity x Total length of Discharge pipe.

STEP 4

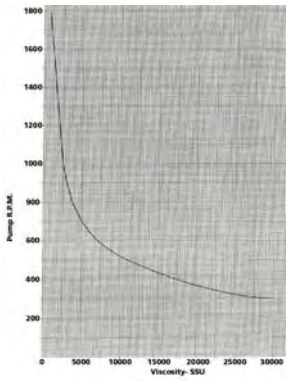
Select Pump from Specifications and Operating Characteristics by determining which preliminary selection will meet requirements most efficiently. Power required is determined from Tabulated Power Requirements shown with Operating Characteristics and corrected for liquid viscosity

Table 4: Friction Loss Multipliers

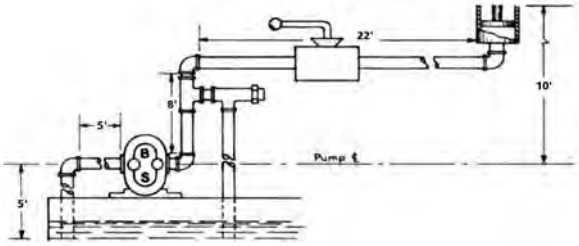
Del. GPM	Pipe Size (inches	Viscosity (SSU)							
		32	50	100	150	200	300	500	*1000
0.5	3/8	0.012	0.025	0.10	0.15	0.20	0.30	0.49	0.95
	1/2	0.004	0.009	0.02	0.03	0.04	0.06	0.10	0.20
	3/4	0.0005	0.001	0.006	0.009	0.013	0.02	0.04	0.08
	1	0.0003	0.0009	0.002	0.004	0.006	0.010	0.019	0.04
	1 1/4	0.0001	0.0004	0.001	0.0015	0.002	0.003	0.005	0.01
1	3/8	0.019	0.040	0.12	0.17	0.23	0.34	0.55	1.1
	1/2	0.006	0.015	0.04	0.06	0.08	0.11	0.21	0.41
	3/4	0.002	0.005	0.01	0.02	0.03	0.04	0.07	0.15
	1	0.001	0.002	0.005	0.007	0.01	0.015	0.025	0.06
	1 1/4	0.0002	0.0007	0.002	0.003	0.0035	0.005	0.009	0.02
5	3/8	0.30	0.51	0.52	0.77	1.0	1.6	2.7	5.4
	1/2	0.10	0.16	0.20	0.30	0.40	0.60	1.1	2.2
	3/4	0.025	0.045	0.07	0.11	0.15	0.21	0.35	0.70
	1	0.008	0.01	0.025	0.035	0.05	0.08	0.13	0.26
	1 1/4	0.002	0.003	0.01	0.015	0.02	0.03	0.05	0.10
10	1/2	0.45	0.60	0.85	1.0	1.15	1.5	2.1	4.4
	3/4	0.09	0.13	0.18	0.24	0.30	0.41	0.70	1.5
	1	0.03	0.04	0.05	0.07	0.10	0.15	0.25	0.50
	1 1/4	0.008	0.014	0.019	0.027	0.035	0.05	0.09	0.18
	1 1/2	0.003	0.006	0.009	0.015	0.02	0.03	0.05	0.10
15	3/4	0.18	0.30	0.40	0.49	0.58	0.75	1.08	2.2
	1	0.06	0.10	0.12	0.135	0.15	0.22	0.40	0.80
	1 1/4	0.016	0.026	0.032	0.045	0.05	0.08	0.14	0.27
	1 1/2	0.005	0.013	0.014	0.023	0.03	0.04	0.07	0.15
	2	0.002	0.003	0.005	0.008	0.01	0.015	0.03	0.05
20	1	0.05	0.15	0.20	0.205	0.21	0.30	0.50	1.1
	1 1/4	0.026	0.04	0.06	0.065	0.07	0.10	0.18	0.35
	1 1/2	0.012	0.021	0.025	0.032	0.04	0.06	0.10	0.20
	2	0.003	0.006	0.007	0.010	0.015	0.02	0.035	0.07
	2 1/2	0.001	0.002	0.003	0.005	0.007	0.011	0.018	0.036
30	1 1/4	0.06	0.10	0.12	0.135	0.15	0.18	0.26	0.52
	1 1/2	0.026	0.04	0.05	0.055	0.06	0.08	0.15	0.30
	2	0.007	0.013	0.016	0.018	0.02	0.03	0.05	0.10
	2 1/2	0.003	0.005	0.007	0.009	0.01	0.15	0.025	0.05
50	1 1/4	0.15	0.23	0.30	0.33	0.35	0.41	0.45	0.90
	1 1/2	0.06	0.10	0.13	0.135	0.14	0.14	0.23	0.46
	2	0.019	0.03	0.04	0.04	0.045	0.05	0.09	0.18
	2 1/2	0.008	0.013	0.017	0.0175	0.018	0.03	0.046	0.08
80	1 1/4	0.45	0.66	0.85	0.95	1.0	1.2	1.3	2.5
	1 1/2	0.18	0.30	0.35	0.36	0.40	0.42	0.50	1.0
	2	0.06	0.09	0.11	0.12	0.13	0.14	0.25	0.50
	2 1/2	0.02	0.04	0.04	0.04	0.045	0.045	0.06	0.13

*Multipliers for higher viscosities are proportional, e.g. 2000 SSU for 0.5 GPM, 3/8" pipe is 1.9, 10,000 is 9.5, etc. Multipliers are based on use of steel pipe, schedule 40 or smooth bore rubber

Recommended Max Speed vs Max Viscosity



TYPICAL HYDRAULIC APPLICATION



PROBLEM:

Required: a pump to operate a hydraulic cylinder using a clean light hydraulic oil of 100 SSU viscosity at operating temperature of 120°F with a specific gravity of 0.9.

Step 1 —

CYLINDER REQUIREMENTS: 5 inch diameter; 19.64 square inches cylinder area; 20 inch stroke; 1.7 gallons displacement; travel 60 inches per minute (20 seconds per stroke); 11,500 pounds load; requires 5.17 GPM, 585 PSI.

Step 2 —

PUMP INLET CONDITIONS:

Vertical Lift = Distance of Lift (5) x Spec. Gravity (0.9) x 0.433 = 1.9 PSI

Suction Pipe = 3/8 for 100 SSU at 5 GPM (Table 1)

Total Length of Suction Pipe = 10 feet plus 1.3 feet equivalent straight pipe for 90° elbow (from Table 2) = 11.3 feet

Friction Loss Multiplier for 3/8 pipe and 100 SSU at 5 GPM (from Table 4), M=0.52

Total Suction Head= M (0.52) x Total Length of Pipe (11.3) x Specific Gravity (0.9) plus Vertical Lift (1.9 PSI) = 7.2 PSI

Step 3 —

PUMP DISCHARGE CONDITIONS

Discharge Pipe Size = 3/8 "

Static Head = Vertical distance between pump and cylinder (10) x 0.433 x Specific Gravity (0.9)= 3.9 PSI.

Friction Head = Total Length of Straight pipe (30) plus 3-90° 3/8 elbows (3.9) plus estimated straight pipe for throw valve (1) or 34.9 x M (0.52) x Spec. Gravity(0.9) = 16.3 PSI

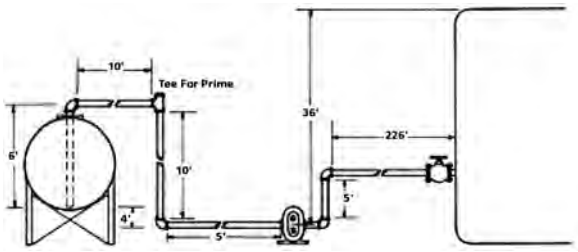
TYPICAL HYDRAULIC APPLICATION CONT'D

Total Head = Friction head (16.3 PSI) plus Total Suction Head (7.2 PSI) plus Working Pressure Required (585 PSI)= 608.5 PSI

Step 4 — PUMP SELECTION

Requires 5.17 GPM and 610 PSI. We find that Models 507 and 511 are satisfactory for Hydraulic Service, and are rated for 1000 PSI service while discharge at 0 PSI is sufficient to meet requirements. From Performance Data for these pumps, we find the #507 delivers 5.8 GPM at 610 PSI and requires 2.9 horsepower at 1725 RPM. (Capacity at 1140 RPM is insufficient to meet requirements). #511 delivers 5.1 GPM at 610 PSI and requires 2.9 horsepower at 1140 RPM. Select Pump #511 at lower speeds for long-life service. Select #507 at 1725 RPM for lower first cost.

TYPICAL TRANSFER APPLICATION



PROBLEM:

To deliver oil at 20 barrels per hour from a storage tank to a treater tank, using 1 1/2" new iron pipe. Assume viscosity of 300 SSU. Specific Gravity is 0.88

Step 1 —

CAPACITY REQUIRED: 20 bbls. per hr x 42 gals. per bbl. ÷ 60=14 GPM

Step 2 —

PUMP INLET CONDITIONS:

Find Total Suction Head Suction Pipe Size is given as 1 1/2"

Vertical Lift = Distance of Lift (4) x Spec. Gravity (0.88) x 0.433 = 1.52 PSI. In this case, Vertical Lift is a positive factor since the bottom of the tank is higher than the pump inlet). Friction Loss Multiplier (M) for 1 1/2 pipe at 15 GPM for 300 SSU viscosity is 0.04 (from Table 3. Suction = M (0.04) x 31 (total length of pipe plus 18' equivalent straight pipe for 2-90° elbows and 1-Tee) x Specific Gravity (0.88) = 1.7 PSI

Total Suction Head = 1.7 minus Vertical Lift (1.5)= 0.2 PSI

Step 3 —

PUMP DISCHARGE CONDITIONS:

Find Total Head Discharge Pipe Size is given as 1 1/2"

Static Head = 36" maximum height of lift x 0.88 Specific Gravity x 0.433 = 13.7 PSI

Friction Loss Multiplier (M) for 1 1/2" pipe at 15 GPM and 300 SSU is 0.04 (from Table 4).

(TYPICAL TRANSFER APPLICATION CONT'D)

Friction Head = M (0.04) x 231 (Total Length of Discharge Pipe, plus 2-90° elbows (8.8') plus 0.95 equiv. for gate valve normally open) x 0.88 Spec. Gravity = 8.5 PSI

Total Head = Static head (13.7 PSI) plus Friction Head (8.5 PSI) plus Suction Head (0.2 PSI) = 22.4 PSI

STEP 4 —

PUMP SELECTION

Required is 14 GPM and 22.4 PSI We find that Rotary Gear Pumps Nos. 3, 3S,13, 23, 53 and 525 all nominally meet requirements. In checking Performance Data for these pumps we can eliminate #13 which is reversible and has approx. the same capacity as #3 and #23 which is of bronze construction. Pump #3 delivers 17.0 GPM at 50 PSI and 900 RPM and requires 0.83 HP. Pump #3S delivers 16.1 GPM at 50 PSI and 1725 RPM requires 1.4 HP. Pump #53 delivers 14.9 GPM at 50 PSI and1140 RPM and requires 0.8 HP . Pump #525 delivers 16.3 GPM at 50 PSI and 1140 RPM and requires 1.0 HP. While any of these pumps is capable of performing the job satisfactorily, #53 requires the least amount of power and operates at a standard motor speed.

TROUBLESHOOTING TIPS

Not delivering fluid properly?	
• Pump may be driven in the wrong direction of rotation -	• Stop immediately to prevent seizure. Check direction of drive rotation (proper rotation direction is indicated by arrow on the head).
• Drive shaft broken, or shaft key sheared (direct drive) -	• Remove pump from mounting and determine internal damage. Replace parts if necessary.
• Intake pipe from reservoir blocked or viscosity too heavy to prime -	• Drain system. Add clean fluid of proper viscosity and specifications. Filter as recommended. Check system filter for cleanliness.
• Intake air leaks (foam in oil) -	• Check intake connections. Tighten securely. Squirt oil around seal. If foam in discharge line stops, seal is leaking and must be replaced.
• Pump not priming -	• Loosen connection in outlet line. Bleed air until fluid flows. Check direction of rotation and suction conditions. Check for air leaks as above.
• Fluid level too low -	• Reservoir fluid level must be above the opening of the intake pipe. (The system should always be checked at initial start-up to make certain it is filled with fluid).
System pressure too low?	
• Relief valve set too low -	• Adjust the relief valve, check setting with a pressure gage.
• Worn pump parts causing extreme internal leakage -	• Replace gears and take required corrective steps
• Partly clogged intake strainer or restricted intake pipe -	• Pump must receive intake fluid freely or cavitation results. Drain system, clean the intake pipe, and clean or replace the strainer. Add new fluid and strain by recommended procedures.
• Defective bearing -	• Replace cap or head as required (bearings available only as assembled in cap and head). Inspect the shafts and replace if necessary.
• Air leak at pump intake pipe joints or shaft seal -	• Pour fluid on joints and around the drive shaft seal while listening for a change in sound.Tighten joints as required. Replace the shaft seal if necessary.
• Drive speed too fast or too slow -	• Drive pump within its recommended speed range.
• Drive shaft misalignment -	• Check the bearings and seal. Replace pump if necessary and realign the shafts. Always check before start up. Shaft must not be out of line more than 0.002 with the power source shaft. Shaft ends should have a gap of 1/8 minimum.
Shaft seal leaking?	
• Seal worn or damaged -	• Replace seals
• Excessive pressure on seals -	• Check for restriction or blockage of internal backdrain to the seal of the pump head. Inlet pressure should not exceed 5 PSI. Make certain that the hole through the drive shaft is clear.
Housing leaking?	
• Pipe fitting too tight -	• Check pump cap for warping. Inspect cap, housing and head for flatness and replace as necessary
• Dirt in joints, housing scored -	• Clean cap, housing and head. Carefully remove scoring by lightly Tapping or stoning
Excessive heat?	
• Discharge or pump temperature -	• When over 160°F or hot in comparison with circuit lines, pump should be shut down immediately. Inspect for excessive wear or bearing failure. Before restarting, insure that fluid cooling capacity is adequate to remove system generated heat.
Rapid wear?	• Inspect fluid for grit and dirt. Check pipe fittings; over tightening will warp cap and cause premature wear.

Rotary Gear Pumps

Technical Bulletin: Gear Pump Material Compatibility, Viscosity Conversion

The materials listed for use in the construction of pumps for different liquids are for general application only. In the selection of materials consideration should be given to general practice and the experience of the user in handling the liquids. In handling food, medicinal and similar products consideration must be given, also to laws and regulations in force at the locality where the pump is to be used.

Liquid	Conditions	Chemical Symbol	Materials Permissible
Acid, Acetic		CH_3COOH	All Bronze, Monel, Stainless Steel
Acid, Arsenic (Arsenic Penta-oxide)		AS_2O_4	All Iron, Stainless Steel
Acid, Carbolic		C_4H_5OH	All Iron
Acid, Carbolic in H2O	Dil.		Standard Fitted
Acid, Cabonic in H2O	Aqueous Sol.	CO_2H_2O	All Bronze
Acid, Hydrocyanic	Conc. (M.P. 105¡F)	HCN	All Iron
Acid, Pyroligneous		CH_3CO_3H	All Bronze, Stainless Steel
Acid, Sulphuric, 93%	PH<4-5	H_3SO_4	All Iron, Stainless Steel
Acid, Tannic (m-Digallic acid)		$C_{44}H_{16}O_9$	All Bronze, Monel, Stainless Steel
Acetone		CH_5COCH_3	All Iron
Alcohol, Grain (Ethanol)		CH_3CH_3OH	All Bronze
Alcohol, Wood (Methanol)		CH_3OH	All Bronze
Ammonia, Aqua		NH_4OH	All Iron
Ammonium Bicarbonate		NH_4HCO_3	All Iron
Ammonium Chloride		NH_4Cl	All Iron, Stainless Steel
Ammonium Nitrate		NH_4NO_3	All Iron, Stainless Steel
Ammonium Orthophosphate	Aqueous Sol.	$(NH_4)_3HPO_4$	All Iron, Stainless Steel
Ammonium Sulfate	Aqueous Sol.	$(NH_4)_2SO_4$	All Iron, Stainless Steel
Aniline	Aqueous Sol.	$C_4H_3NH_2$	All Iron
Asphaltum	Aqueous Sol.		Stanard Fitted
Barium Chloride	Aqueous Sol.	$BaCl_3$	All Iron, Stainless Steel
Barium Nitrate		$Ba(NO_3)^2$	All Iron, Stainless Steel
Beer	Hot		All Bronze, Stainless Steel
Beer Wort			All Bronze, Stainless Steel
Beet Juice (thin)			All Bronze, Stainless Steel
Benzene (Benzol)		C_4H_4	All Iron
Bitterwasser		$CaCl_3$	All Bronze, Stainless Steel
Brine, Calcium Chloride	Aqueous Sol.		All Iron
Brine, Sodium Chloride	3% Salt		All Iron, All Bronze, Stainless Steel
Brine, Sodium Chloride	Over 3%		All Bronze, Monel, Stainless Steel
Brine, Sea Water			All Iron, All Bronze, Stainless Steel
Cachaza			Standard Fitted
Calcium Hypochlorite		$Ca(OCl)_8$	All Iron, Stainless Steel
Calcium Magnesium Chloride			All Bronze
Cane Juice			Standard Fitted
Carbon Bisulfide		CS_2	All Iron
Carbonate of Soda	(See Soda Ash)		
Carbon Tetrachloride		CCl_4	All Iron
Caustic Potash	(See Potassium Hydroxide)		
Caustic Soda	(See Sodium Hydroxide)		
Chloride of Lime	(See Calcium Hypochlorite)		
Chlorobenzene		C_4H_3Cl	Standard Fitted, Stainless Steel
Copperas (Green Vitriol)	(See Ferrous Sulphate)		All Iron
Creosote			All Iron
Cresol, Meta		$CH_3C_4H_4OH$	All Iron
Cyanide	(See Sod, Cyanide & Pot. Cyanide)		All Iron
Cyanogen	In Water	C_2N_2 (gas)	All Iron
Diphenyl	In Alcohol	$C_4H_5C_4H_5$	All Iron, Stainless Steel
Ethyl Acetate		$CH_3COOC_2H_3$	All Iron
Ferrous Sulphate		$FeSO_4$	All Iron, Stainless Steel
Furfural		C_4H_3OCHO	Standard Fitted
Gasolene			Standard Fitted
Glaubers Salt	(See Sodium Sulfate)		Standard Fitted
Glue	Hot		All Bronze, Stainless Steel
Glycerol (Glycerin)			Standard Fitted
Heptane		$CH_2(CH_2)_3CH_3$	All Iron, Stainless Steel
Hydrogen Peroxide	Com'l	H_2O_2	All Iron
Lard	Hot		All Iron
Lead, Molten			All Iron
Lime Water (Milk of Lime)		$Ca(OH)_3$	All Iron, Stainless Steel
Lye, Caustic	(See Potassium & Sod. Hydroxide)		
Magnesium Sulfate (Epsom Salts)	Aqueous Sol.	$Mg\ SO_4$	All Bronze, Stainless Steel
Magma (thick residue)			All Bronze, Stainless Steel
Magnesium Chloride	Aqueous Sol.	$MnCl_2$	All Iron, All Bronze, Stainless Steel
Manganese Sulfate	Aqueous Sol.	$MnSO_4$	All Bronze, Stainless Steel
Mash			All Iron
Methyl Chloride		CH_3Cl	All Iron, Stainless Steel
Methylene Chloride		CH_3Cl_3	
Milk of Lime	(See Lime Water)		All Bronze Stainless Steel
Mine Water			Standard Fitted
Molasses			Standard Fitted
Naphtha			

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Liquid	Conditions	Chemical Symbol	Materials Permissible
Nitre	(See Potassium Nitrate)		
Oil, Crude (Asphalt Base)	Hot		Standard Fitted
Oil, Crude (Paraffin Base)			Standard Fitted
Oil, Fuel			Standard Fitted
Oil, Kerosene			Standard Fitted
Oil, Lubricating (Lt. Or Hy.)			Standard Fitted
Oil, Mineral			Standard Fitted
Oil, Vegetable			All Iron
Oil, Purifying			All Iron
Oil, Coal Tar			All Iron
Oil, Creosote			All Iron
Oil, Turpentine			All Iron
Oil. Linseed			All Iron, Stainless Steel, Monel
Oil, Rapeseed			All Bronze, Stainless Steel, Monel
Paraffin	Hot		Standard Fitted
Peroxide or Hydrogen	(See Hydrogen Peroxide)		
Petroleum Ether	(See Benzene)		
Phenol	(See Carbolic Acid)		
Potash	(See Potassium Carbonate)		
Potassium Bichromate	Aqueous Sol.	K_3Cr_3O1	All Iron
Potassium Carbonate	Aqueous Sol.	K_3CO_3	All Iron
Potassium Chlorate	Aqueous Sol.	$KclO_8$	All Iron, Stainless Steel
Potassium Chloride	Aqueous Sol.	KCl	All Bronze, Stainless Steel
Potassium Cyanide	Aqueous Sol.	KCN	All Iron
Potassium Hydroxide	Aqueous Sol.	KOH	All Iron, Stainless Steel
Potassium Nitrate	Aqueous Sol.	KNO_3	All Iron, Stainless Steel
Potassium Sulfate	Aqueous Sol.	K_3SO_4	All Iron, All Bronze, Stainless Steel
Pyridine			All Iron
Salammoniac			
Salt Cake	Aqueous Sol.	Na_2SO_4+IMPURITIES	All Iron, All Bronze, Stainless Steel
Salt Water	(See Brines)		
Sea Water	(See Brines)		
Sewage			Standard Fitted
Slop, Brewery			Standard Fitted
Soap Liquor	Thin		All Iron
Soda, Ash (Sodium Carbonate)	Aqueous Sol.	Na_3CO_3	All Iron
Sodium Bicarbonate		$NaHCO_3$	All Iron, Stainless Steel
Sodium Chloride	(See Brines)		
Sodium Cyanide	Aqueous Sol.	Na CN	All Iron, Stainless Steel
Sodium Hydroxide	Aqueous Sol.	NaOH	All Iron, Stainless Steel
Sodium Nitrate	Aqueous Sol.	$NaNO_3$	All Iron, Stainless Steel
Sodium Sulfate	Aqueous Sol.	Na_2SO_4	All Iron
Sodium Sulfide	Aqueous Sol.	Na_3S	All Iron, All Bronze, Stainless Steel
Sodium Sulfite	Aqueous Sol.	Na_2SO_3	All Bronze, Stainless Steel
Starch	Aqueous Sol.		Standard Fitted
Stronfium Nitrate		$Sr\ (NO_3)_3$	All Iron, Stainless Steel
Sugar			All Bronze
Sulfur	In Water	S	All Iron, All Bronze
Sulfer Chloride	Cold	S_3Cl_2	All Iron
Syrup			All Bronze
Tanning Liquors (veg.)			All Bronze, Stainless Steel
Tar			All Iron
Tar and Ammonia	Aqueous Sol.		All Iron
Tetraethyl Lead		$Pb\ (C_2H_3)_4$	All Iron
Toluene (toluol)		$C_4H_3CH_2$	All Iron, Standard Fitted
Trichloroethylene		$CHCl:CCl_2$	All Iron
Varnish			All Bronze, Monel
Vinegar			All Bronze, Stainless Steel
Vitriol, Oil of	(See Acid, Sulfuric)		
Vitriol, White	(See Zinc Sulfate)		
Water (Fresh)			All Bronze
Water (Distilled)			All Bronze
Whiskey			All Bronze
Wine			All Bronze
Wood Pulp	Not Digested		All Bronze
Wood Vinegar	(See Pyroligenous Acid)		
Wort			All Bronze
Yeast			All Bronze
Zinc Sulfate	Aqueous Sol.	$ZnSO_4$	All Bronze, Stainless Steel

Clark Gear Pumps:

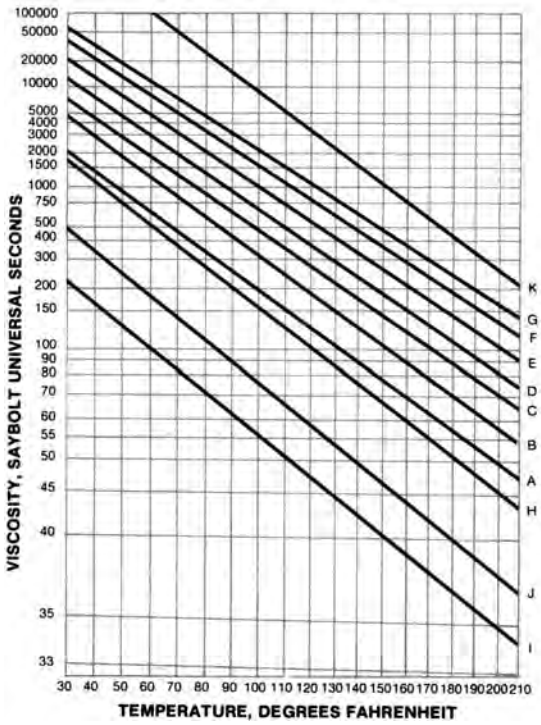
All Iron pumps are constructed with steel gears, iron casings, and iron bearings.

All Bronze pumps are constructed of bronze casings with bronze gears and shafts. For some applications the shafts of these pumps may be stainless steel.

Standard Fitted pumps are similar to All Iron pumps. If necessary, bronze or carbon bearings may be used instead of iron bearings.

Stainless Steel pumps are constructed of 316 stainless steel casings with 17-4 stainless steel gears and shafts.

Viscosities of Oils



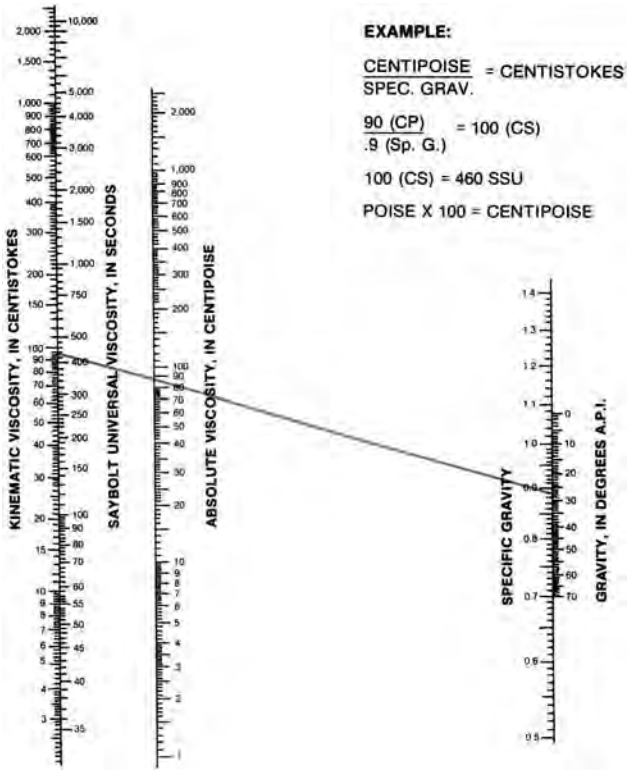
A.....S.A.E. #10 OIL
B.....S.A.E. #20 OIL
C.....S.A.E. #30 OIL
D.....S.A.E. #40 OIL
E.....S.A.E. #50 OIL
F.....S.A.E. #60 OIL
G.....S.A.E. #70 OIL
H.....D.T.E. Light Hydraulic Oil
I.....#2 Fuel Oil
(Maximum Viscosity)
J.....#4 Fuel Oil
(Maximum Viscosity)
K.....#6 Fuel Oil
(Maximum Viscosity)

Curves for S.A.E. numbered oils show average viscosities based on Dean and Davis viscosity index of 100.

Curves for fuel oil are based on oils having maximum allowable viscosities.

Curve for Light Hydraulic Oil is based on a commonly used viscosity.
°Celsius = (°Fahrenheit —32) x 5/9

Converting Kinematic and Saybolt Viscosity to Absolute Viscosity



Useful Pump Terminology

A foothead of water represents 0.4331 lbs. per sq. in. at 60°F. In common practice 1/2 lb. per sq. in. is used.
Mean atmospheric pressure at sea level is 14.7 lbs. per sq. in. and is equivalent to a column of mercury 29.92 inches high or a column of water 33.97 ft. high.
Doubling the diameter of a pipe increases its capacity per unit length 4 times. Friction of low viscosity liquids such as water varies approximately as the square of the velocity. Friction of viscous liquids such as oil varies under normal conditions directly as the velocity.
Static Suction Head is the vertical distance from liquid level to center line of pump in feet when level is higher than pump.
Static Suction Lift is the vertical distance from liquid level to center line of pump in feet when level is lower than pump. Friction Head is the resistance to flow caused by contact between liquid and pipe and, in addition, other frictional losses within the liquid itself as it moves in the pipe.
Discharge Head is the vertical distance between center line of pump and point of discharge.
Velocity Head is the pressure required to produce the velocity of the liquid and is equal to $V^2/64.4$ when V equals feet per second velocity.
Total Head is the sum of total of the suction, friction, discharge and velocity head.

Power required for pumping may be computed by use of the following formula:

H.P. = WxH/33,000xE or 0.000584 QP/E, where W is the weight of the liquid pumped per min. in pounds, H is the total head in feet (including frictional losses) and E is the efficiency of the pump. Q=gals per min.;P=lbs. per sq. in.

Viscosity is that property of a liquid which resists any force tending to produce flow. The greater the resistance to flow, the higher the viscosity. Thus, molasses has a higher viscosity than water. Viscosity is usually expressed in Saybolt Universal Seconds (S.S.U.) although there are various other systems.
Specific gravity is the ratio of the weight of a known volume of a material to the weight of an equal volume of water at 40°F. Thus at 40°F, the specific gravity of water is 1.0. Material having a specific gravity of 0.90 has a weight per unit volume of 90% that of water. When handling heavy liquids or liquid of a high viscosity, it is recommended that the pump speed be reduced and pipe sizes increased.

CLARK

DGM09 DC Magnet Drive Pump/Motor Unit

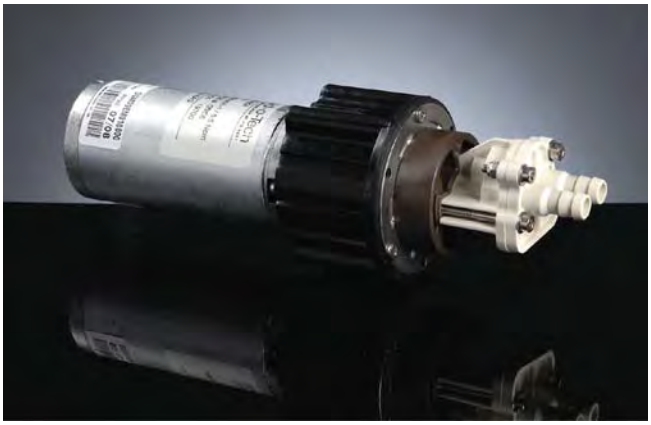
12 or 24 V DC, Flow to 140 LPH

DESCRIPTION

The DGM09 Series magnet drive gear pumps derive from the well established mag drive MG200 Series. Built to handle clean water and relatively viscous fluids at low pressure, the DGM09 Series pump-motor unit has low pulsation and is capable of handling fluids at a maximum temperature of 95°C (203°F).

The pump housing and the gears are made of Vectra. Seals are available in NBR, EPDM or VITON®. The extreme compactness of its design makes it the preferred choice where space is limited. Suction/discharge ports are 8 mm barbed end.

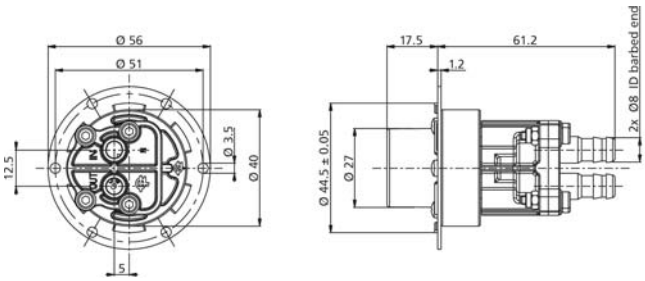
Motor: 12 or 24 V DC brush type
Speed: 3000 rpm
Weight: 0.55 Kg (1.21 Lbs)



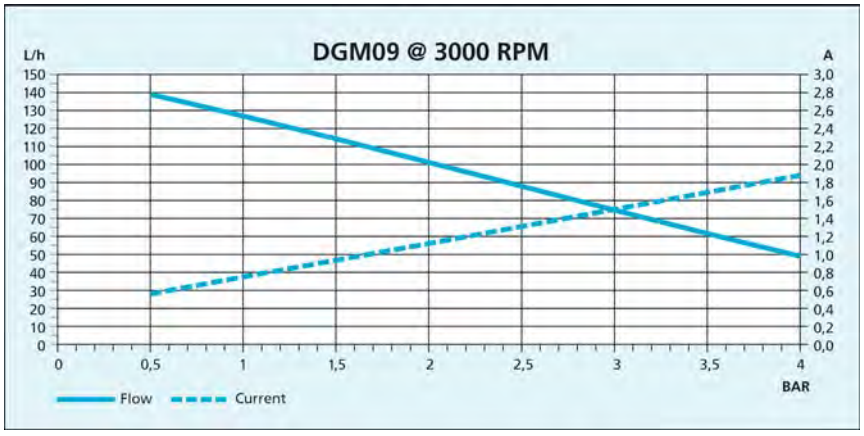
TYPICAL APPLICATIONS

- Water purification
- Laser cooling
- Water circulation
- Condensation removal
- Low pressure carbonation

DIMENSIONS (MM)



PERFORMANCE (PRESSURE, FLOW, CURRENT CONSUMPTION)



ORDERING INFORMATION

EXAMPLE MODEL NUMBER: DGM 09 E M01

A Model	B Gear Width	C Seal Material	D Motor Type
DGM	09 (9 mm)	E = EPDM N = NBR V = VITON	M01 = 3000 rpm, 24 VDC M03 = 3000 rpm, 12 VDC

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CLARK
MG200 Gear Pump With DC Motor
Flow to 190 LPH

DESCRIPTION
The "MG 200" Series magnet drive gear pumps are compact precision performance products for high technology applications. The magnet drive principle provides a totally sealed pump chamber which is capable of handling a wide range of corrosive liquids with a high degree of safety. The housing of the pump and the internal metal parts are in AISI 316 stainless steel and the gears are available in PTFE or PEEK.

In operation the MG 200 Series pumps are noiseless, pulsation-free and capable of handling relatively hot liquids i.e. 120°C (248°F) at a low coefficient of expansion. The principle of the magnet drive comprises an inner magnet, embodied in the pump, connected to the driving gear and an outer magnet connected to the motor shaft. The pole-to-pole alignment of the magnets provides the driving motion to the pump. Decoupling occurs when the pump load exceeds the coupling torque between the magnets.

In/out ports have 1/8'' NPT female threads. A built-in relief valve is available upon request.

Models are offered with a choice of 12 VDC or 24 VDC motors.

TYPICAL APPLICATIONS
- Medical and surgical equipment
- Hemodialysis apparatus
- Exhaust fumes treatment
- Cooling systems
- Ink-jet printing systems
- Water purification and ultra-filtration
- Lubrication
- Seal flush
- Sampling
- Lab instrumentation
- Laser apparatus

SPECIFICATIONS
Flow Range: Three pump sizes- 4 mm, 9 mm or 13 mm gears, see flow charts (Fig. 1)
Temperature ranges :
PTFE : -45°C (-49 F) / + 50°C (122F)
PEEK : -45°C (-49 F) / + 120°C (+248 F)

Max system pressure : 20 bar (290 psi)
Rotational Speed Limit: 5000 rpm
Priming With Water: 8m (26.7 ft), varies with operating conditions and fluid characteristics
Max Vacuum: 724 mm Hg (28.5" Hg)

FLOW WITH STANDARD PUMP HEADS & MOTORS

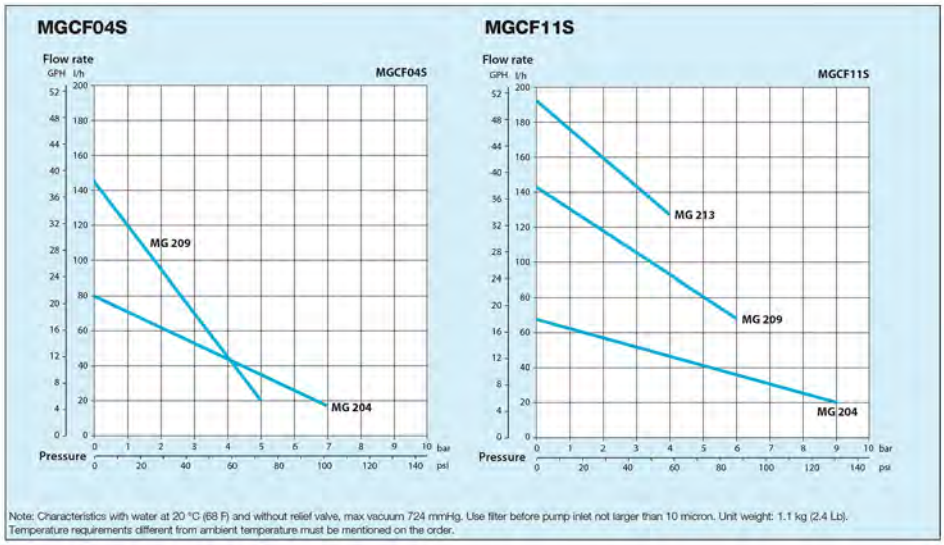

Fig. 1

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Table 1	DC Motor Coupling Components		
Item	**Description**	**Note**	**Order Code**
A	Ferrite Drive Magnet	For 5 mm bore	MGAF05S
A+B	Complete Adaptor	For M56B14 Motor	MGBF42S
A+B+C	Complete Motor Assembly	See Table Below	MGCF04S MGCF11S

Table 2	Motor Assembly	
	MGCF04S	**MGCF11S**
Voltage	12 VDC	24 VDC
Rated Speed (rpm)	3300	3000
Current Consumption (A)	3.4	1.5
Output Power (W/HP)	25.9/.0347	23.6/.0316
Weight (g/lb)	700/1.54	700/1.54

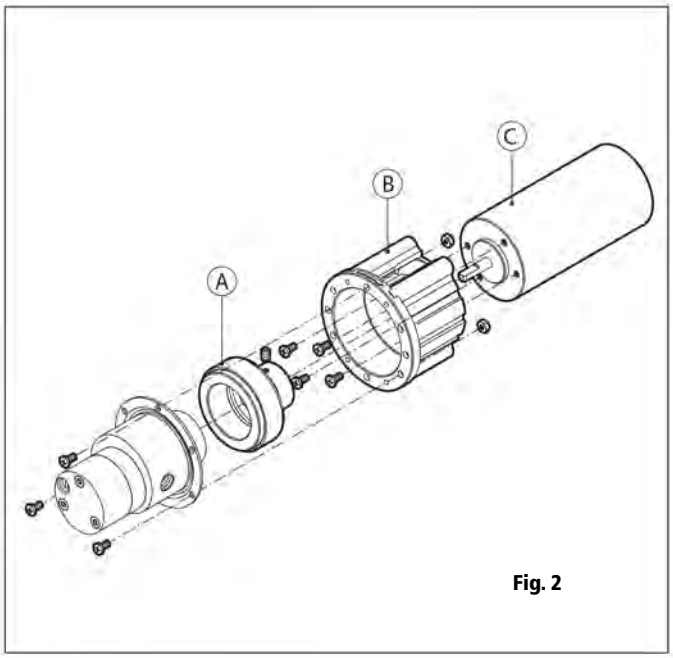

Fig. 2

DIMENSIONS

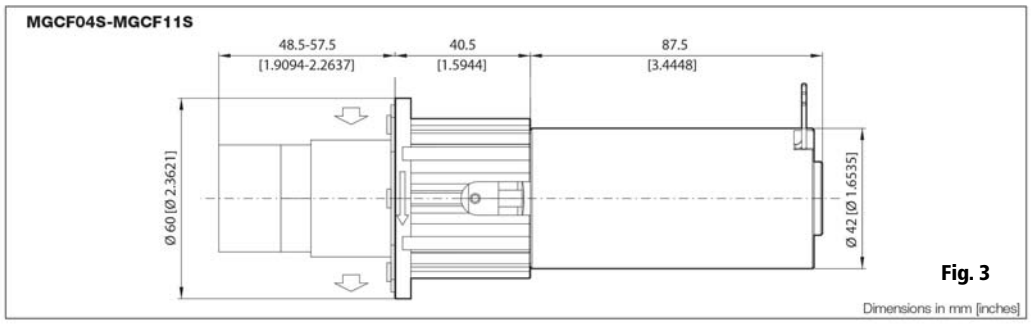

Fig. 3

ORDERING INFORMATION

1) Order Complete Motor Assembly Per Tables 1&2
Example: MGCF11S
2) Order Pump Per Table 3: ABCDEFG
Example: MG204XD1PT

Table 3

A Pump Model	B Gear Width	C Housing Material	D Connections	E Relief Valve	F Gear Material	G Static Seal
MG2= Ferrite Magnet, PTFE Flat Seal	04= 4 mm 09= 9 mm 13= 13 mm	X= 316 SS	D= 1/8" NPT	1= Yes 0= No	P= PEEK T= PTFE	T= PTFE

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CLARK

FG Magnetic Drive Gear Pumps w/Brushless 24VDC Motor

Integrated Motor Driver Circuit, Chemically Resistant Design, Flow to 205 LPH

DESCRIPTION

The FG series combines a 24V brushless DC drive motor electromagnetically coupled to a precision MG series gear pump. This high end unit is capable of handling fluids in the most demanding applications.

The service life of the unit is greatly extended because there are no moving motor parts. This integration of the pump and motor provides a leak free fluidic unit with a high degree of versatility.

The extreme accuracy of this unit delivers a smooth and pulsation free flow in all conditions. Different materials are available for a wide array of fluids and a built-in relief valve is available on request.

SPECIFICATIONS

Pump housing material: AISI 316L or PPS
Gears and bushings material: PEEK/PTFE
Ports: 1/8" NPT
Motor IP protection: IP52
Motor Drive Circuit: 24 VDC
Analog Input Speed Command- 0-5V, linearity speed vs command ±5% with no load
Output: 500-5000 RPM
Tach Out: 0-5V, source current max 5 mA;
Output square signal frequency, max 2.7 KHz
Unit weight: AISI 316L- 910g/2Lb; PPS- 550g/1.2Lb
Speed range: 500 to 5000 rpm
Max power: 50 W
Max static pressure: 20 bar/290 psi
Max Vacuum: 724 mmHg/28.5 inHg
Wet lift with water (Varies w/fluid & Operating Conditions):
~ 8 m/26.2 ft

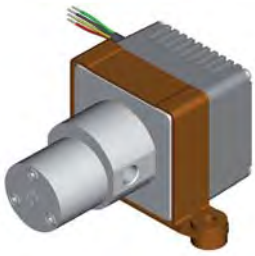
Operating Range			
Max ambient temperature	40 °C/104 °F	70 °C/158 °F	40 °C/104 °F
Fluid temperature	95 °C/203 °F	55 °C/131 °F	40 °C/104 °F
Max torque	30 mNm/4.2 in-oz at 5000 rpm	70 mNm/9.9 in-oz at 3500 rpm	100 mNm/14.1 in-oz at 3500 rpm
Min ambient temperature	5 °C/41 °F		

APPLICATIONS

- Medical and surgical equipment
- Hemodialysis apparatus
- Laser apparatus
- Lubrication
- Ink-jet printing systems
- Cooling systems
- Laboratory instrumentation
- Water purification and ultra-filtration
- Sampling
- Food processing equipment

MOUNTING

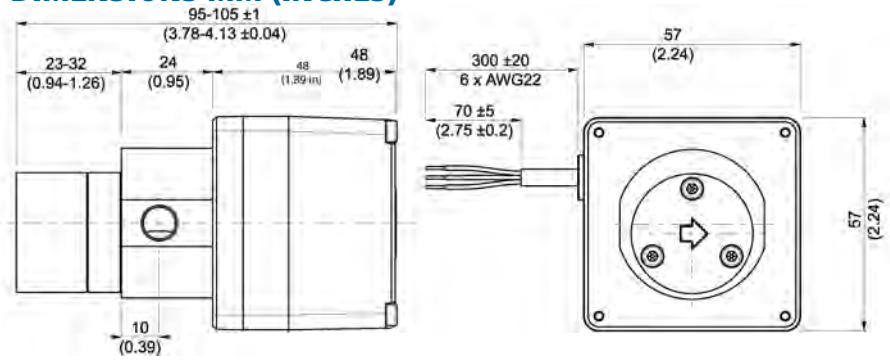
Front Flange Kit 94-83-01



Metal Bracket 94-83-02

An "L" mounting bracket, P/N 94-08-04 is available
Screws (4) required: P/N90-14-19 (M3x50mm)
This bracket attaches to the end of the FG motor.

DIMENSIONS MM (INCHES)



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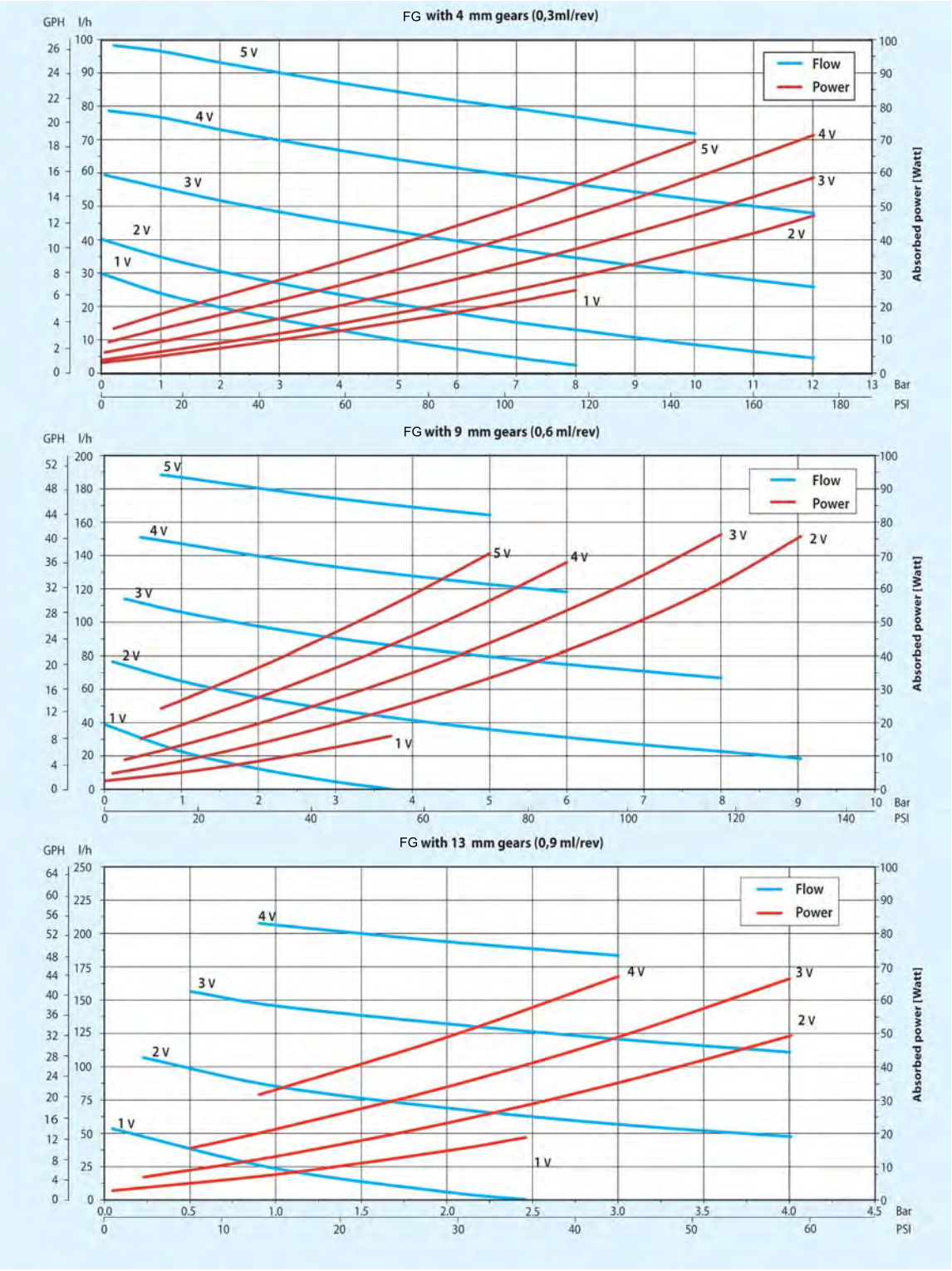


Note: Characteristics with water at 20 °C (68) °F) and without relief valve, max vacuum 724 mmHg. Use a filter before the pump inlet no larger than 10 micron. Temperature requirements different from ambient temperature must be mentioned on the order. Different materials are available upon request

ORDERING INFORMATION

Model	Description
FG204XD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 4 mm (PEEK or Teflon) Gears, 316 SS Body & Teflon Static Seal
FG209XD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 9 mm (PEEK or Teflon) Gears, 316 SS Body & Teflon Static Seal
FG213XD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 13 mm (PEEK or Teflon) Gears, 316 SS Body & Teflon Static Seal
FG204RD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 4 mm (PEEK or Teflon) Gears, PPS Body & Teflon Static Seal
FG209RD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 9 mm (PEEK or Teflon) Gears, PPS Body & Teflon Static Seal
FG213RD0(P,T)T1000	24 VDC Brushless Motor, MG2 Pump with 13 mm (PEEK or Teflon) Gears, PPS Body & Teflon Static Seal

Model	Description
94-83-01	Front Flange Kit
94-83-02	Metal Bracket

MG200 Gear Pump with Brushless DC Motor

0 to 210 LPH, Pressure to 5 bar

DESCRIPTION

The MG200 Series magnet drive gear pumps are compact precision performance products for high technology applications. The magnet drive principle provides a totally sealed pump chamber that is capable of handling a wide range of corrosive liquids with a high degree of safety. The housing of the pump and the internal metal parts are AISI 316 stainless steel. The gears are available in PTFE or PEEK.

In operation the MG 200 Series pumps are noiseless, pulsation-free and capable of handling relatively hot liquids i.e. 120°C (248°F) at a low coefficient of expansion. The principle of the magnet drive comprises an inner PEEK encapsulated magnet embodied in the pump, connected to the driving gear and an outer magnet connected to the motor shaft. The pole-to-pole alignment of the magnets provides the driving motion to the pump. Decoupling occurs when the pump load exceeds the coupling torque between the magnets.

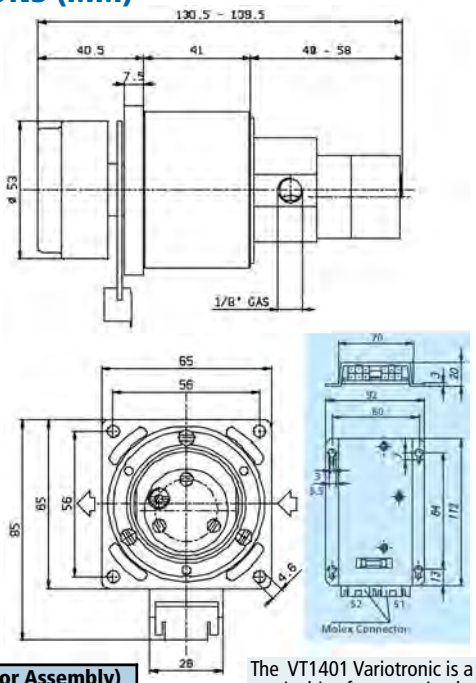
In/out ports have 1/8'' NPT female threads. A built-in relief valve is available upon request. The unit is supplied with 24 Volt brushless DC motor and Variotronic speed control system.

MG Gear Pump Shown With Motor & Drive

TYPICAL APPLICATIONS

- Medical equipment & Lab instruments
- Lubrication
- Sampling
- Cooling systems & Lasers
- Ink-jet printing systems

DIMENSIONS (MM)

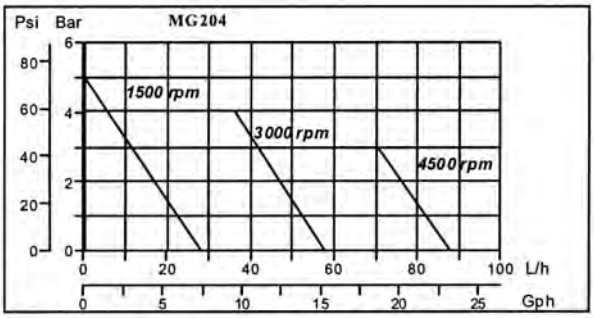


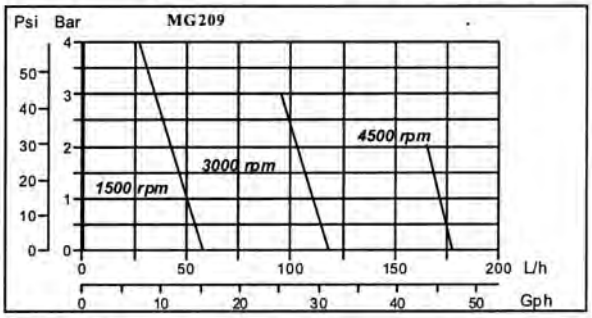
MGBR1 (Motor Assembly)	
Nom. Voltage	24 VDC
Voltage Range	10-30 VDC
Nom. Speed	6000 RPM
Nom. Torque	56 mNm
Nom. Current	2.8 A
Nom. Output Power	35 W

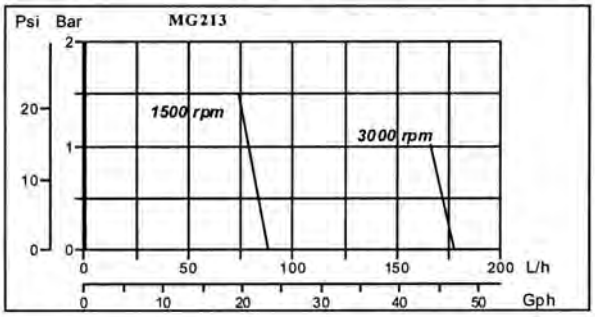
The VT1401 Variotronic is a compact electronic drive for operating brushless, electrically commutated direct current motors.

Speed is set via a command voltage of 0-10 V. A speed controller compares the command voltage with the actual speed value and preset PI control settings adjust the motor speed.

Note: See our Model FG, for a gear pump with integrated brushless DC motor and controller.







ORDERING INFORMATION

1) Order motor assembly separately- (MGBR1)
2) Order optional Variatronic controller- (VT1401)
3) Build Pump Part Number From Table- (MG209XP017)

Model	Gear Width	Housing	Gear/Bushing	ReliefValve	Connections
MG 2	04=4mm 09=9mm 13=13mm	X=Stainless Steel(316)	P=PEEK T=PTFE	1=Yes 0=No	17= 1/8" NPT Threaded in-line

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CLARK

MG200 Gear Pump With AC Motor or NEMA 56C Coupling

Flow to 200 LPH, Pressure to 9 bar

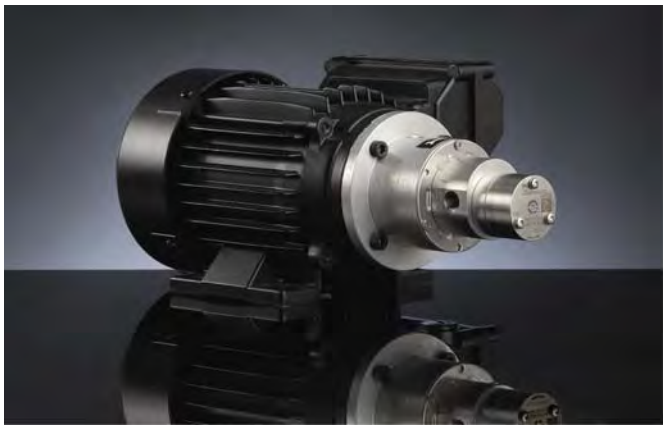
DESCRIPTION

The "MG 200" Series magnet drive gear pumps are compact precision performance products for high technology applications. The magnet drive principle provides a totally sealed pump chamber which is capable of handling a wide range of corrosive liquids with a high degree of safety. The housing of the pump and the internal metal parts are in AISI 316 stainless steel. The gears are available in PTFE or Peek.

In operation the MG 200 Series pumps are noiseless, pulsation-free and capable of handling relatively hot liquids i.e. 120°C (248°F) at a low coefficient of expansion. The principle of the magnet drive comprises an inner magnet, embodied in the pump, connected to the driving gear and an outer magnet connected to the motor shaft. The pole-to-pole alignment of the magnets provides the driving motion to the pump. Decoupling occurs when the pump load exceeds the coupling torque between the magnets.

In/out ports have 1/8'' NPT female threads. A built-in relief valve is available upon request.

Models are offered with a selection of AC motors or with 56C frame adaptor couplings with drive magnet.



TYPICAL APPLICATIONS

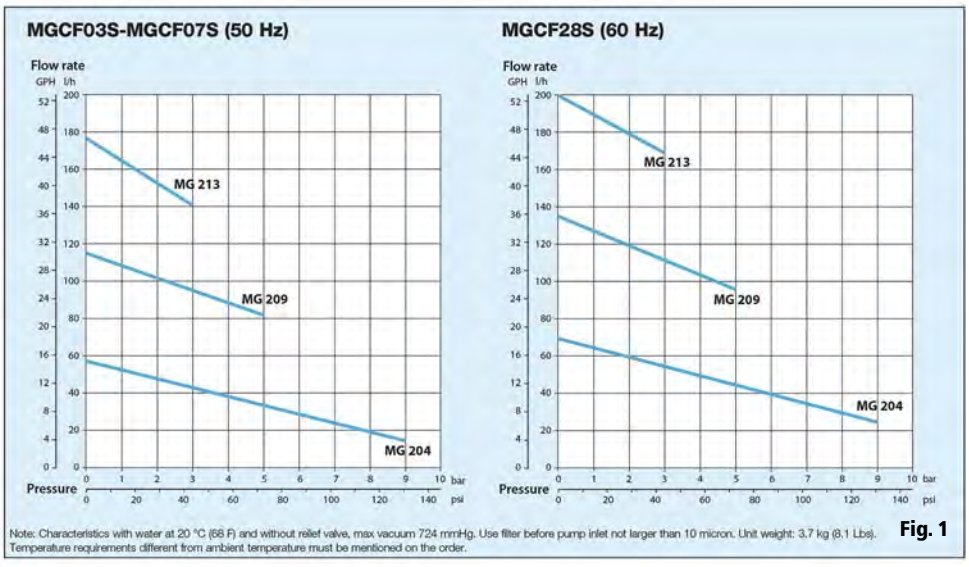
- Medical and surgical equipment
- Hemodialysis apparatus
- Exhaust fumes treatment
- Cooling systems
- Ink-jet printing systems
- Water purification and ultra-filtration
- Lubrication
- Seal flush
- Sampling
- Lab instruments
- Laser apparatus

SPECIFICATIONS

Flow Range: Three pump sizes- 4 mm, 9 mm or 13 mm gears, see flow charts (Fig. 1)
Temperature ranges :
PTFE : -45°C (-49 F) / + 50°C (122F)
PEEK : -45°C (-49 F) / + 120°C (+248 F)

Max system pressure : 20 bar (290 psi)
Rotational Speed Limit: 5000 rpm
Priming With Water: 8m (26.7 ft), varies with operating conditions and fluid characteristics
Max Vacuum: 724 mm Hg (28.5" Hg)

FLOW WITH STANDARD PUMP HEADS & MOTORS



Note: Characteristics with water at 20 °C (68 F) and without relief valve, max vacuum 724 mmHg. Use filter before pump inlet not larger than 10 micron. Unit weight: 3.7 kg (8.1 Lbs). Temperature requirements different from ambient temperature must be mentioned on the order.

Fig. 1

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Table 1	AC Motor Coupling Components		
Item	**Description**	**Note**	**Order Code**
M56B14 Motors			
A	Ferrite Drive Magnet	For 9 mm bore	MGAF09S
A+B	Complete Adaptor	For M56B14 Motor	MGBF56S
A+B+C	Complete Motor Assembly	See Table Below	MGCF03S MGCF07S MGCF28S
NEMA 56C Frame Motor Adaptor			
A	Ferrite Drive Magnet	For 5/8 bore	MGAF5BC
A+B	Complete Adaptor	For NEMA 56C	95-05-08

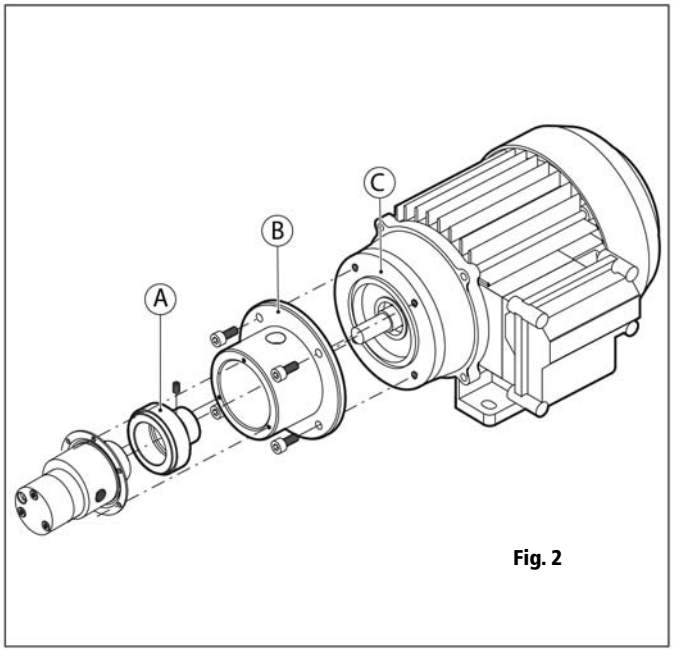

Fig. 2

Table 2	Motor Assembly		
	MGCF03S	**MGCF075**	**MGCF28S**
Voltage	230 VAC, Single Phase	230/400 VAC, Three Phase	110 VAC, Three Phase
Frequency (Hz)	50	50	60
Poles	2	2	2
Rated Speed (rpm)	2610	2780	3550
Current Consumption (A)	1.1	0.42	1.27
Output Power (W/HP)	110/.147	130/.175	110/.147
Operation	Continuous	Continuous	Continuous
Weight (Kg/lb)	3.3/7.28	3.3/7.28	3.5/7.72

DIMENSIONS

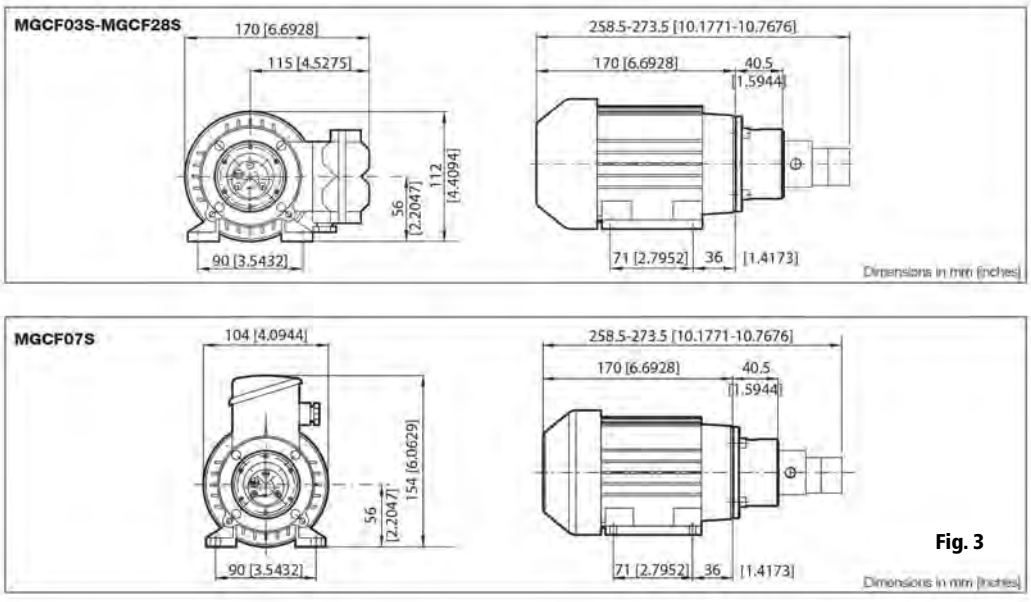

Fig. 3

ORDERING INFORMATION

1) Order Complete Motor Assembly or Motor Coupling Components (if supplying motor separately) per Tables 1 & 2
Example: MGCF28S
2) Order Pump Per Table 3: ABCDEFG
Example: MG204XD1PT

Table 3

A Pump Model	B Gear Width	C Housing Material	D Connections	E Relief Valve	F Gear Material	G Static Seal
MG2= Ferrite Magnet, PTFE Flat Seal	04= 4 mm 09= 9 mm 13= 13 mm	X= 316 SS	D= 1/8" NPT	1= Yes 0= No	P= PEEK T= PTFE	T= PTFE

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CLARK

MK200/300 Magnetic Driven Gear Pump With DC Motor

Flow to 240 LPH (63.4 GPH), Pressure to 20 Bar (290 PSI)

DESCRIPTION

The MK 200/300 series pumps are designed to complete the existing MG 200 series with improved performance in terms of flow rate, pressure,capability to handle high viscosityfluids and a wider offer of materials to suit most applications,from the food to theindustrial and chemical markets.

The housing of the pump and the internal metal parts are AISI 316L .In/Out ports have 1/4'' NPT female threads. The gears are available in PTFE or PEEk™. The driving magnet is rare earth type, capable of driving the pump at high pressure.

The quality of the materials of the assembled components allows handling of fluids with temperatures up to 120°C (248°F).

The motor with adaptor and drive magnet is heavy duty, providing a reliable and noiseless operation in a compact size package. The pole-to-pole alignment of the two magnets provides the driving motion to the pump. Decoupling will occur when the pump load exceeds the maximum coupling torque provided by the alignment of the two magnets.

TYPICAL APPLICATIONS

- Medical and surgical equipment
- Hemodialysis apparatus
- Exhaust fumes treatment
- Cooling systems
- Ink-jet printing systems
- Water purification and ultra-filtration
- Lubrication
- Seal flush
- Sampling
- Lab instrumentation
- Laser apparatus

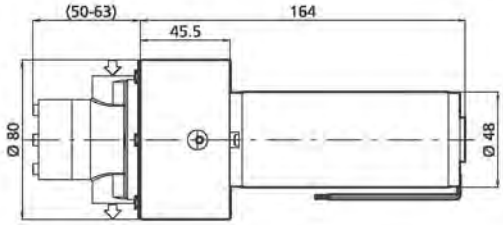
SPECIFICATIONS

Pump Housing Material: 316 SS
Gears & Bushing Material: PEEK/PTFE
Connections: 1/4" NPT
Flow Range: Three pump sizes- MK 309, MK 313, MK 317 (9 mm, 13 mm or 17 mm gears), see flow charts

Temperature ranges :
PTFE : -45°C (-49 F) / + 50°C (+122° F)
PEEK : -45°C (-49 F) / + 120°C (+248° F)
Max system pressure : 20 bar (290 psi)
Pump/Motor weight: 2 Kg (4.4 lbs)
NSF listed pumps are available for potable water.

DIMENSIONS (MM)

Pump with 12V Motor
Motor/Drive Model MKCS08S



Pump with 24V Motor
Motor/Drive Model MKCS11S

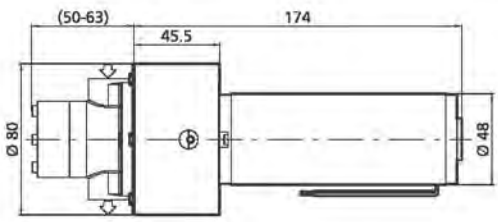
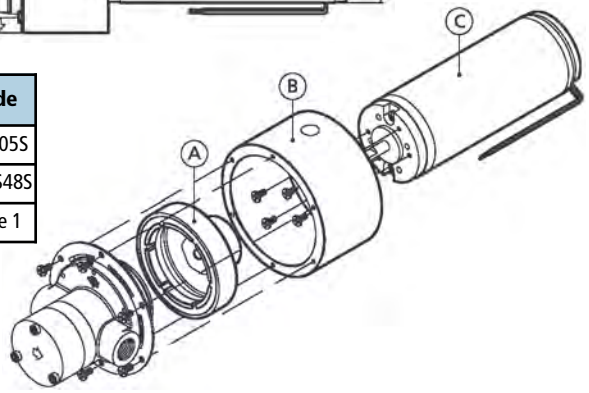


Table 1 Drive, Adapter & Motor Assembly

Model includes Drive Magnet (A), Motor Adapter (B) & Motor (C)	Model MKCS08S	Model MKCS11S
Voltage (V)	12 DC	24DC
Rated Speed (rpm)	3,050	3,150
Current Consumption (A)	3.4	2.6
Output Power (W/HP)	32/.0429	49.5/.0664
Weight (g/lb)	910/2.1	980/2.16

	Description	Code
A	Drive Magnet for 5 mm Drive	MKA05S
B	Motor adapter	MKBS48S
C	12 or 24 VDC Motor	Table 1



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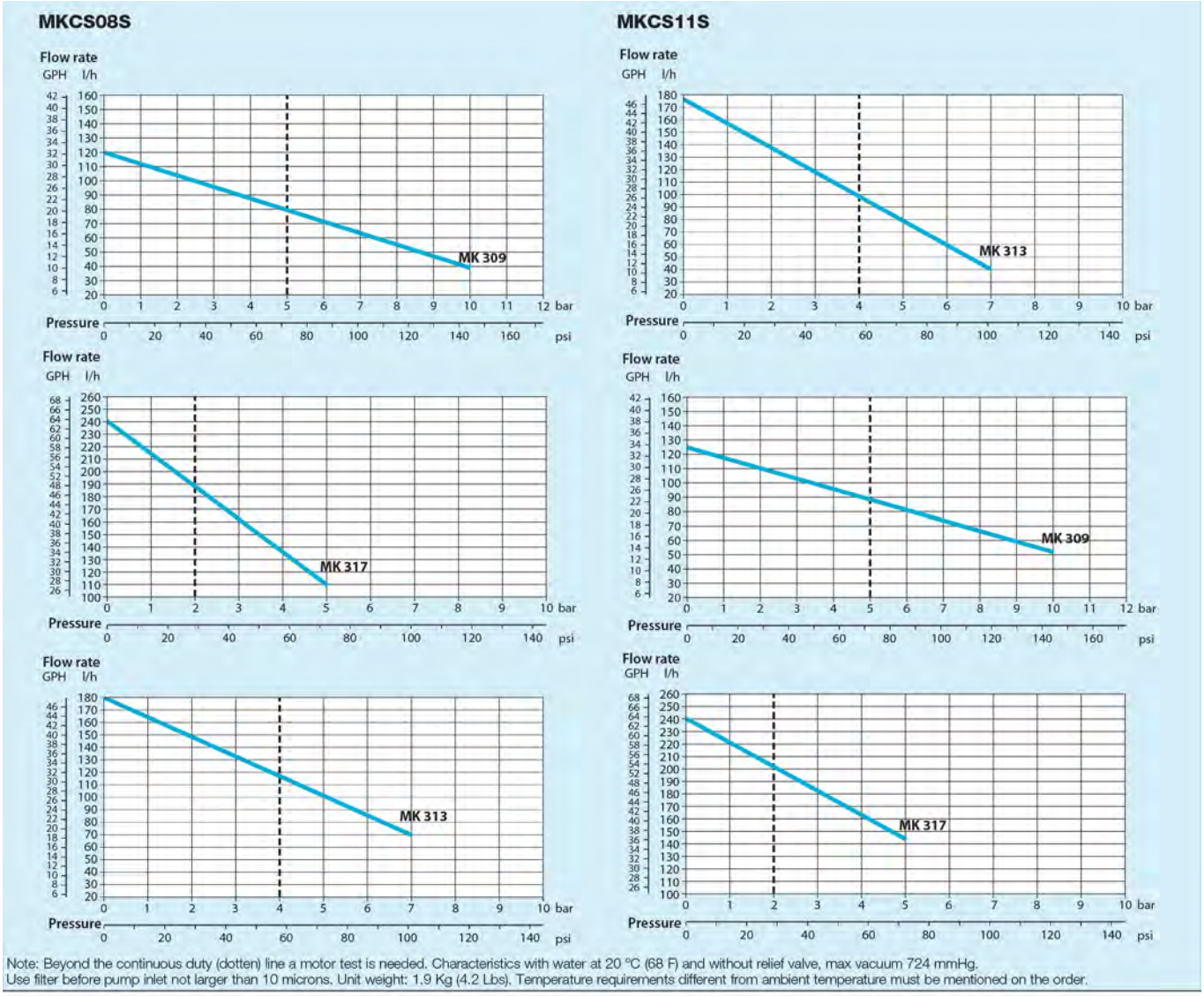
FLOW CURVES



Note: Beyond the continuous duty (dotten) line a motor test is needed. Characteristics with water at 20 °C (68 F) and without relief valve, max vacuum 724 mmHg.
Use filter before pump inlet not larger than 10 microns. Unit weight: 1.9 Kg (4.2 Lbs). Temperature requirements different from ambient temperature must be mentioned on the order.

ORDERING INFORMATION

1) Order Drive, Adaptor & Motor Assembly from Table 1

EXAMPLE: MKCS11S

2) Order Pump From Table 2 Below

EXAMPLE: MK309X170PV

Table 2- Pump Part Number ABCDEFG

A *Pump Series	B Gear Width	C Housing Material	F Connections	E Relief Valve	D Gear Material	G *Static Seal Material
MK2= PTFE Flat Seals MK3= O-ring Seal	09= 9mm 13= 13mm 17= 17mm	X= AISI 316	17= 1/4" NPT	0= without 1= with MK3 is not available with relief valve	T= PTFE P= PEEK™	- =MK2 ordered S= Silicon N= NBR T= PTFE V= Viton

*Each pump has three seals, two for the pump body and one for the magnet cup. Model type MK2 has all PTFE flat seals. Model MK3 is offered with a choice of o-ring seal material. Note that the material choden in the order matrix is used for all three seal locations. If a relief valve is ordered the seal for the relief valve is always PTFE.

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MK200/300 Magnetic Drive Gear Pumps, PTFE/PEEK Gears

Flow to 69 GPH, Pressure to 290 PSI, Metric & NEMA 56C Motor Adaptors

DESCRIPTION

The MK200, MK300 and MK300 High Viscosity series pumps are designed to complete the existing MG200 series. They offer improved performance in terms of flow rate, pressure, capability to handle high viscosity fluids and a wider offer of materials to suit most applications from food to industrial and chemical markets. The housing of the pump and the internal metal parts are avaliable in AISI 303, AISI 316L or SAF 2205. The gears are available in PTFE or PEEK™. The PEEK™ encapsulated driving magnet, available in Ferrite or in rare earths, is able to drive the pump at high pressure. The quality of the materials of the assembled components allows handling of fluids with temperatures up to 120°C (248°F).

Metric and NEMA 56C motor adaptor assemblies with pump drive magnets are offered for customer supplied motors.

The pulsation-free and noiseless operation is the result of precision gears accurately assembled and balanced within the housing combined with the magnetic coupling in perfect alignment.

MGK Without Motor

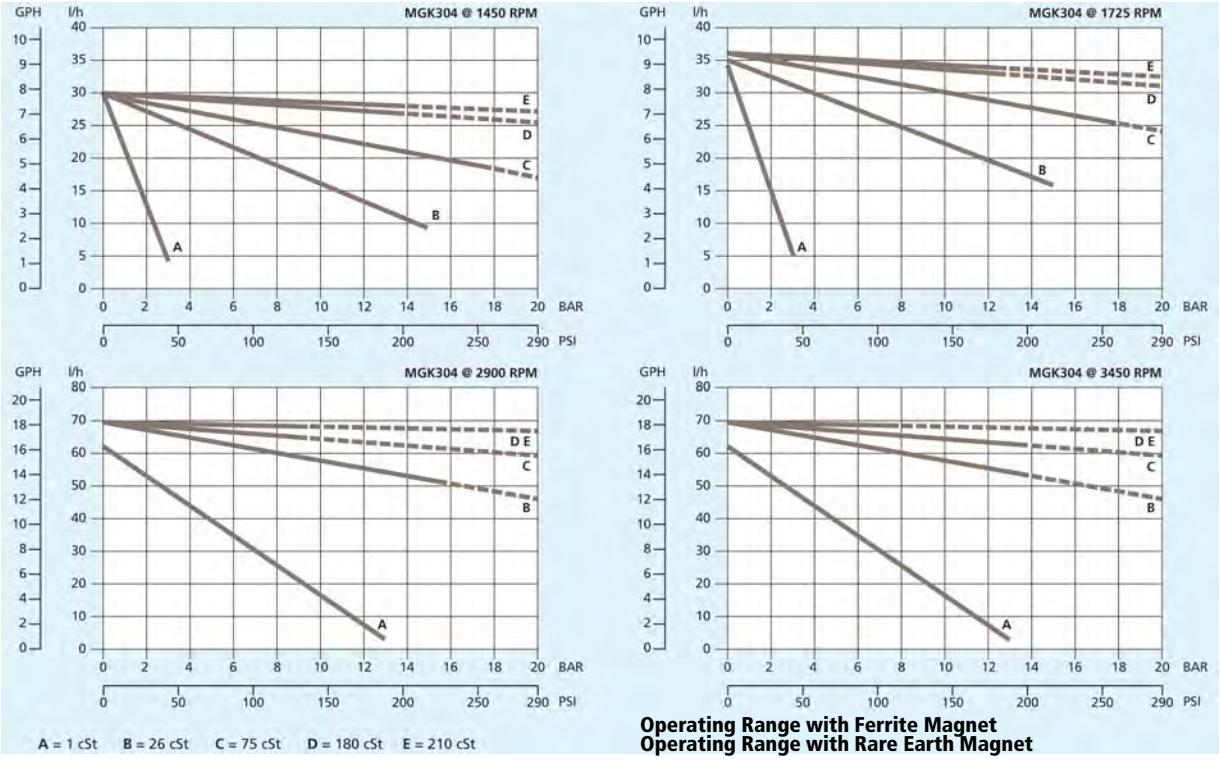
SPECIFICATIONS

Self priming
Connections: 1/4" NPT ports
Temperature range: PTFE -45 to 50°C/-49 to 122°F
PEEK™-45 to 120 °C/-49 to 248 °F
Max system pressure: 20 bar/290 psi
Flow: See performance curves
Motor Adaptors & Drive Magnets: See table 1
Relief valve: available for MGK200 series only

APPLICATIONS

- Medical and surgical equipment
- Hemodialysis apparatus
- Laser apparatus
- Lubrication
- Ink-jet printing systems
- Cooling systems
- Laboratory instrumentation
- Water purification and ultra-filtration
- Sampling
- Food processing equipment

MGK304 Performance at Different Viscosities



Operating Range with Ferrite Magnet
Operating Range with Rare Earth Magnet

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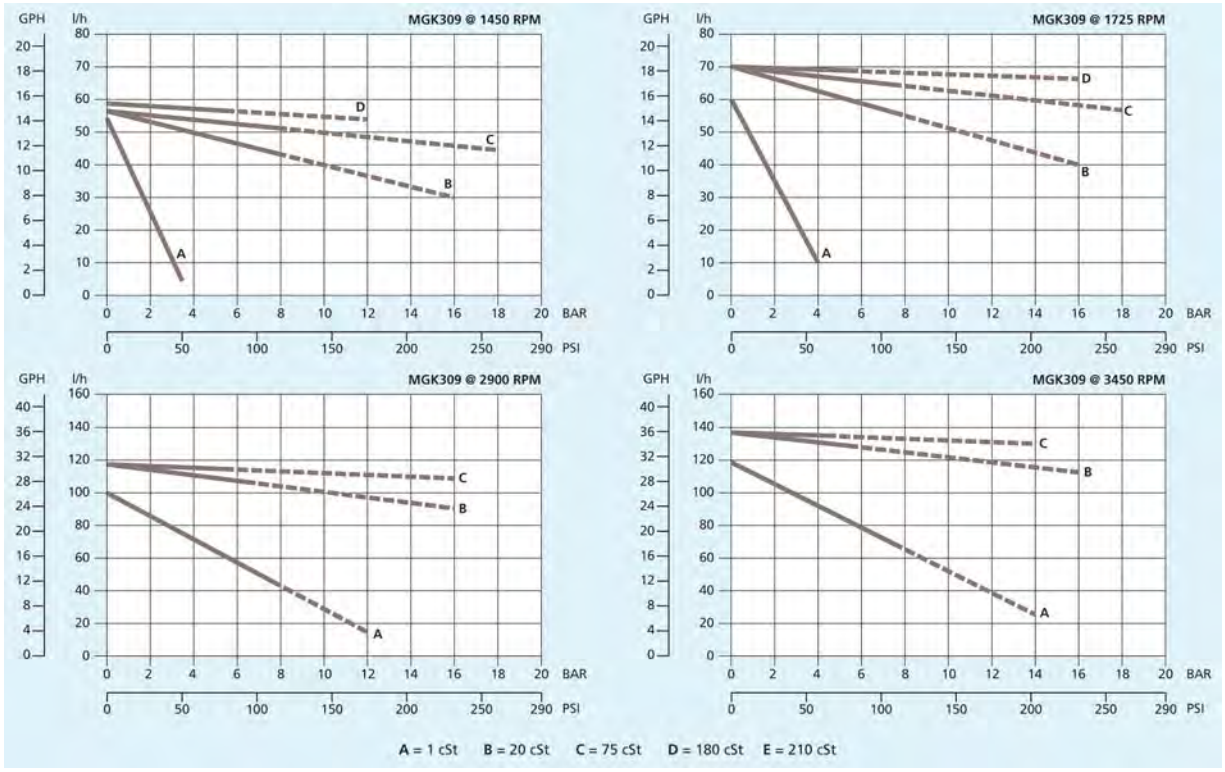
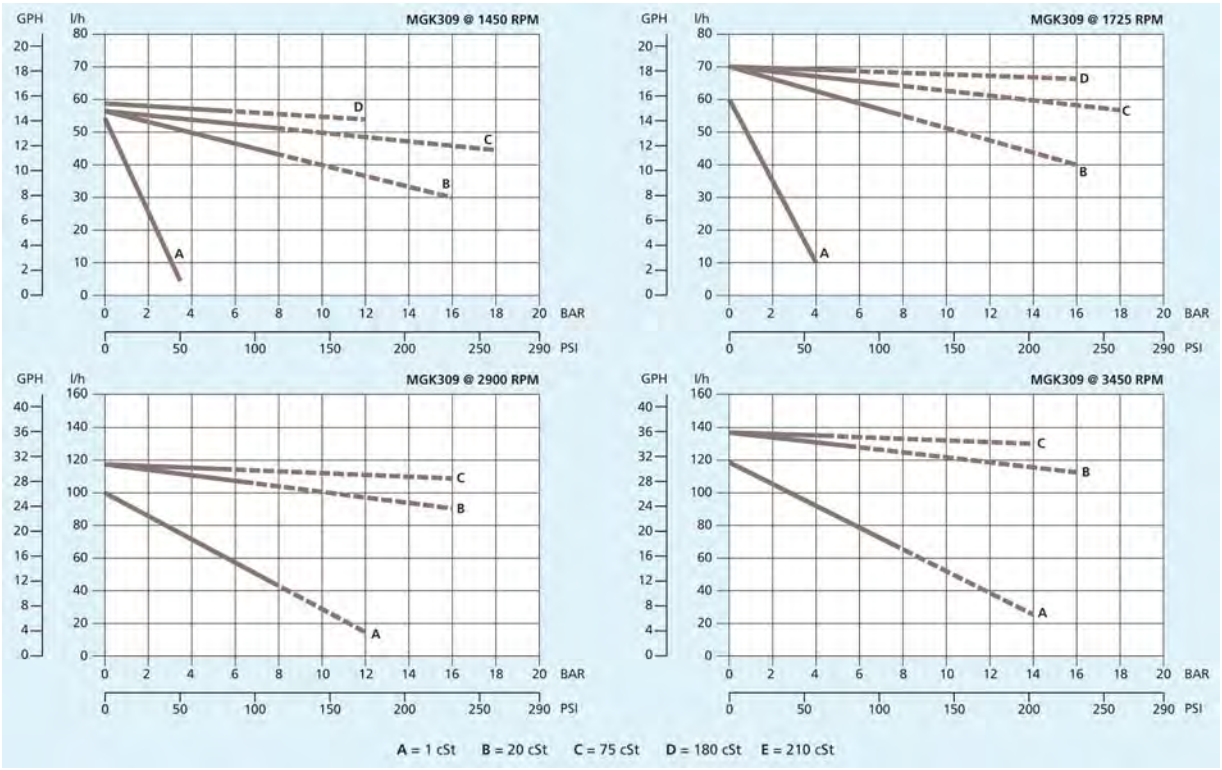
MGK309 Performance at Different Viscosities

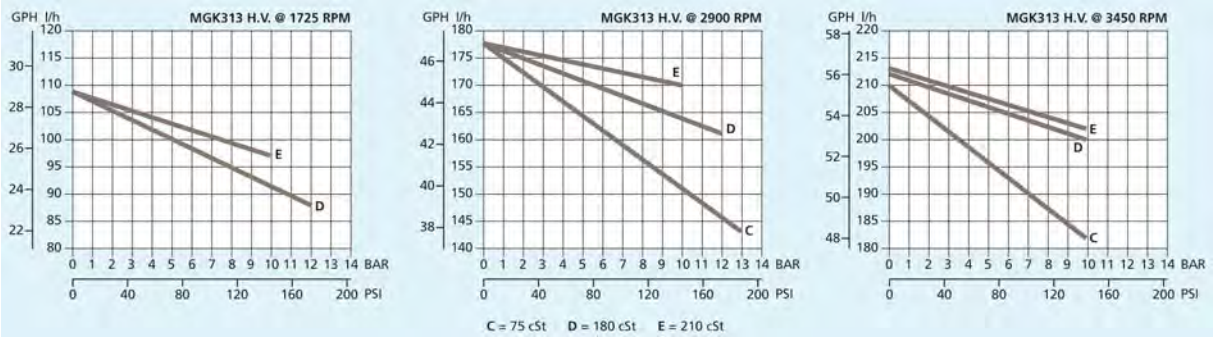


MGK313 Performance at Different Viscosities

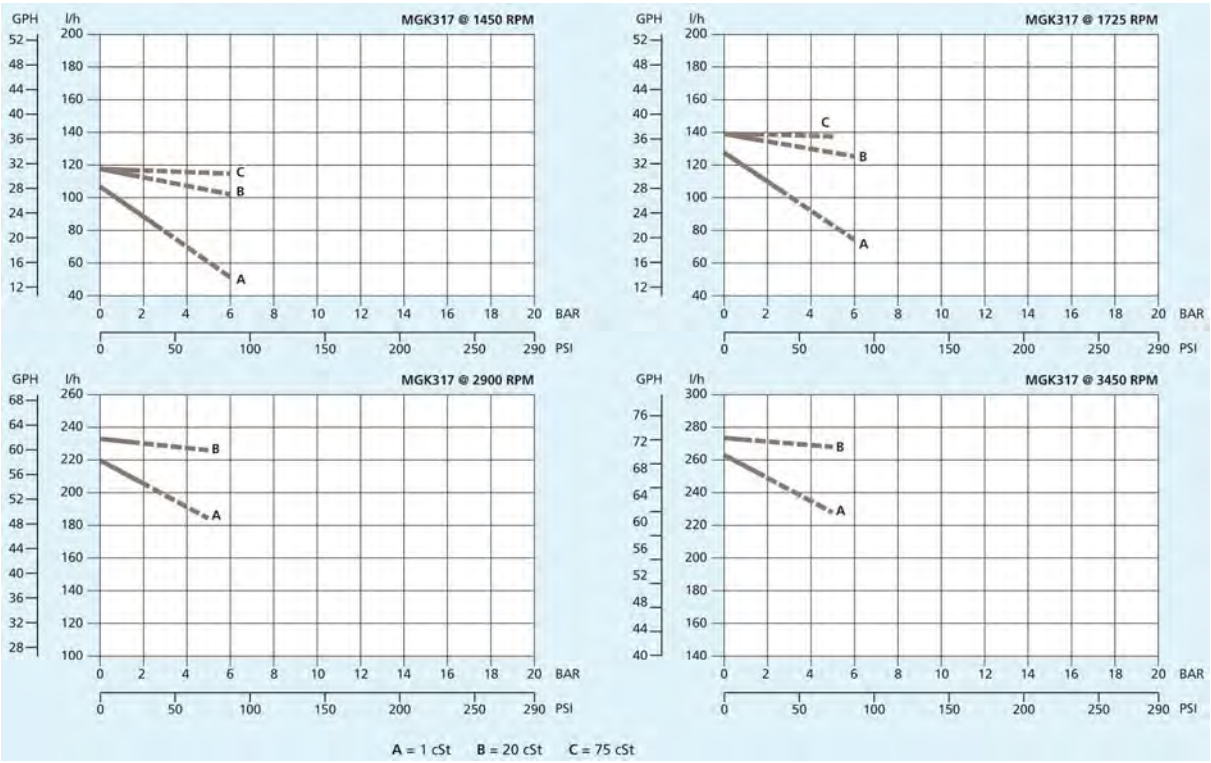


Operating Range with Ferrite Magnet
Operating Range with Rare Earth Magnet

MGK313 High Viscosity Performance at Different Viscosities

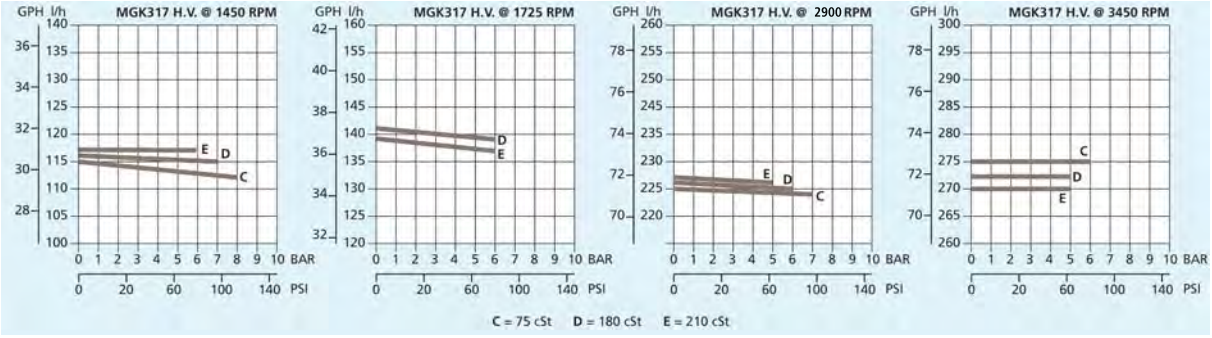


MGK317 Performance at Different Viscosities



Operating Range with Ferrite Magnet
Operating Range with Rare Earth Magnet

MGK317 High Viscosity Performance at Different Viscosities



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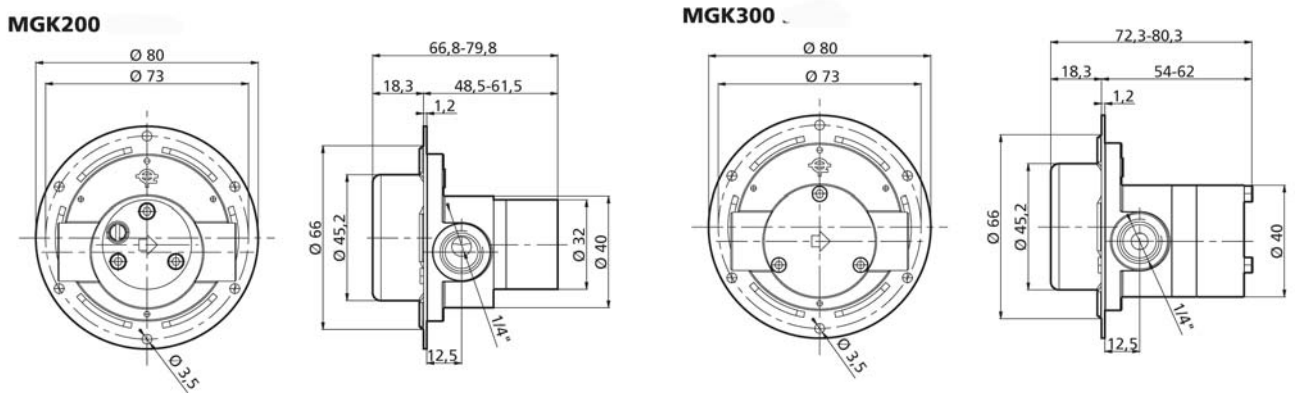
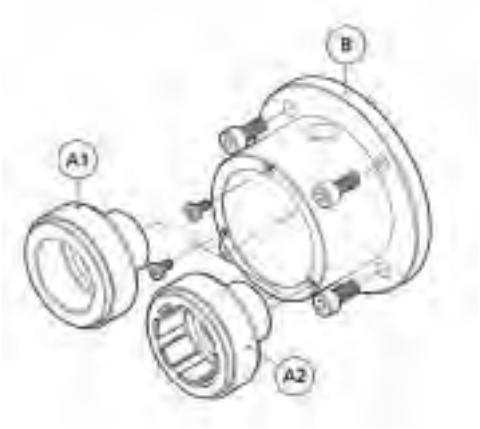
DIMENSIONS (MM) PUMP WITHOUT MOTOR



56C MOTOR COUPLING ASSEMBLY

Table 1- NEMA 56C Motor Adapters	
Model	**Description**
MKBF5BS	Includes MKAF5BS, 5/8" bore ferrite magnet (A1) and 92-06-05 NEMA 56C adaptor (B)
MKB55BS	Includes MKAS5BS, 5/8" bore rare earth magnet (A2) and 92-06-05 NEMA 56C adaptor (B)
MKBF56S	Includes MKAF09S, 9 mm bore ferrite magnet (A1) and 92-06-06 M56 B14 adaptor (B)
MKBS56S	Includes MKAS09S, 9 mm bore rare earth magnet (A2) and 92-06-06 M56 B14 adaptor (B)
MKBF63S	Includes MKAF11S, 11 mm bore ferrite magnet (A1) and 60058 M63 B14 adaptor (B)
MKBS63S	Includes MKAS11S, 11 mm bore rare earth magnet (A2) and 60058 M63 B14 adaptor (B)
Consult us for motor sizing	



ORDERING INFORMATION

1) Order Pump From Table 2 Below- ABCDEFG
EXAMPLE: MK309X170PV
2) Order Motor Adapter from Table 1
EXAMPLE: MKBF5BS

Table 2- Pump Part Number ABCDEFG						
A ***Pump Series**	**B** **Gear Width**	**C** **Housing Material**	**D** **Connections**	**E** **Relief Valve**	**F** **Gear Material**	**G** ***Static Seal Material**
MK2= PTFE Flat Seals MK3= O-ring Seal	09= 9mm 13= 13mm 17= 17mm	X= AISI 316	17= 1/4" NPT	0= without 1= with MK3 is not available with relief valve	T= PTFE P= PEEK™	- =MK2 ordered S= Silicon N= NBR T= PTFE V= Viton
*Each pump has three seals, two for the pump body and one for the magnet cup. Model type MK2 has all PTFE flat seals. Model MK3 is offered with a choice of o-ring seal material. Note that the material choden in the order matrix is used for all three seal locations. If a relief valve is ordered the seal for the relief valve is always PTFE.						

CLARK

MTC Series Magnet Drive External Gear Pumps

Flow to 10.5 GPM, Static Pressure to 500 PSI

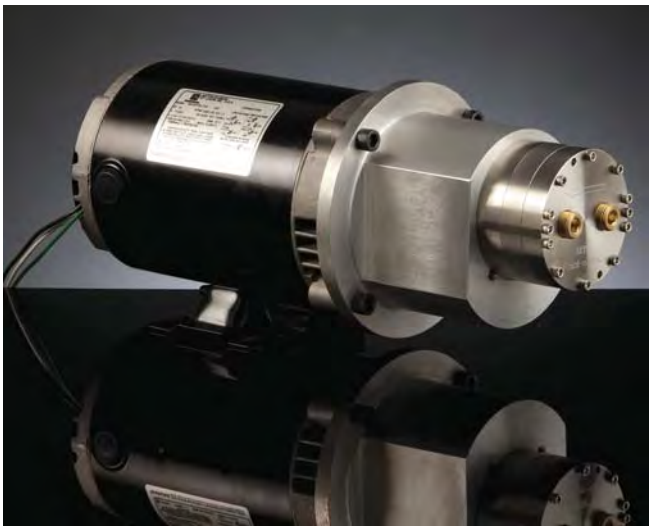
DESCRIPTION

The MTC magnetically coupled gear pump offers a flow range of up to 10.5 GPM with precision performance.

The MTC series works well in metering applications where environmental concerns or system pressure dictate the need for a leak-free, seal-less pump.

These pumps are designed to operate at either 2-pole or 4-pole speeds and provide quiet pulse free delivery with a wide range of fluids.

MTC Pumps are available in AISI 316L stainless steel or 6061 T651 anodized aluminum base material with PPS gears and bushings.



SPECIFICATIONS

Pump Housing: AISI 316L Stainless Steel or 6061 T651 anodized aluminum

Gears & Bushing Material: PPS

Ports: 3/8", 1/2" or 3/4" NPT; generally 3/8" NPT to 4.5 gpm, 1/2" NPT above 5 gpm, 3/4" NPTfor high viscosity fluids. Consult us.

Max Temperature : 60° C (140° F); For higher temperatures to 120°C (248° F) gears are sized for heat expansion, consult us.

MTC Models (3450 RPM)		
Model	***Connection**	**Description**
MTC10PPSS	1/2" NPT	10.6 GPM, PPS gears/bushings, 316L SS housing
MTC8PPSS	1/2" NPT	8.3 GPM, PPS gears/bushings, 316L SS housing
MTC6.5PPSS	1/2" NPT	6.9 GPM, PPS gears/bushings, 316L SS housing
MTC5.5PPSS	1/2" NPT	5.5 GPM, PPS gears/bushings, 316L SS housing
MTC4.5PPSS	3/8" NPT	4.6 GPM, PPS gears/bushings, 316L SS housing
MTC3.5PPSS	3/8" NPT	3.7 GPM, PPS gears/bushings, 316L SS housing
MTC2.5PPSS	3/8" NPT	2.8 GPM, PPS gears/bushings, 316L SS housing
*Port sizes can be increased model to model for high viscosity fluids		

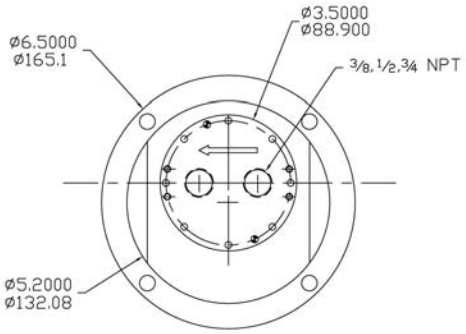
TYPICAL APPLICATIONS

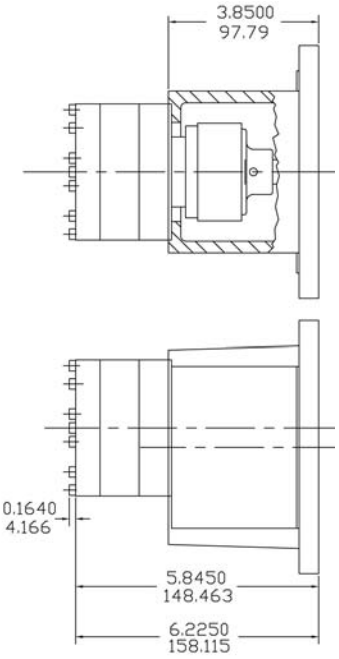
- X-ray equipment heat transfer fluids
- Semi-conductor process cooling
- Chemical transfer
- Metering
- Water purification
- Process temperature control
- Pumping of most clean or filtered fluids

Max. Speed: 4,000 rpm
Max Static Pressure: 500 psi (35 bar)
Viscosity Range: 0.3 to 1000 Cps
Max Vacuum: 28 in. Hg (724 mm Hg)
Motor Interface: 56C Frame Flange

DIMENSIONS (INCHES,MM)

PUMP/MAGNETIC COUPLING/56C FRAME FLANGE





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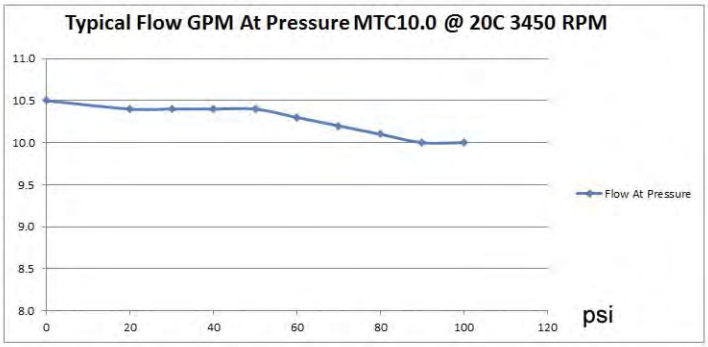
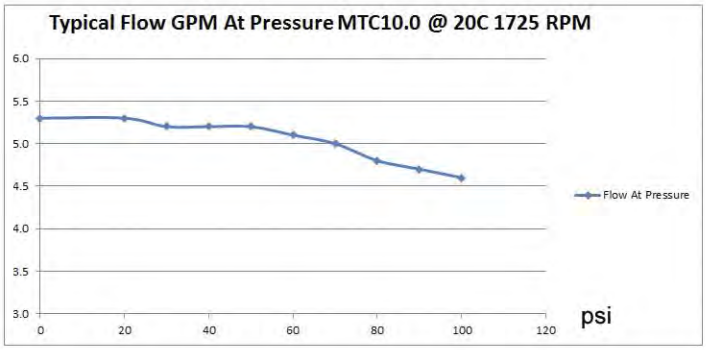
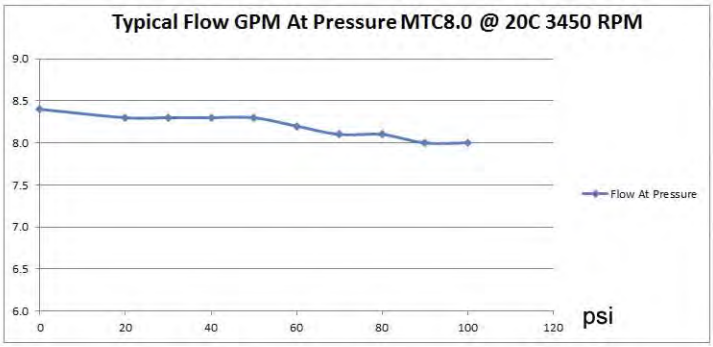
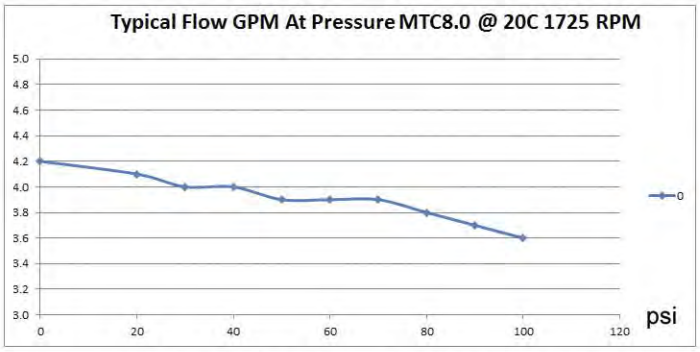
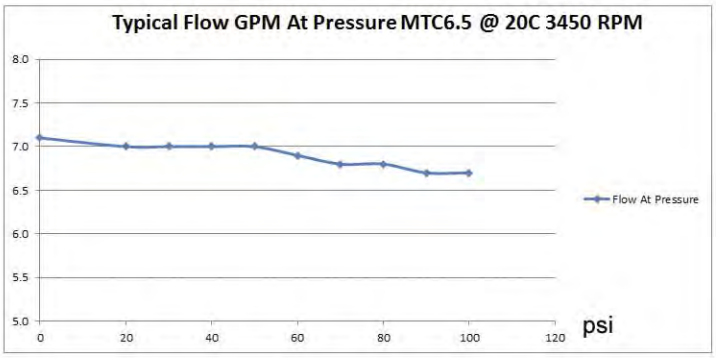
PUMP MODEL SELECTION/FLOW CURVES

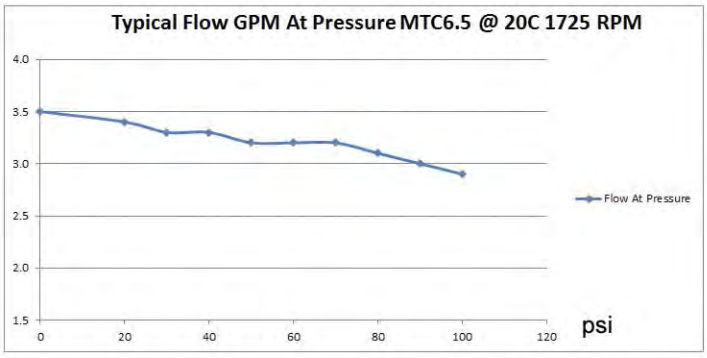


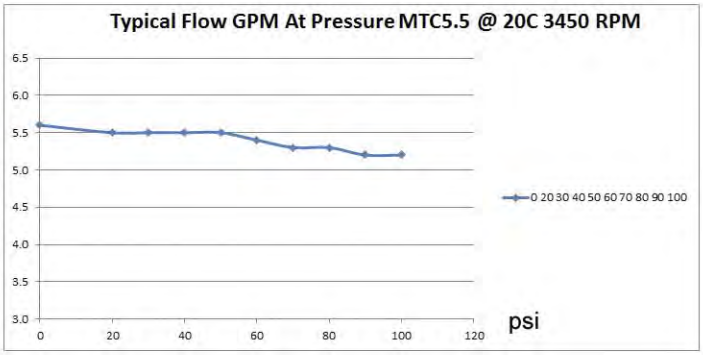


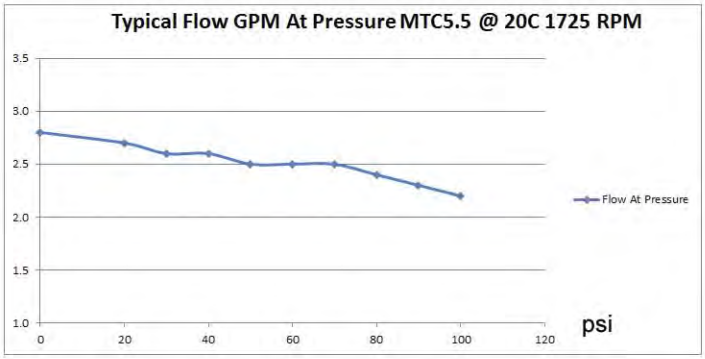


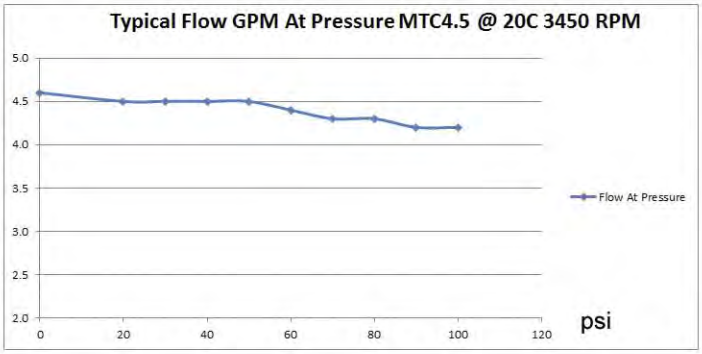


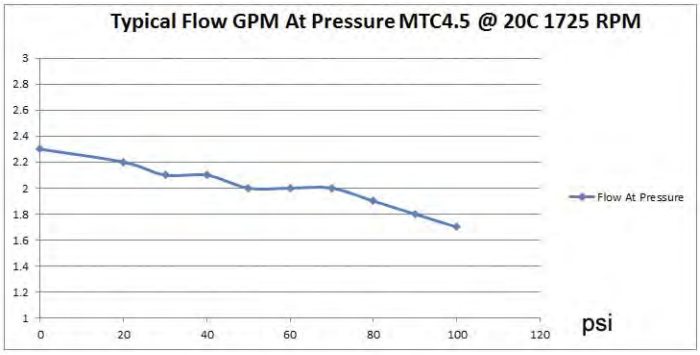


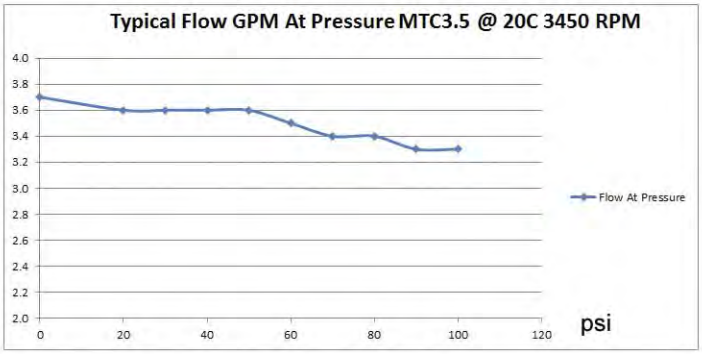


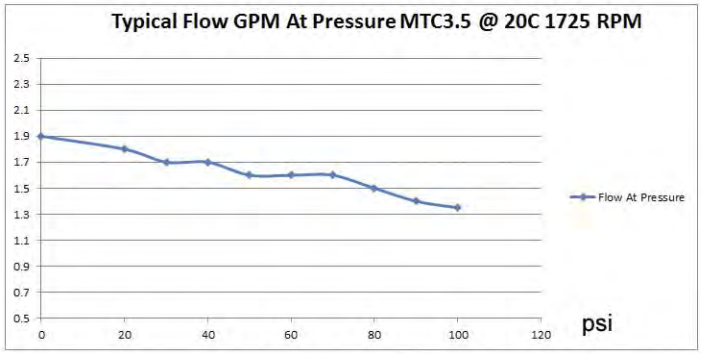


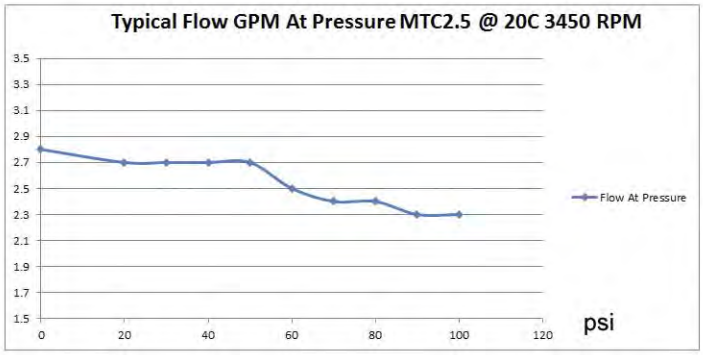


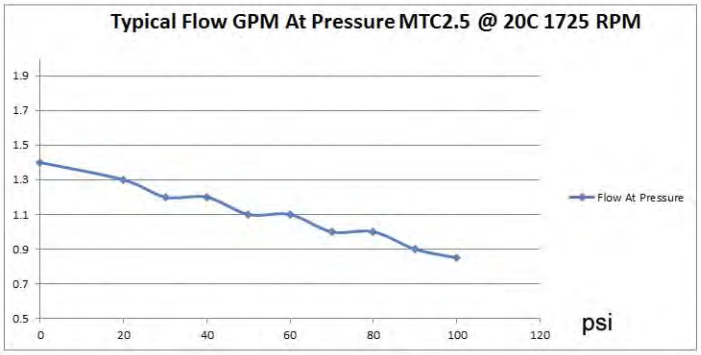












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CLARK

DGD09 DC Direct Drive Pump/Motor Unit

12/24 VDC, 1500, 3400, and 3900 rpm, Flow to 160 LPH

DESCRIPTION

The DGD09 Series direct drive gear pumps derive from the well established mag drive MG200 Series. Built to handle clean water and relatively viscous fluids at low pressure, the DGD09 Series pump-motor unit has low pulsation and is capable of handling fluids at a maximum temperature of 70 °C (158 °F).

The pump housing and the gears are made of Vectra. Seals are available in NBR or VITON®. The extreme compactness of its design makes it the preferred choice where space is limited. Suction and discharge ports are 8 mm barbed end.

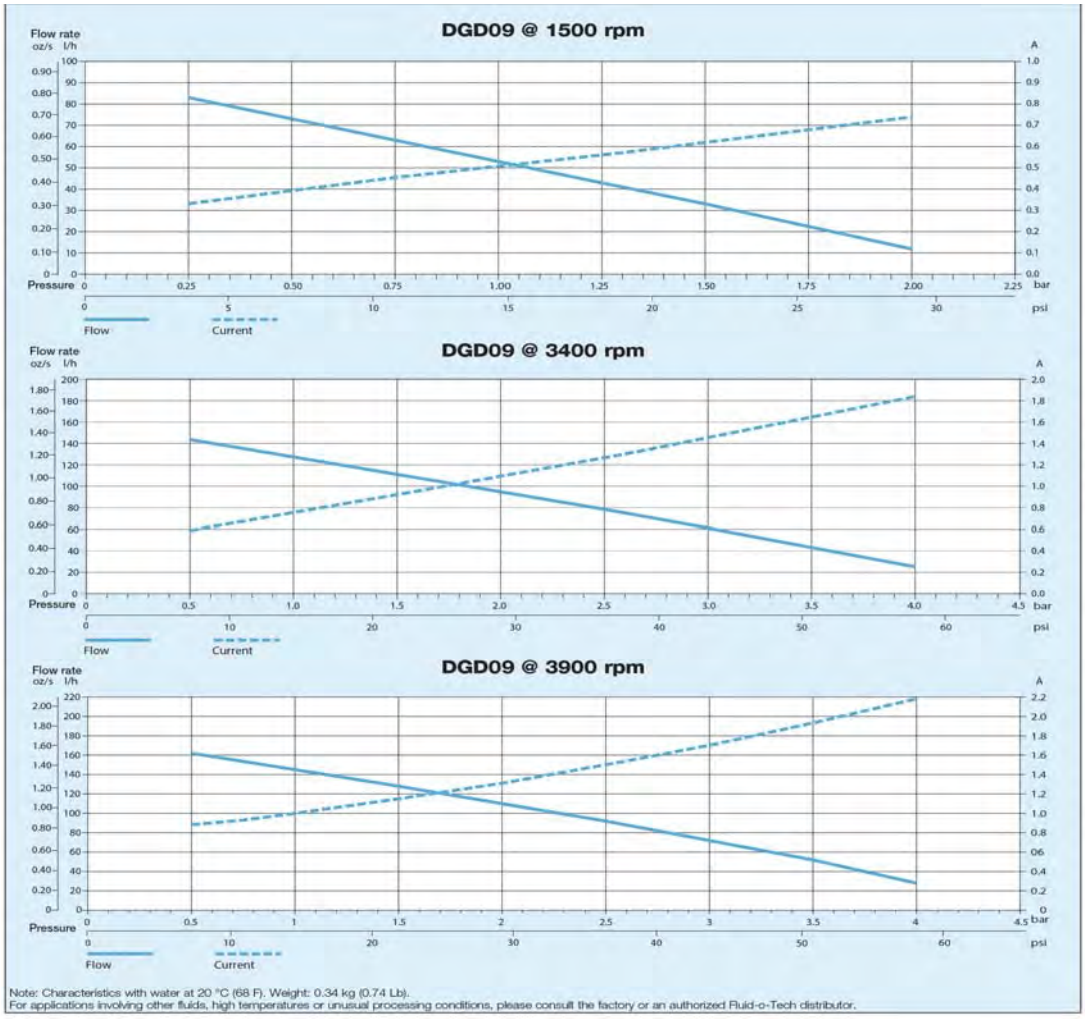
TYPICAL APPLICATIONS

- Water purification
- Laser cooling
- Water circulation
- Condensation removal
- Spraying
- Syrup Dispensing

SPECIFICATIONS

Motor: 12 or 24 V DC brush type
Speeds: 1500, 3400, 3900 rpm
Flow/Current Consumption : See performance curves
Suction/Discharge Port: 8 mm barb
Seal: NBR, Viton
Weight: 0.36 Kg (.79 Lbs)

PERFORMANCE (PRESSURE, FLOW, CURRENT CONSUMPTION)



Note: Characteristics with water at 20 °C (68 F). Weight: 0.34 kg (0.74 Lb).
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

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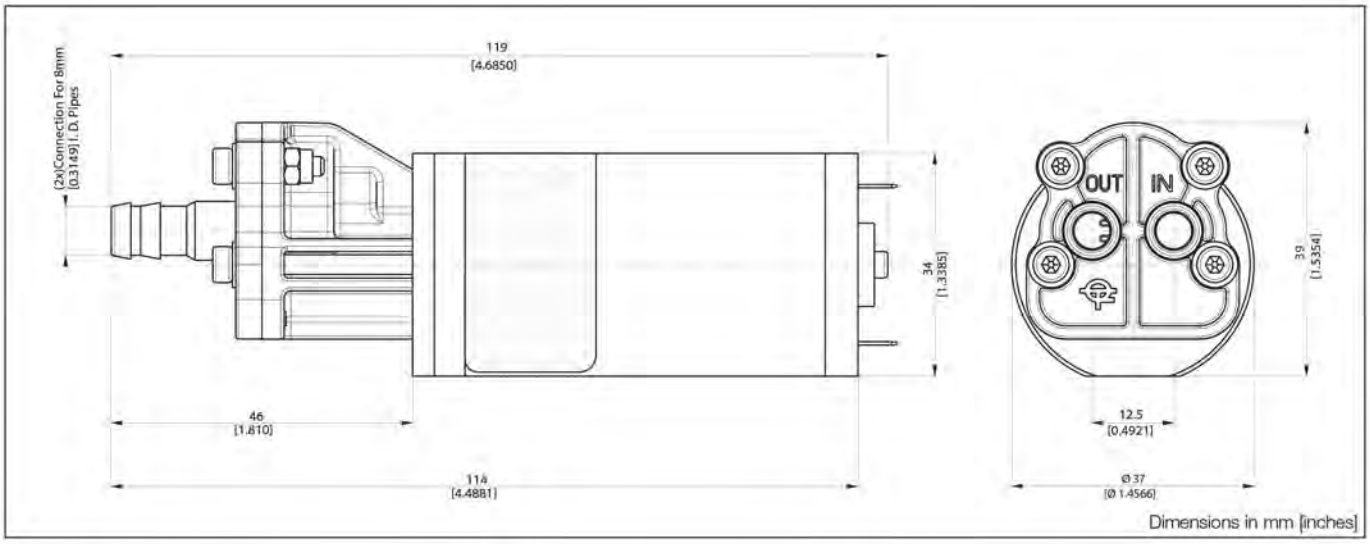
DIMENSIONS



ORDERING INFORMATION

MODEL NUMBER: ABCD

EXAMPLE: DGD09NA01

A Model	B Gear Width	C Seal Material	D Motor Type
DGD	09 (9 mm)	N = NBR V = VITON	A01 = 1400 rpm, 24 V A02 = 3200 rpm, 24 V A03 = 4000 rpm, 24 V A07=3980 rpm, 12 V

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MARCO

Series UP2 Gear Pumps for Water & Engine Oil

Water to 2.6 GPM, Oil to 52.9 GPH

DESCRIPTION

Model UP2/Oil and UP2/P are self-priming, compact, powerful, 12 or 24 VDC electric gear pumps. UP2/Oil is constructed of helical bronze gears, nickel-plated brass body and stainless steel shaft. UP2/P has PTFE gears.

Use UP2/Oil for transfer, circulation or drainage of lubricating oils and viscous liquids. Use UP2-P for fresh and salt water as well as for diesel fuel.

The E Option for UP2 is a built in pressure control whereby a factory programed pressure setting is maintaned via a built-in microprocessor based variable pump speed control circuit that utilizes an internal pressure sensor for loop feedback. Main application is low cost pressure/flow control for small water and process systems.

The UP2 measures a mere 4 3/8" in length and fits easily in the tightest of spaces.

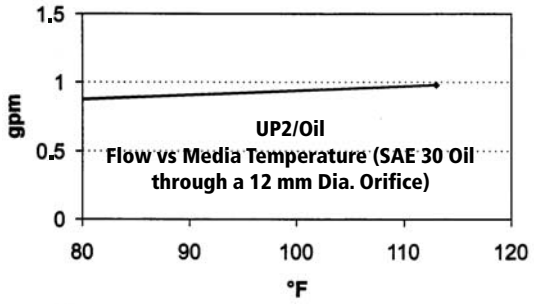
UP2/Oil & UP2-P

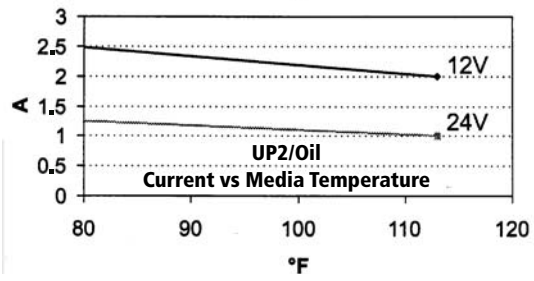
UP2/Oil & UP2-P With Pressure Control

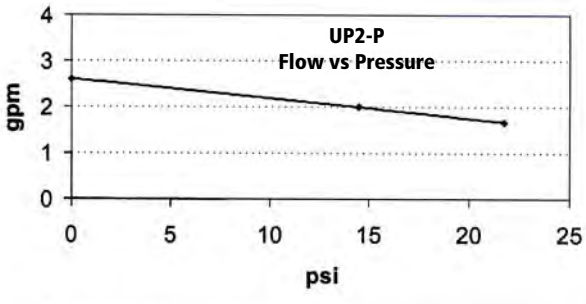
SPECIFICATIONS

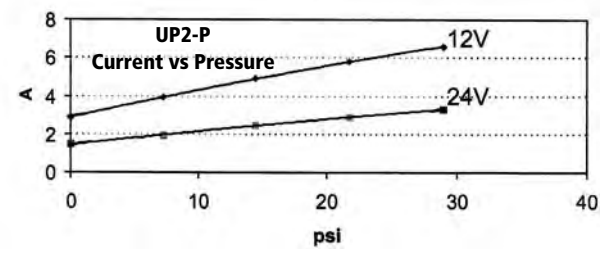
GENERAL

Ports: Tapped 3/8" BSP, pump supplied with 2 ea 3/8" NPT adaptors
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse
UP2/OIL- 12 V, 3A; 24 V, 1.5A
UP2/P- 12V, 5A; 24 V, 3A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 4.92 ft (1.5 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Nickel plated Brass
Gears: UP2/Oil, Bronze; UP2/P (PTFE)
Shaft: Stainless Steel
Suitable Fluid Media:
UP2/OIL: Fresh Water (max. 85°C, 185°F), engine oil & non-corrosive viscous liquids (max viscosity 85cSt), diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
UP2/P: Fresh water & sea water (max. 40°C, 104°F), diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
Unsuitable Fluid Media (UP2/Oil & UP2-P): DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, corrosive chemicals & solvents









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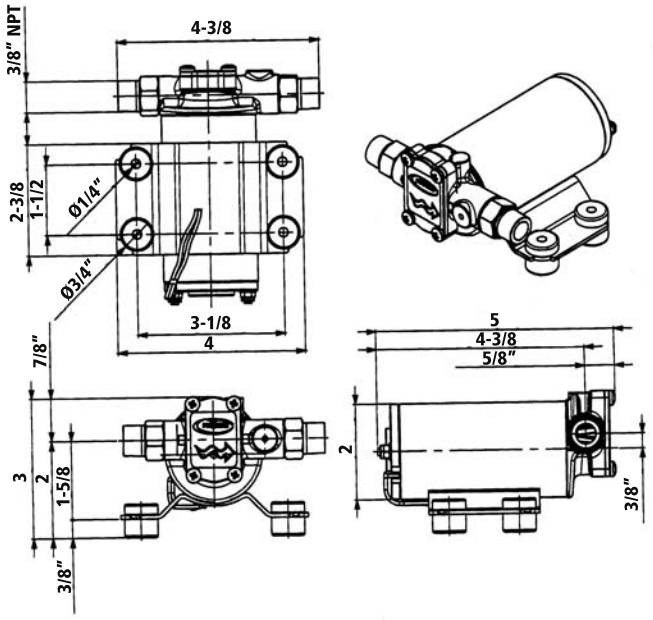
DIMENSIONS (INCHES)



ORDERING INFORMATION

ABC

Example: UP2/Oil24V

A Model	B Voltage	C Options
UP2/P UP2/Oil	12V= 12 VDC 24V= 24 VDC	- None E= Electronic Pressure Control, Specify Pressure Setpoint

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.

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MARCO

Series UP3 Gear Pumps for Water & Engine Oil

Water to 3.7 GPM, Oil to 1.5 GPM, Pressure to 29 PSI

DESCRIPTION

Model UP3/Oil, and UP3/P are self-priming, compact, powerful, 12 or 24 VDC electric gear pumps. UP3/Oil is constructed of helical bronze gears, nickel-plated brass body and stainless steel shaft. UP3/P has PTFE gears.

Use UP3/Oil for transfer, circulation or drainage of lubricating oils and viscous liquids. Use UP3/P for fresh and salt water as well as for diesel fuel.

The E Option for UP3 is a built in pressure control whereby a factory programed pressure setting is maintaned via a built-in microprocessor based variable pump speed control circuit that utilizes an internal pressure sensor for loop feedback. Main application is low cost pressure/flow control for small water and process systems.

The UP3 measures a mere 5 3/8" in length and fits easily in the tightest of spaces.

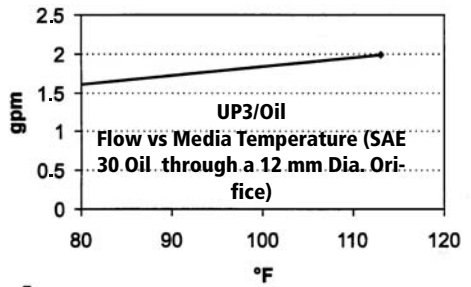
UP3/Oil & UP3/P

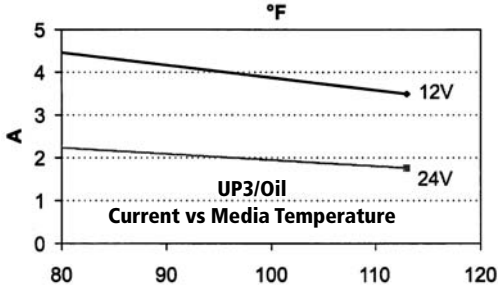
UP3/Oil & UP3/P With Pressure Control

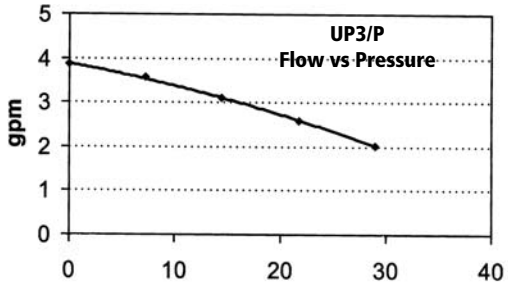
SPECIFICATIONS

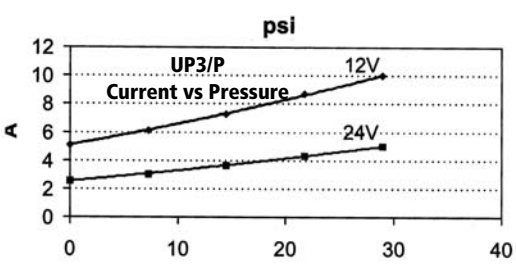
GENERAL

Ports: Tapped 3/8" BSP, pump supplied with 2 ea 3/8" NPT adaptors
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse
  UP3/OIL- 12 V, 7.3A or 24 V, 4A
  UP3/P- 12V, 10A or 24 V, 5A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 4.92 ft (1.5 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Nickel plated Brass
Gears: UP3/Oil, Bronze; UP3/P (PTFE)
Shaft: Stainless Steel
Suitable Fluid Media:
  UP3/OIL: Fresh Water (max. 85°C, 185°F), engine oil & non-corrosive viscous liquids (max viscosity 85cSt), diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
  UP3/P: Fresh water & sea water (max. 40°C, 104°F), diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
Unsuitable Fluid Media (UP3/Oil & UP3/P): DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, corrosive chemicals & solvents









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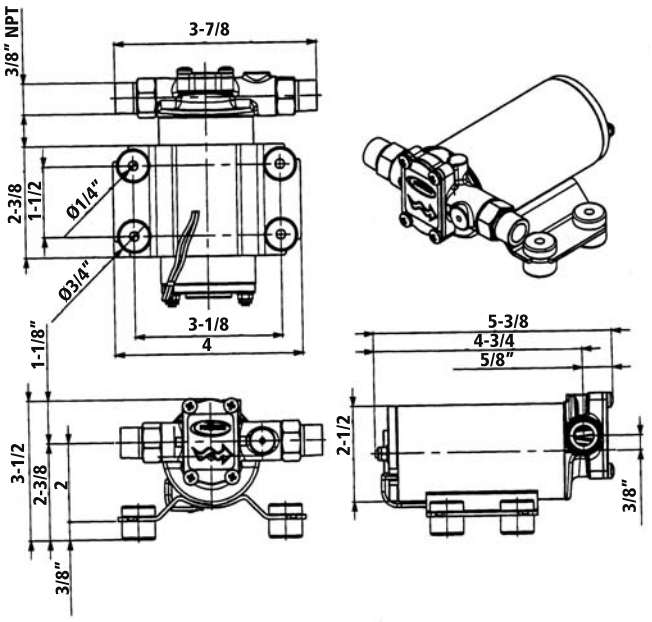
DIMENSIONS (INCHES)



ORDERING INFORMATION

MODEL PLUS OPTIONS

Example: UP3/Oil12VE

Model	Voltage	Options (Add Suffix to Model Number)
UP3/Oil	12V= 12 VDC 24V= 24 VDC	-= None E= Electronic Pressure Control, Specify Pressure Setpoint
UP3/P		

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.

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MARCO

Series UPX-C Stainless Steel Gear Pumps

Water to 3.7 GPM, Oil to 1.5 GPM, Pressure to 29 PSI

DESCRIPTION

Model series UPX-C are self-priming, compact, powerful, 12 or 24 VDC electric gear pumps. UPX-C is constructed of PTFE gears, stainless steel body and shaft.

Use UPX-C for transfer, circulation or drainage of fluids compatible with AISI316 stainless steel, PTFE and fluoroelastomer seals. UPX-C is resistant to most acid and alkaline solutions. Suitable also for transfer of battery acid.

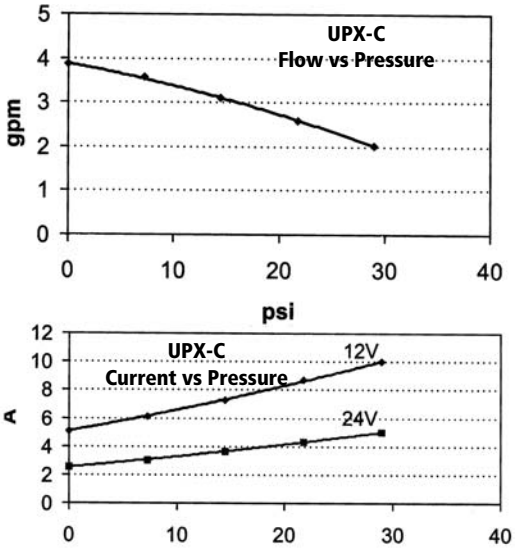
The UPX-C measures a mere 5 3/8" in length and fits easily in the tightest of spaces.

UPX-C

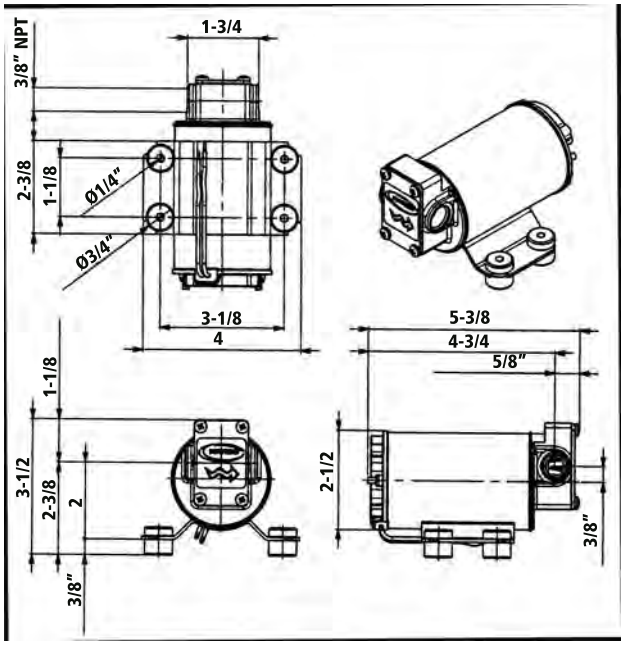
SPECIFICATIONS

GENERAL

Ports: Tapped 3/8" NPT
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse, 12 V, 10A; 24 V, 5A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 4.92 ft (1.5 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Ambient Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Stainless steel
Gears: (PTFE)
Shaft: AISI 316 Stainless Steel
Seal: Perfluoroelastomer
Suitable Fluid Media: Fresh water and fluids (max. 40°C, 104°F), which are compatible with stainless steel, PTFE and perfluoroelastomer seals.
Unsuitable Fluid Media (UP2/Oil & UP2-P): DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, media not compatible with wetted materials.



DIMENSIONS (INCHES)



ORDERING INFORMATION

Model	Voltage
UPX-C-12V	12 VDC
UPX-C-24V	24 VDC

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.

MARCO

Series UP9-PN Gear Pumps for Water & Diesel Fuel

12 or 24 VDC, Flow to 3.2 GPM, Pressure to 58 PSI

DESCRIPTION

Model UP9-PN is a self-priming, compact, powerful, 12 or 24 VDC electric gear pump. UP9-PM is constructed of PTFE gears, nickel-plated brass body and stainless steel shaft.

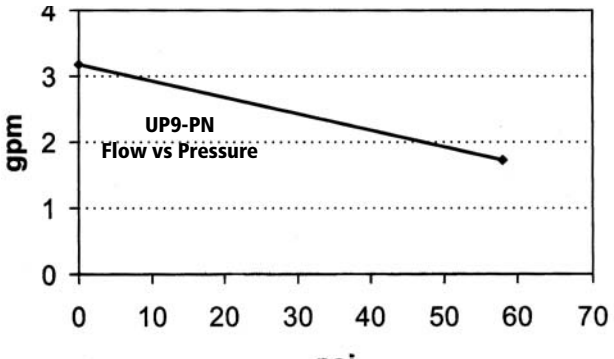
Use UP-9PN for fresh water, sea water, diesel fuel, transfer of lightweight lube oils, antifreeze and other compatible media.

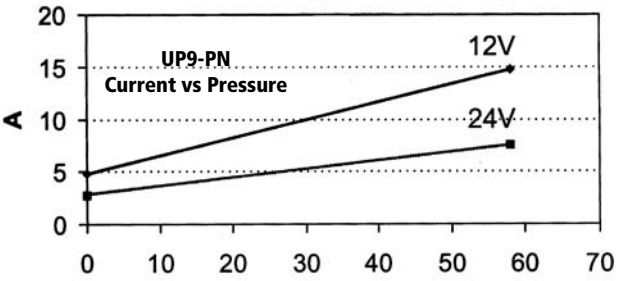
SPECIFICATIONS

GENERAL

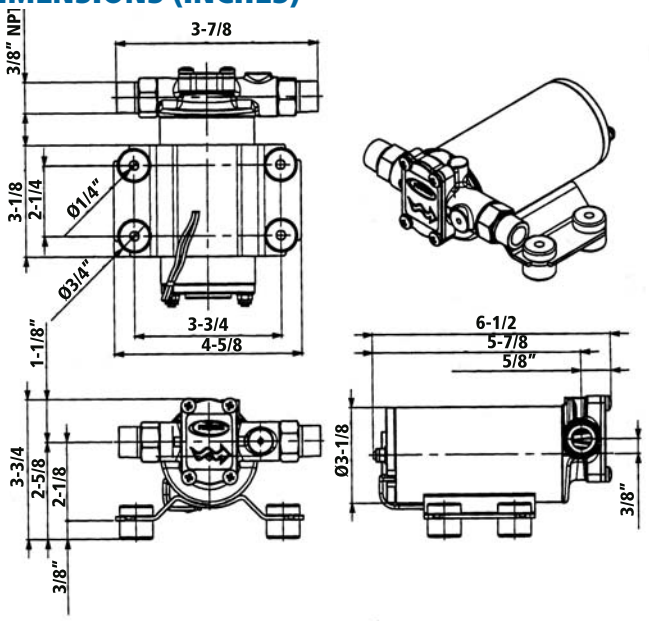
Ports: Tapped 3/8" BSP, pump supplied with 2 ea 3/8" NPT adaptors
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse12 V, 15A; 24 V, 10A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 4.92 ft (1.5 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Ambient Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Nickel plated Brass
Gears: UP9/Oil, Bronze; UP9/P (PTFE)
Shaft: Stainless Steel
*Suitable Fluid Media:
Fresh Water (max. 85°C, 185°F), salt water (max. 40°C, 104°F & diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
Unsuitable Fluid Media: DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, corrosive chemicals & solvents
Weight: 6 lbs

* A model with lower operating speed is available for lubricating oils and viscous liquids, consult factory.





DIMENSIONS (INCHES)



ORDERING INFORMATION

AB

Example: UP9-PN12V

A Model	B Voltage
UP9-PN	12V= 12 VDC 24V= 24 VDC

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.

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MARCO

Series UP6 Gear Pumps for Water & Diesel Fuel

12 or 24 VDC, Flow to 6.9 GPM, Pressure to 29 PSI

DESCRIPTION

Model UP6 is a self-priming, compact, powerful, 12 or 24 VDC electric gear pump. UP6 is constructed of helical bronze gears, nickel-plated brass body and stainless steel shaft.

Use UP6 for fresh water, diesel fuel and other compatible media.

The E Option for UP6 is a built in pressure control whereby a factory programed pressure setting is maintaned via a built-in microprocessor based variable pump speed control circuit that utilizes an internal pressure sensor for loop feedback. Main application is low cost pressure/flow control for small water and process systems.

UP6

UP6E

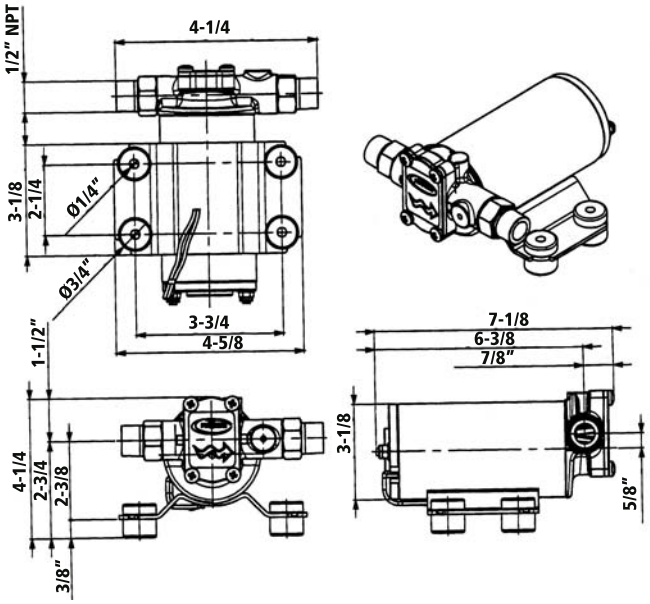
SPECIFICATIONS

GENERAL

Ports: Tapped 1/2" BSP, pump supplied with 2 ea 1/2" NPT adaptors
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse12 V, 15A; 24 V, 7.5A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 4.92 ft (1.5 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Nickel plated Brass
Gears: UP6/Oil, Bronze; UP6/P (PTFE)
Shaft: Stainless Steel
*Suitable Fluid Media:
Fresh Water (max. 85°C, 185°F) & diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; mini mum flashpoint (PM): 55°C, 131°F
Unsuitable Fluid Media: DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, corrosive chemicals & solvents

* A model with lower operating speed is available for lubricating oils and viscous liquids, consult factory.

DIMENSIONS (INCHES)



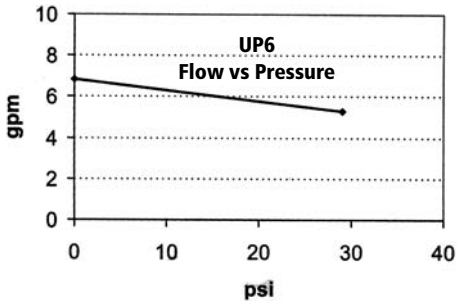
ORDERING INFORMATION

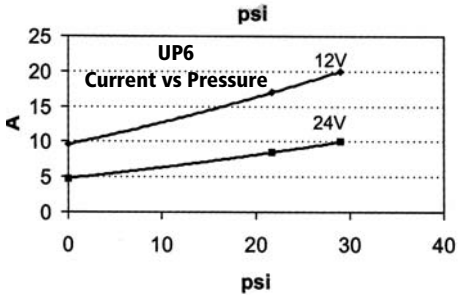
ABC

Example: UP612V

A Model	B Voltage	C Options
UP6	12V= 12 VDC 24V= 24 VDC	- None E= Electronic Pressure Control, Specify Pressure Setpoint

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.





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MARCO

Series UP12 Gear Pumps for Water & Diesel Fuel

12 or 24 VDC, Flow to 10.5 GPM, Pressure to 36 PSI

DESCRIPTION

Model UP12 is a self-priming, compact, powerful, 12 or 24 VDC electric gear pump. UP12 is constructed of helical bronze gears, nickel-plated brass body and stainless steel shaft.

Use UP12 for fresh water, diesel fuel and other compatible media.

The E Option for UP12 is a built in pressure control whereby a factory programed pressure setting is maintaned via a built-in microprocessor based variable pump speed control circuit that utilizes an internal pressure sensor for loop feedback. Main application is low cost pressure/flow control for small water and process systems.

UP12

UP12E

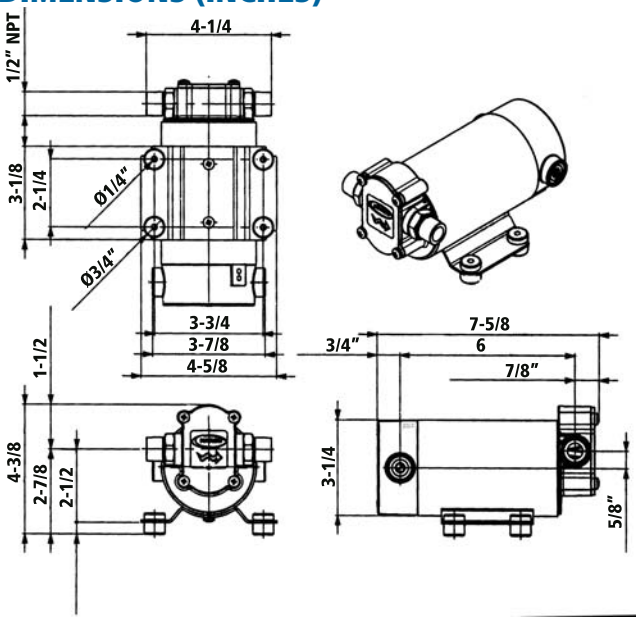
SPECIFICATIONS

GENERAL

Ports: Tapped 1/2" BSP, pump supplied with 2 ea 1/2" NPT adaptors
Motor: 12VDC or 24VDC, powdered epoxy coated
Circuit Protection: Install fuse12 V, 30A; 24 V, 15A
Current: See Curves
Flow Rate :See Curves
Self Priming With Wet Gears: 13.1 ft (4 m)
Pump Duty: Intermittant
Motor Life: Approx. 2000 hours
Max. Ambient Operating Temperature: 14-140°F (-10-60°C)
Max. Relative Humidity: 90%
Pump Body: Nickel plated Brass
Gears: UP12/Oil, Bronze; UP12/P (PTFE)
Shaft: Stainless Steel
*Suitable Fluid Media:
Fresh Water (max. 85°C, 185°F) & diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F
Unsuitable Fluid Media: DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, corrosive chemicals & solvents
Weight: 9.5 lbs

* A model with lower operating speed is available for lubricating oils and viscous liquids, consult factory.

DIMENSIONS (INCHES)



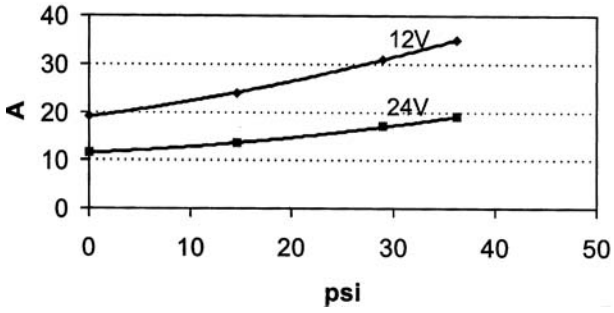
ORDERING INFORMATION

ABC

Example: UP1224V

A Model	B Voltage	C Options
UP12	12V= 12 VDC 24V= 24 VDC	- None E= Electronic Pressure Control, Specify Pressure Setpoint

Note: A 250-400 micron filter is recommended for applications where the fluid media containins particles.



UP12
Flow vs Pressure

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CLARK SOLUTIONS

Model 00 Rotary Gear Pump

Pressure to 300 PSI, Flow to 0.5 GPM, Drive Speed to 1800 RPM

DESCRIPTION

Model 00 pump is ideally suited for low volume applications such as pressure lubrication, hydraulic service, fuel supply, and general liquid transfer.

The pumps are available in cast iron and ductile iron. They are designed to operate at speeds to 1800 RPM, pressures to 300 PSI, and flow rates to 0.5 GPM. The standard seal is a lip seal and lubrication of the plain bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting.

These pumps have an outstanding record for reliable performance and long life. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") resulting in a pump with better lift, reduced slippage and longer service life.

Standard pumps operate to 250°F and, with modifications, to 500°F.

Model 00 Gear Pump

SPECIFICATIONS

GENERAL

Design: Drive speeds to 1800 RPM; discharge pressures to 300 PSI; flow rates to 0.5 GPM; foot or flange mounted
Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron.
Gears: Helical gears
Bearings: Plain bearings
Seal: Lip Seal
Lubrication: Self-lubricating using the pumped liquid.
Rotation: Clockwise or counter-clockwise, specify at time of order.
Liquid Viscosities: 32 SSU to 1750 SSU. Clean liquids having good lubricating quality. Adaptable for handling liquids of higher or lower viscosities.
Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.
Drive Options: A-Drive (pump connected to C-face motor with adapter bracket and coupling). D-Drive (pump coupled to motor mounted on baseplate.)
Accessories: Repair Kits, Gear Kits, and Seal Kits.

FEATURES

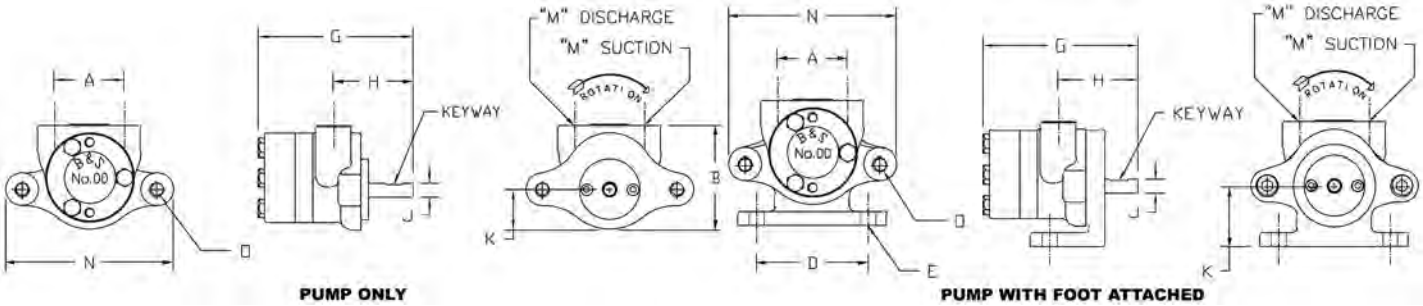
- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

- ***SEALS***

  Lip seal provides an ample safeguard against liquid leakage and the entrance of air.

PUMP DIMENSIONS (INCHES)



PUMP ONLY **PUMP WITH FOOT ATTACHED**

Table 1

Model	A	D	E	G	J	K	M	O	Keyway
00	1.888	3.00	0.41	4.19	0.38	1.63	0.375	3/8-16	Flat

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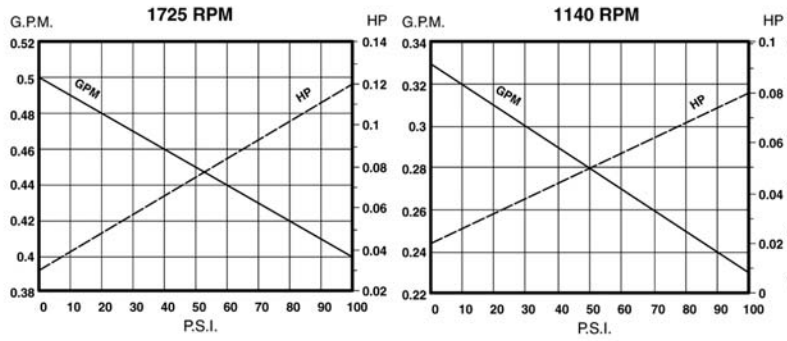
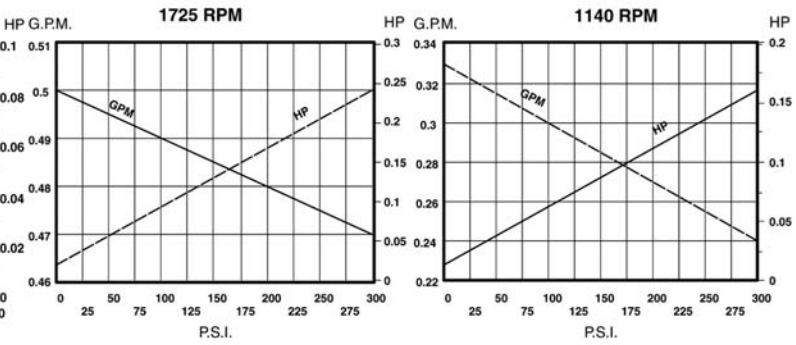
FLOW CURVES

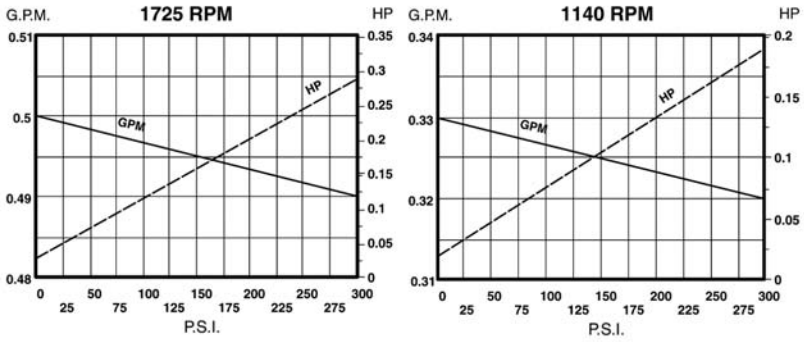
32 SSU LIQUID



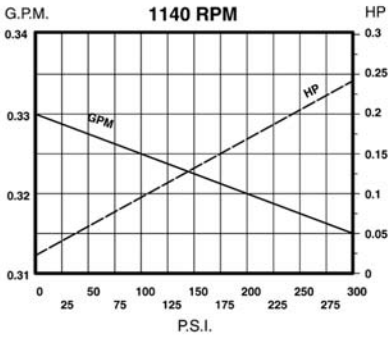
300 SSU LIQUID



1000 SSU LIQUID



1750 SSU LIQUID



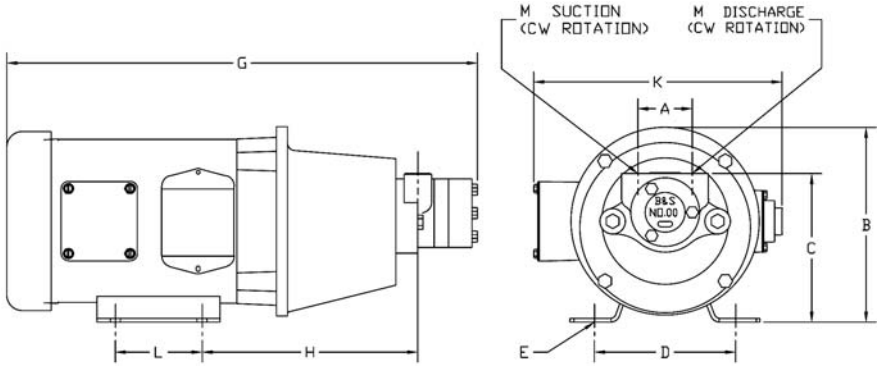
OPERATING CHARACTERISTICS

Delivery and horsepower are based on liquid viscosity of 300 SSU at speed and pressures shown.

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		100 PSI		200 PSI		300 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
00	0.00029	0.0003	1140	0.33	0.13	0.31	0.036	0.30	0.062	0.27	0.110	0.24	0.159
			1725	0.50	0.020	0.48	0.056	0.47	0.093	0.44	0.165	0.41	0.238

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR (A-DRIVE)

00 Series pumps are available direct coupled to a NEMA C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate.



Model	Motor Frame	A	B	C	D	E	G	H	K	L	M
00A	42C	1.88	4.94	4.06	3.50	0.28	13.13	5.38	4.63	1.69	3/8
	56C	1.88	7.09	5.16	4.88	0.34	18.13	7.44	8.81	3.00	3/8

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-C

A		B	C	D	E	F
Pump Model		Direction of Rotation	Options	Drive	Drive Assembly	Motor
Flange Mount 900= Model 00	**Foot Mount** 00= Model 00	2=Clockwise 3= Counter-clockwise	Opt 1= Ductile Iron	-= None 00A= A-Drive	- = Field Assembly A= Factory Assembly	Consult us

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B-Series, Models 1, 2, 3 & 4 Rotary Gear Pumps

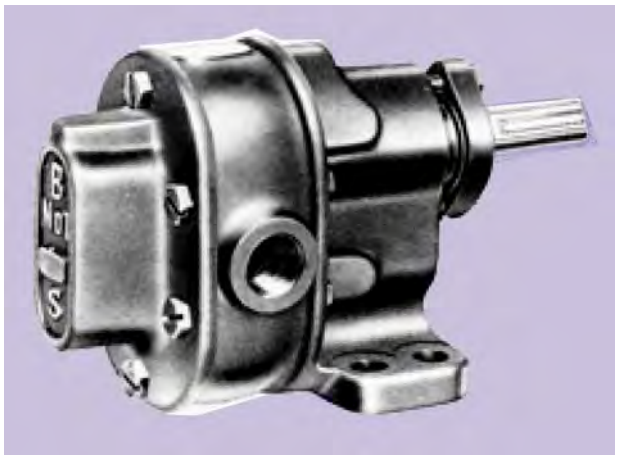
Particle Tolerant, Pressure to 200 PSI, Flow to 26.8 GPM, Drive Speed to 900 RPM

DESCRIPTION

Models 1, 2, 3 & 4 pumps are general purpose positive displacement gear pumps and are a good choice for a variety of recirculating, mixing and transfer applications.

The pumps are available in cast iron, ductile iron, and bronze. They are designed to operate at speeds to 900 RPM, pressures to 200 PSI, and flow rates to 26.8 GPM. The standard seal is a packing gland and lubrication of the replaceable sleeve bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting and with integral relief valves.

These pumps have an outstanding record for reliable performance and long life. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") This results in a pump with better lift, reduced slippage and longer service life. Further, the pumps are designed to be particle tolerant and will pass particles to 25 micron in size. Standard pumps operate to 250°F and, with modifications, to 500°F. Typical applications include abrasive materials, solvents, resins, and petroleum.



B Series Gear Pump

SPECIFICATIONS

GENERAL

Design: Drive speeds to 900 RPM; discharge pressures to 200 PSI; flow rates to 26.8 GPM; foot or flange mounted; with or without integral relief valve.

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron,Bronze and Carbon Steel.

Spur gears are rugged and accurately cut and are a favorite in machine hydraulic drives, lubrication and coolant applications as well as in many other industries, including textile, printing and plastic.

Gears: Models 1,2 & 3, spur gears; model 4, helical gears

Bearings: Replaceable iron sleeve bearings. Also available with carbon graphite or bronze bearings.

Seal: Compression packing with adjustable gland. Also available with self adjusting mechanical seal or lip seal. Mechanical seal and lip seals available with different elastomers.

Lubrication: Self-lubricating using the pumped liquid. Also available for handling non-lubricating liquids.

Rotation: Pumps may be operated in either direction. Discharge is always on the side of the pump toward which the top of the shaft rotates.

Liquid Viscosities: 32 ssu to 100,000 ssu. Adaptable for handling liquids from water soluble to molten lead.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Duty: Light, medium & intermittent service

Drive Options: A-Drive (pump connected to C-face motor with adapter bracket and coupling); D-Drive (pump coupled to motor mounted on base plate); GR-Drive (pump coupled to gear reducer coupled to motor mounted on baseplate); B-Drive (pump and motor connected by V-belt and pulleys mounted on baseplate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.

FEATURES

• PRECISION GROUND JOINTS

NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

• BEARINGS

The heart of the pump. Sleeve and plain bearings are especially adapted to maintain even gear and shaft rotation for normal pump service. Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

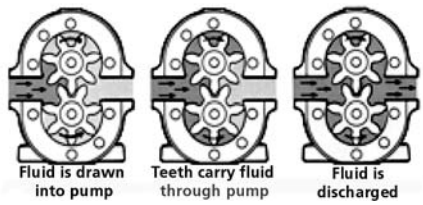
• SEALS

Compression packing provides an ample safeguard against liquid leakage and the entrance of air.

• PARTICLE TOLERANT

Low rotational speed and attention to gear tolerances allow particles to 25 microns to pass through pump.

PRINCIPLE OF OPERATION



OPERATING CHARACTERISTICS

SOLID LINE = GPM BROKEN LINE= HP

32 SSU LIQUID ***300 SSU LIQUID*** ***1,000 SSU LIQUID*** ***5,000 SSU LIQUID***

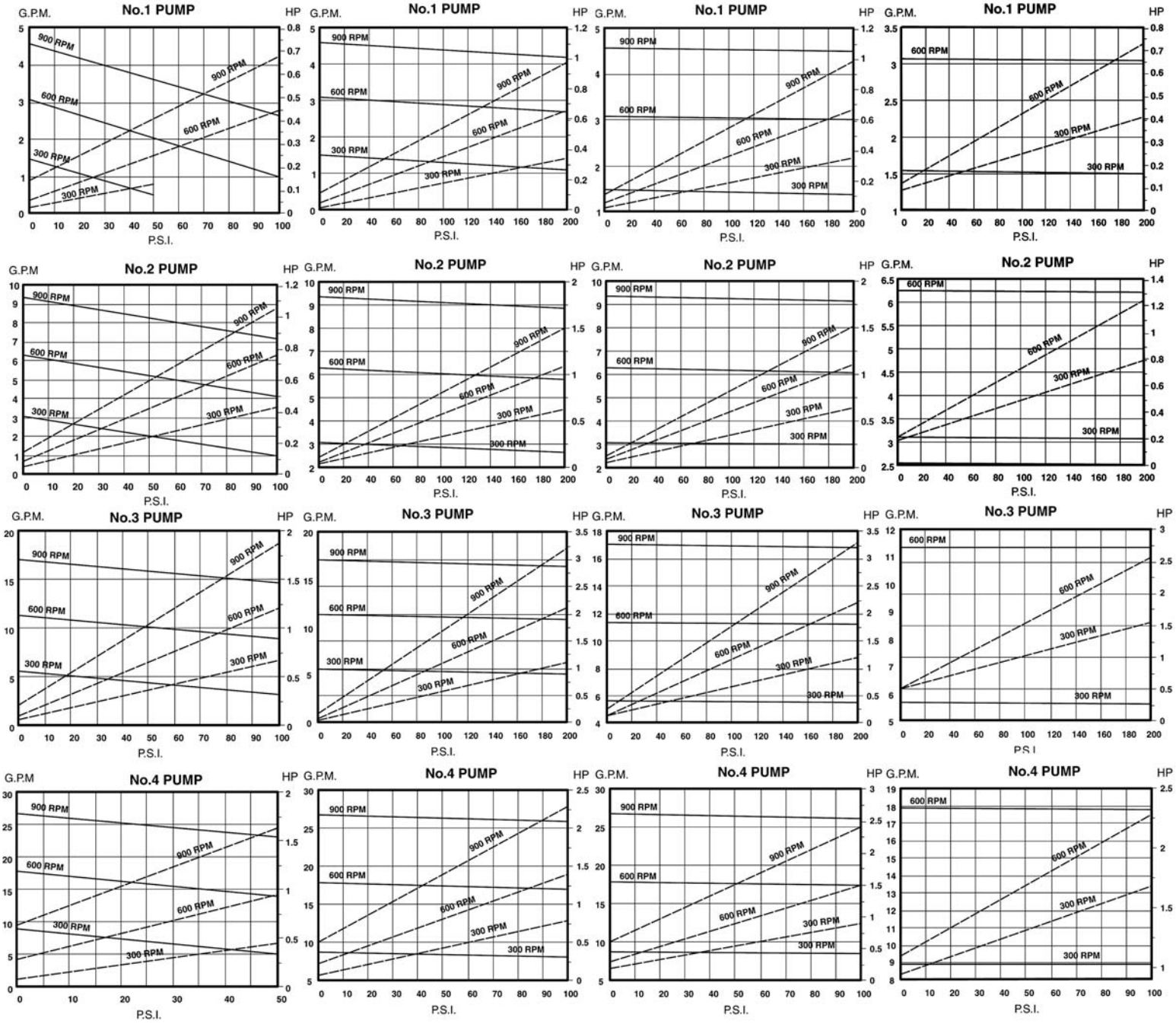


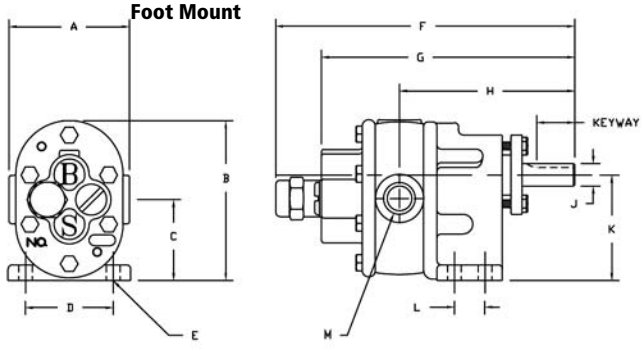
Table 1

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		75 PSI		100 PSI		200 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
1	0.00515	0.0022	300	1.5	0.02	1.4	0.10	1.38	0.14	1.3	0.18	1.1	0.34
			600	3.1	0.05	3.0	0.20	2.93	0.28	2.9	0.36	2.7	0.66
			900	4.6	0.11	4.5	0.33	4.47	0.35	4.4	0.54	4.2	0.98
2	0.01043	0.0023	300	3.1	0.04	3.0	0.19	2.95	0.26	2.9	0.34	2.7	0.64
			600	6.3	0.07	6.1	0.34	6.1	0.47	6.0	0.61	5.8	1.1
			900	9.4	0.11	9.3	0.48	9.2	0.66	9.1	0.85	8.9	1.5
3	0.01896	0.0025	300	5.7	0.05	5.6	0.28	5.5	0.41	5.4	0.54	5.2	1.1
			600	11.4	0.06	11.3	0.47	11.2	0.71	11.1	0.97	10.9	2.1
			900	17.1	0.17	17.0	0.83	16.8	1.2	16.8	1.5	16.5	3.2
4	0.02980	0.0080	300	8.9	0.07	8.5	0.37	8.3	0.57	8.1	0.80	-	-
			600	17.9	0.22	17.5	0.77	17.3	1.1	17.1	1.4	-	-
			900	26.8	0.50	26.4	1.3	26.2	1.7	26.0	2.3	-	-

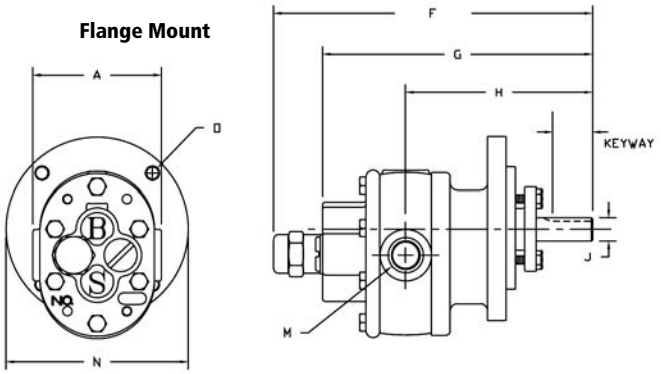
Delivery and horsepower are based on liquid viscosity if 300 SSU at speed and pressures shown.

PUMP DIMENSIONS (INCHES)

Foot Mount



Flange Mount



Note: Unit is dimensioned with optional integral relief valve (F dimension). The purpose of the relief valve is to relieve pressure in the pump when the discharge line is closed or otherwise obstructed. This is accomplished internally by routing the discharge back to the suction side of the pump when discharge pressure exceeds the set value. The relief valve is designed as a safety device and is not intended as a directional control valve nor is it intended for use under conditions calling for extended periods of by-pass. The relief valve should always be positioned on the discharge side of the pump. Placement on the suction side of the pump will render the pump inoperable.

Table 2

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Keyway
1	3.00	3.69	1.78	2.00	0.39	7.50	6.25	4.56	0.56	2.38	0.75	3/8" NPT	4 7/8	3/8-16	1/8 x 1/16
2	3.44	4.53	2.31	2.50	0.39	8.47	7.22	5.00	0.63	3.00	0.88	1/2" NPT	4 7/8	3/8-16	3/16 x 3/32
3	4.44	5.72	2.88	3.00	0.45	10.50	8.88	6.19	0.75	3.88	1.25	3/4" NPT	4 7/8	3/8-16	3/16 x 3/32
4	4.44	5.81	2.88	3.00	0.45	11.50	9.88	6.69	0.75	3.88	1.25	1 1/4" NPT	4 7/8	3/8-16	3/16 x 3/32

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR

B-Series pumps are available direct coupled to a NEMA C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate.

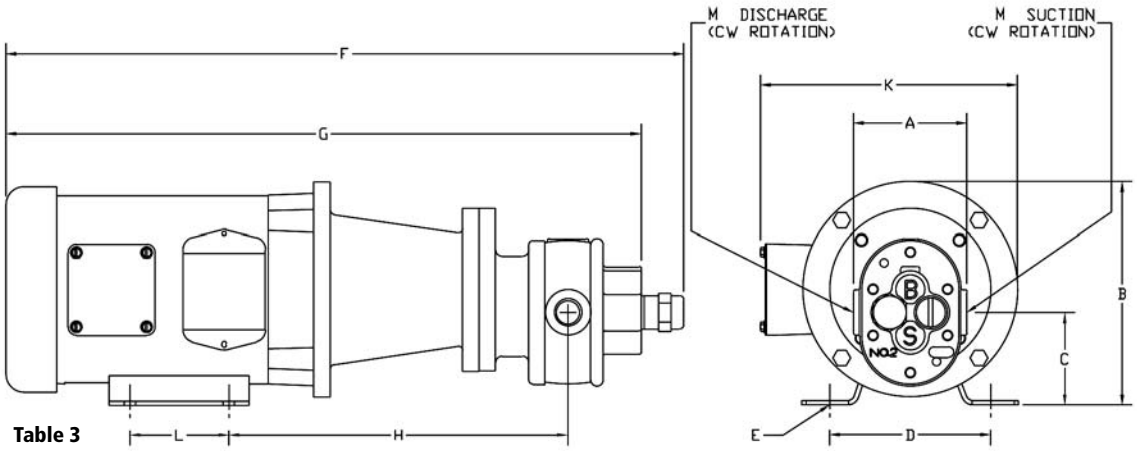


Table 3

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1A	56C	3.00	6.88	2.91	4.88	0.34	19.81	18.56	9.81	8.31	3.00	3/8
	145TC	3.00	6.88	2.91	5.50	0.34	21.53	20.28	10.12	8.56	5.00	3/8
	182TC	3.00	8.69	3.91	7.50	0.41	23.12	21.87	11.75	9.81	4.50	3/8
2A	56C	3.44	6.88	2.81	4.88	0.34	20.78	19.53	10.25	8.31	3.00	1/2
	145TC	3.44	6.88	2.81	5.50	0.34	22.50	21.25	10.56	8.56	5.00	1/2
	182TC	3.44	8.69	3.81	7.50	0.41	24.09	22.84	12.19	9.81	4.50	1/2
	184TC	3.44	8.69	3.81	7.50	0.41	25.09	23.84	12.19	9.81	5.50	1/2
3A	56C	4.44	6.88	2.50	4.88	0.34	22.82	21.19	11.43	8.31	3.00	3/4
	145TC	4.44	6.88	2.50	5.50	0.34	24.54	22.91	11.75	8.56	5.00	3/4
	182TC	4.44	8.69	3.50	7.50	0.41	26.13	24.50	13.37	9.81	4.50	3/4
	184TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.37	9.81	5.50	3/4
	213TC	4.44	10.25	4.25	8.50	0.41	29.04	27.41	14.25	12.16	5.50	3/4
	215TC	4.44	10.25	4.25	8.50	0.41	30.54	28.91	14.25	12.16	7.00	3/4
4A	145TC	4.44	6.88	2.50	5.50	0.34	25.54	23.91	12.25	8.56	5.00	1 1/4
	182TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.87	9.81	4.50	1 1/4
	184TC	4.44	8.69	3.50	7.50	0.41	28.13	26.50	13.87	9.81	5.50	1 1/4
	213TC	4.44	10.25	4.25	8.50	0.41	30.04	28.41	14.75	12.16	5.50	1 1/4
	215TC	4.44	10.25	4.25	8.50	0.41	31.54	29.91	14.75	12.16	7.00	1 1/4

PUMP DIMENSIONS (INCHES) BASE MOUNTED TO STANDARD FOOT MOUNTED MOTOR

B-Series pumps are available as base mounted pump and motor assemblies. This assembly, referred to as a D-Drive includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

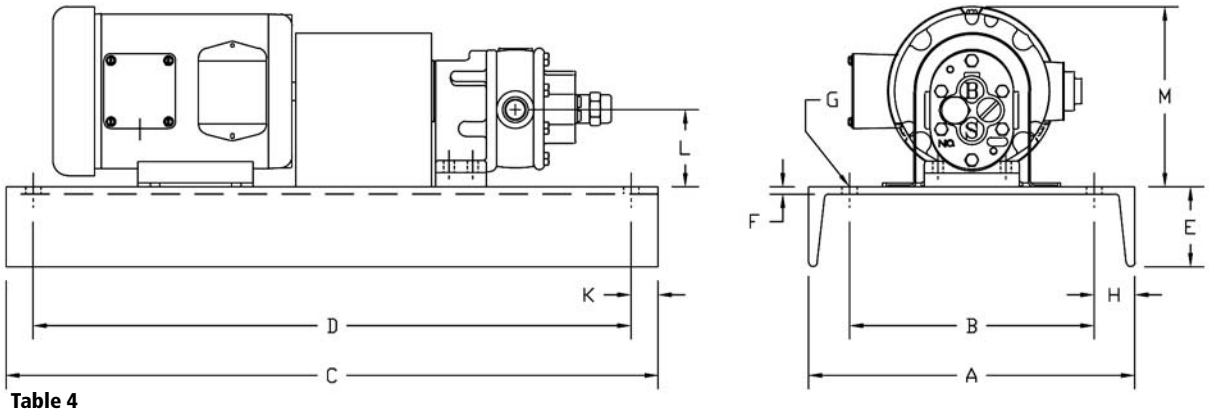


Table 4

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1D	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.91	8.69
2D	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.81	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.81	8.69
3D	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
4D	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B **ORDER PUMP & DRIVE 713-A-B-C** **ORDER PUMP,DRIVE & MOTOR 713-A-B-C-D-E**

Pump			Drive	Motor
A		B	C	D
Pump Model Select Flange or Foot Mount		**Grease Fitting Relief Valve**	**Pump/Motor Drive Assemblies**	***Standard C Frame Motors**
Flange Mount 901= Model 1 pump 902= Model 2 pump 903= Model 3 pump 904= Model 4 pump	**Foot Mount** 1= 1 2= 2 3= 3 4= 4	1= W/O Grease Fitting & Relief Valve 4= W/ Grease Fitting & W/O Relief Valve 7= W/O Grease Fitting & W/ Relief Valve 9= W/ Grease Fitting & Relief Valve	1) Select Model & Motor Frame From Tables 3 or 4 2) Choose Factory or Field Assembly. -=Field A=Factory Example: 2A-56CA	For "A" Drive Pumps A1= 860 RPM, 0.5 HP, 230/460 VAC, 3PH/ 60 Hz, 56C, TEFC A2= 860 RPM, 0.75 HP, 230/460 VAC, 3PH/ 60 Hz, 145TC, TEFC A3= 860 RPM, 1.00 HP, 230/460 VAC, 3PH/ 60 Hz, 182TC, TEFC A4= 860 RPM, 1.50 HP, 230/460 VAC, 3PH/ 60 Hz, 184TC, TEFC A5= 860 RPM, 2.0 HP, 230/460 VAC, 3PH/ 60 Hz, 213TC, TEFC A6= 860 RPM, 3.00 HP, 230/460 VAC, 3PH/ 60 Hz, 215TC, TEFC For "D" Drive Pumps B1= 850 RPM, 0.5 HP, 230/460 VAC, 3PH/ 60 Hz, 56C, TEFC B2= 850 RPM, 0.75 HP, 230/460 VAC, 3PH/ 60 Hz, 184, TEFC B3= 850 RPM, 1.00 HP, 230/460 VAC, 3PH/ 60 Hz, 182T, TEFC B4= 850 RPM, 1.50 HP, 230/460 VAC, 3PH/ 60 Hz, 184T, TEFC B5= 850 RPM, 2.00 HP, 230/460 VAC, 3PH/ 60 Hz, 213T, TEFC B6= 850 RPM, 3.00 HP, 230/460 VAC, 3PH/ 60 Hz, 215T, TEFC *Call us with your motor requirements, many other electrics, enclosures & drives are available

E- Options	
Opt 1= Ductile Iron Casing	Opt 4=Mechanical Seal
Opt 2= Carbon Steel Casing	Opt 5= Teflon Compression Packing
*Opt 3= Bronze Casing	Opt 6= Carbon Graphite Bearings
*Reduced suction lift, 15" Hg/17 feet depending on type of liquid being pumped	

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CLARK SOLUTIONS

S Series Rotary Gear Pump

Pressure to 200 PSI, Flow to 32 GPM, Drive Speed to 1800 RPM

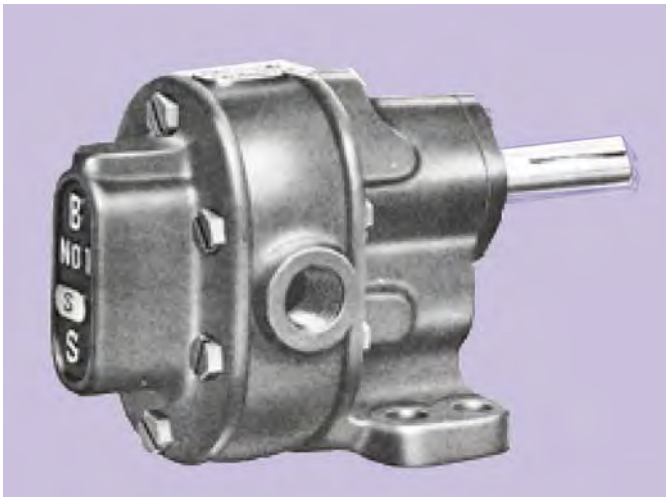
DESCRIPTION

Series S pumps are general purpose positive displacement gear pumps and are a good choice for a variety of recirculating, mixing and transfer applications.

The pumps are available in cast iron, ductile iron, 316 SS and bronze. They are designed to operate at speeds to 1800 RPM, pressures to 200 PSI, and flow rates to 32 GPM. The standard seal is a mechanical self adjusting seal with Buna-N elastomer. Lubrication of the replaceable iron sleeve bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting and with integral relief valves.

These pumps are self-priming and uni-directional. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") This results in a pump with better lift, reduced slippage and longer service life. Standard pumps operate to 250°F and, with modifications, to 500°F.

Helical gears provide very smooth and quiet operation at direct motor speeds in hydraulic, lubrication and transfer applications, in oil field service as well as almost every other industry classification.



S Series Gear Pump

SPECIFICATIONS

GENERAL

Design: Drive speeds to 1800 RPM; discharge pressures to 200 PSI; flow rates to 32 GPM; foot or flange mounted; with or without integral relief valve.

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron, 316 Stainless Steel and Carbon Steel.

Gears: helical gears

Bearings: Replaceable iron sleeve bearings. Also available with carbon graphite or bronze bearings.

Seal: Self adjusting mechanical seal. Also available with compression packing or lip seal. Mechanical seal and lip seals avilable with different elastomers for pumping different types of liquids.

Lubrication: Self-lubricating using the pumped liquid. Also available for handling non-lubricating liquids.

Rotation: Pumps may be operated in either direction. Discharge is always on the side of the pump toward which the top of the shaft rotates. Specify when ordering.

Liquid Viscosities: 32 SSU to 100,000 SSU. Adaptable for handling liquids from water soluble to molten lead.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Drive Options: E-Drive (pump close coupled to motor); A-Drive (pump connected to C-face motor with adapter bracket and coupling); D-Drive (pump coupled to motor mounted on base plate); GR-Drive (pump coupled to gear reducer coupled to motor mounted on baseplate); B-Drive (pump and motor connected by V-belt and pulleys mounted on base plate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.

FEATURES

- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent perform ance and the time once lost in halting operations to replace a worn gasket is saved.

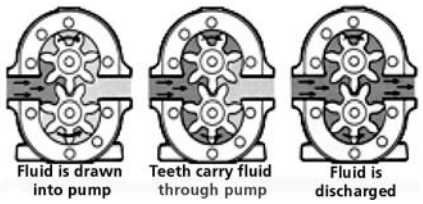
- ***BEARINGS***

  The heart of the pump. Sleeve and plain bearings are especially adapted to maintain even gear and shaft rotation for normal pump service. Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

- ***SEALS***

  Self-adjusting mechanical seals provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



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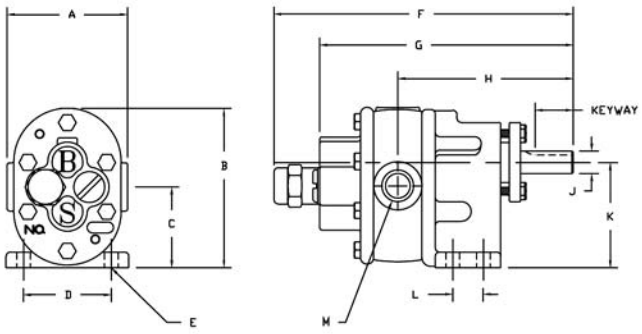
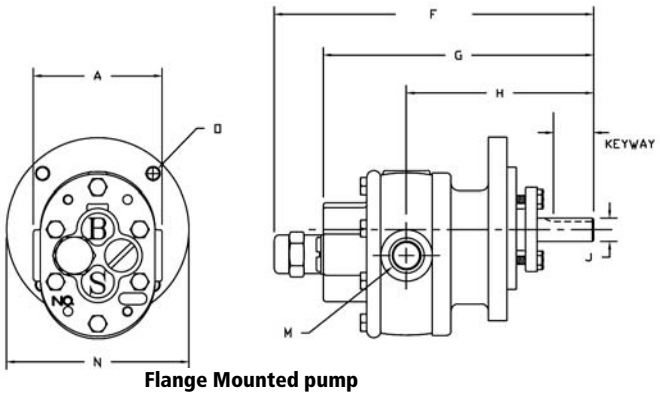
PUMP DIMENSIONS (INCHES)



Foot Mounted pump



Flange Mounted pump

Note: Unit is dimensioned with optional integral relief valve (F dimension). The purpose of the relief valve is to relieve pressure in the pump when the discharge line is closed or otherwise obstructed. This is accomplished internally by routing the discharge back to the suction side of the pump when discharge pressure exceeds the set value. The relief valve is designed as a safety device and is not intended as a directional control valve nor is it intended for use under conditions calling for extended periods of by-pass. The relief valve should always be positioned on the discharge side of the pump. Placement on the suction side of the pump will render the pump inoperable.

Table 1

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Keyway
1S	3.00	3.69	1.78	2.00	0.39	7.50	6.25	4.56	0.56	2.38	0.75	3/8" NPT	4 7/8	3/8-16	1/8 x 1/16
2S	3.44	4.53	2.31	2.50	0.39	8.47	7.22	5.00	0.68	3.00	0.88	1/2" NPT	4 7/8	3/8-16	3/16 x 3/32
3S	4.44	5.72	2.88	3.00	0.45	10.50	8.88	6.19	0.75	3.88	1.25	3/4" NPT	4 7/8	3/8-16	3/16 x 3/32
4S	4.44	5.91	2.88	3.00	0.45	10.50	8.88	6.19	0.75	3.88	1.25	1" NPT	4 7/8	3/8-16	3/16 x 3/32
5S	5.00	5.97	2.88	3.00	0.45	10.50	8.88	6.69	0.75	3.88	1.25	1 1/4" NPT	4 7/8	3/8-16	3/16 X 3/32

OPERATING CHARACTERISTICS

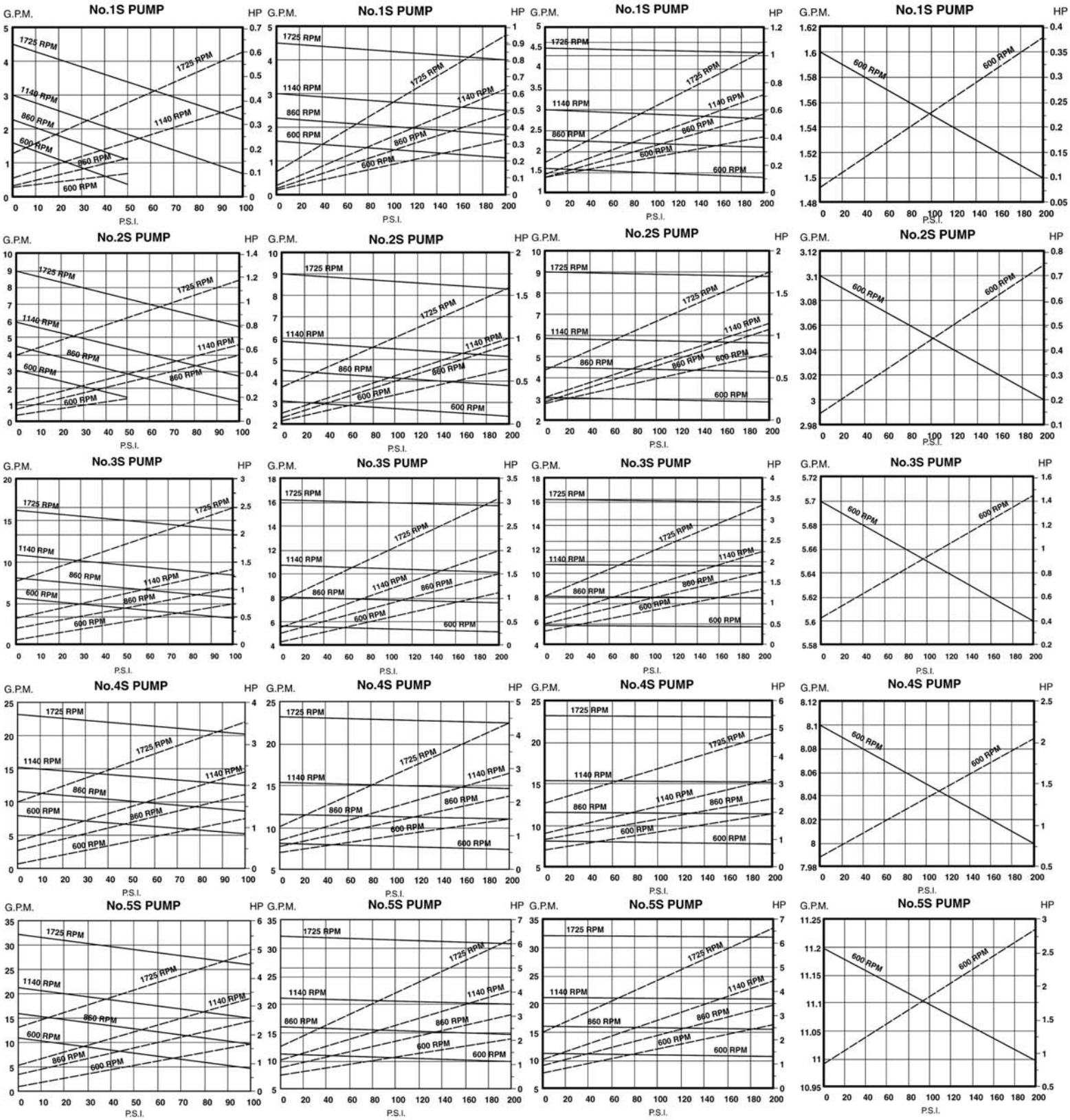
Table 2

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		75 PSI		100 PSI		14.018.5200 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
1S	0.00262	0.0024	600	1.6	0.03	1.5	0.08	1.4	0.11	1.3	0.15	1.1	0.33
			860	2.3	0.04	2.1	0.13	2.07	0.18	2.0	0.23	1.8	0.49
			1140	3.0	0.06	2.9	0.17	2.8	0.23	2.7	0.30	2.5	0.63
			1725	4.5	0.14	4.4	0.29	4.3	0.36	4.28	0.48	4.0	0.95
2S	0.00521	0.0035	600	3.1	0.05	3.0	0.15	2.9	0.24	2.8	0.31	2.4	0.65
			860	4.5	0.08	4.3	0.22	4.2	0.34	4.1	0.45	3.8	0.93
			1140	5.9	0.13	5.8	0.31	5.7	0.41	5.6	0.51	5.2	1.00
			1725	9.0	0.44	8.8	0.64	8.7	0.78	8.6	0.94	8.3	1.60
3S	0.00947	0.0026	600	5.7	0.08	5.6	0.34	5.5	0.47	5.4	0.60	5.2	1.10
			860	8.1	0.25	8.0	0.54	7.9	0.68	7.8	0.83	7.6	1.50
			1140	10.8	0.38	10.7	0.77	10.6	0.97	10.5	1.10	10.2	2.00
			1725	16.2	0.92	16.1	1.40	16.0	1.7	15.9	2.00	15.7	3.10
4S	0.0135	0.009	600	8.1	0.30	7.9	0.50	7.8	0.6	7.7	0.80	7.4	1.20
			860	11.6	0.40	11.3	0.70	11.2	0.9	11.1	1.10	10.7	1.80
			1140	15.3	0.50	15.0	0.90	14.8	1.2	14.7	1.45	14.2	2.30
			1725	23.2	0.80	22.7	1.40	22.5	1.8	22.3	2.20	21.4	3.50
5S	0.0186	0.02	600	11.1	0.45	10.8	0.55	10.6	0.75	10.4	0.95	9.7	1.60
			860	15.9	0.65	15.5	0.80	15.2	1.0	15.0	1.30	14.0	2.30
			1140	21.1	0.80	20.5	1.10	20.2	1.4	19.8	1.80	18.5	3.10
			1725	32.0	1.30	31.0	1.60	30.5	2.1	30.0	2.70	28.0	4.70

Delivery and horsepower are based on liquid viscosity if 300 SSU at speed and pressures shown.

SOLID LINE = GPM BROKEN LINE= HP

32 SSU LIQUID	***300 SSU LIQUID***	***1,000 SSU LIQUID***	***5,000 SSU LIQUID***



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PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR

S-Series pumps are available direct coupled to a Nema C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate.

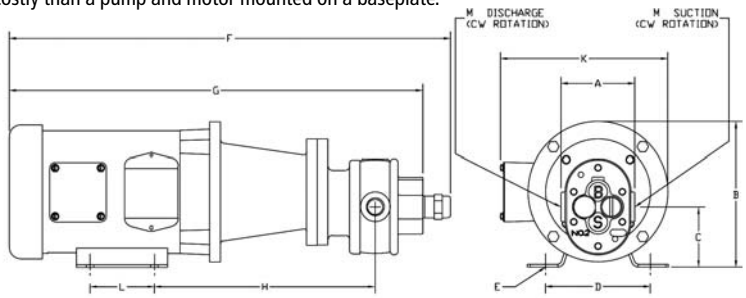


Table 3

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SA	56C	3.00	6.88	2.91	4.88	0.34	19.81	18.56	9.81	8.31	3.00	3/8
	145TC	3.00	6.88	2.91	5.50	0.34	21.53	20.28	10.12	8.56	5.00	3/8
	182TC	3.00	8.69	3.91	7.50	0.41	23.12	21.87	11.75	9.81	4.50	3/8
2SA	56C	3.44	6.88	2.81	4.88	0.34	20.78	19.53	10.25	8.31	3.00	1/2
	145TC	3.44	6.88	2.81	5.50	0.34	22.50	21.25	10.56	8.56	5.00	1/2
	182TC	3.44	8.69	3.81	7.50	0.41	24.09	22.84	12.19	9.81	4.50	1/2
	184TC	3.44	8.69	3.81	7.50	0.41	25.09	23.84	12.19	9.81	5.50	1/2
3SA	56C	4.44	6.88	2.50	4.88	0.34	22.82	21.19	11.43	8.31	3.00	3/4
	145TC	4.44	6.88	2.50	5.50	0.34	24.54	22.91	11.75	8.56	5.00	3/4
	182TC	4.44	8.69	3.50	7.50	0.41	26.13	24.50	13.37	9.81	4.50	3/4
	184TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.37	9.81	5.50	3/4
	213TC	4.44	10.25	4.25	8.50	0.41	29.04	27.41	14.25	12.16	5.50	3/4
	215TC	4.44	10.25	4.25	8.50	0.41	30.54	28.91	14.25	12.16	7.00	3/4
4SA	56C	4.44	6.88	2.50	4.88	0.34	22.82	21.19	11.43	8.31	3.00	1
	145TC	4.44	6.88	2.50	5.50	0.34	24.54	22.91	11.75	8.56	5.00	1
	182TC	4.44	8.69	3.50	7.50	0.41	26.13	24.50	13.37	9.81	4.50	1
	184TC	4.44	8.69	3.50	7.50	0.41	27.13	25.50	13.37	9.81	5.50	1
	213TC	4.44	10.25	4.25	8.50	0.41	29.04	27.41	14.25	12.16	5.50	1
	215TC	4.44	10.25	4.25	8.50	0.41	30.54	28.91	14.25	12.16	7.00	1
5SA	56C	5.00	6.88	2.50	4.88	0.34	23.20	21.57	11.63	8.31	3.00	1 1/4
	145TC	5.00	6.88	2.50	5.50	0.34	24.92	23.29	11.95	8.56	5.00	1 1/4
	182TC	5.00	8.69	3.50	7.50	0.41	26.51	24.88	13.57	9.81	4.50	1 1/4
	184TC	5.00	8.69	3.50	7.50	0.41	27.51	25.88	13.57	9.81	5.50	1 1/4
	213TC	5.00	10.25	4.25	8.50	0.41	29.42	27.79	14.45	12.16	5.50	1 1/4
	215TC	5.00	10.25	4.25	8.50	0.41	30.92	29.29	14.45	12.16	7.00	1 1/4
	254TC	5.00	12.88	5.25	10.00	0.53	37.26	35.63	16.19	16.09	8.25	1 1/4

PUMP DIMENSIONS (INCHES) BASE MOUNTED TO STANDARD FOOT MOUNTED MOTOR

S-Series pumps are available as base mounted pump and motor assemblies. Each assembly includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

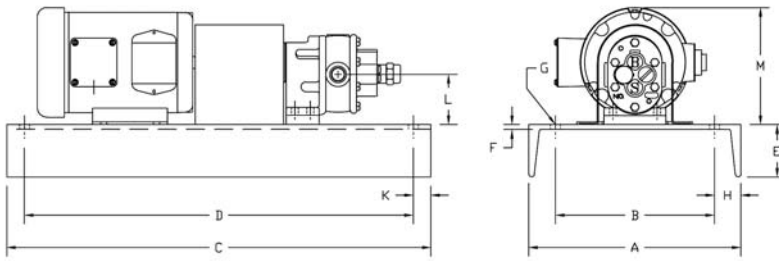


Table 4

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.91	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.91	8.69
2SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.81	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.81	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.81	8.69
3SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
4SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
5SD	56C	12.00	9.00	24.00	22.00	2.94	0.28	0.263	2.00	1.00	2.50	6.88
	145TC	12.00	9.00	26.00	24.00	2.94	0.28	0.85	1.50	1.00	2.50	6.88
	182TC	12.00	9.00	30.00	28.00	3.41	0.28	0.56	1.50	1.00	3.50	8.69
	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213TC	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	254TC	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.25	12.88

PUMP DIMENSIONS (INCHES) CLOSE COUPLED MOTOR (E-DRIVE)

S-Series pumps are available direct coupled to the end bell of a foot mounted motor. This assembly, referred to as anE-Drive, ensures accurate alignment and requires less space than a pump connected to the C-Face of a motor.

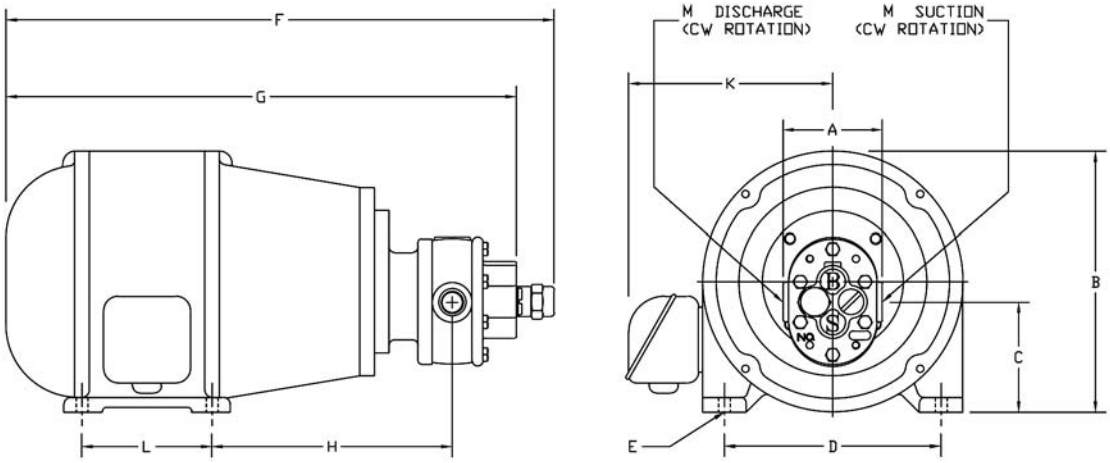


Table 5

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
1SE	182	3.00	9.00	3.90	7.50	0.406	17.94	16.69	7.88	7.06	4.50	3/8
2SE	182	3.44	9.00	3.81	7.50	0.406	18.91	17.66	8.31	7.06	4.50	1/2
	184	3.44	9.00	3.81	7.50	0.406	19.91	18.66	8.31	7.06	5.50	1/2
	213	3.44	10.38	4.56	8.50	0.406	21.47	20.22	9.12	7.94	5.50	1/2
3SE	182	4.44	9.00	3.50	7.50	0.406	20.94	19.31	9.50	7.06	4.50	3/4
	184	4.44	9.00	3.50	7.50	0.406	21.94	20.31	9.50	7.06	5.50	3/4
	213	4.44	10.38	4.25	8.50	0.406	23.50	21.88	10.31	7.94	5.50	3/4
	215	4.44	10.38	4.25	8.50	0.406	24.00	22.38	10.31	7.94	7.00	3/4
4SE	182	4.44	9.00	3.50	7.50	0.406	20.94	19.31	9.50	7.06	4.50	1
	184	4.44	9.00	3.50	7.50	0.406	21.94	20.31	9.50	7.06	5.50	1
	213	4.44	10.38	4.25	8.50	0.406	23.54	21.88	10.31	7.94	5.50	1
	215	4.44	10.38	4.25	8.50	0.406	24.00	22.38	10.31	7.94	7.00	1
	254U	4.44	12.38	5.25	6.03	0.406	26.19	24.56	12.49	9.81	8.25	1
5SE	182	5.00	9.00	3.47	7.50	0.406	21.94	20.31	10.00	7.06	4.50	1 1/4
	184	5.00	9.00	3.47	7.50	0.406	22.94	21.31	10.00	7.06	5.50	1 1/4
	213	5.00	10.38	4.22	8.50	0.406	24.50	22.88	10.81	7.94	5.50	1 1/4
	215	5.00	10.38	4.22	8.50	0.406	25.00	23.38	10.81	7.94	7.00	1 1/4
	254U	5.00	12.38	5.22	6.03	0.406	27.19	25.56	12.99	9.81	8.25	1 1/4

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E

ORDER PUMP & DRIVE 713-A-B-C-D-E

Pump			Drive	Assembly
A		B	C	D
Pump Model		Turning Direction Relief Valve	Pump Drive/Bracket	Assembly: Pump & Bracket
910= Flange Mount Model 1S	10= Foot Mount Model 1S	2= CW Without Relief Valve	Select Model & Motor Frame From Tables 3 ,4 or 5	A= Factory Assembly
920=Flange Mount Model 2S	20= Foot Mount Model 2S	3= CCW Without Relief Valve		B= Field Assembly
930=Flange Mount Model 3S	33= Foot Mount Model 3S	7= CW With Relief Valve	Example: 3SA-182TC	
940=Flange Mount Model 4S	40= Foot Mount Model 4S	8=CCW With Relief Valve		
950=Flange Mount Model 5S	50=Foot Mount Model 5S			

E- Options	
Opt 1= Ductile Iron Casing	Opt 5=Mechanical Seal
Opt 2= Carbon Steel Casing	Opt 6= Teflon Compression Packing
*Opt 3= 316 Stainless Steel Casing & 17-4 SS Gears	Opt 4= Carbon Graphite Bearings
*some variations in HP requirements exist for this option, please consult us	

Complete Pump, Drive & Motor Combiations

Our most popular complete assemblies are listed below & typically available from stock.

Order #	Model	Description	GPM	Max. Visc(SSU)	Max PSIG
713-91043-4992	1SA	Relief valve, 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	4.5	1000	100
713-92043-4882	2SA	Relief valve, 1/2 HP-1140 RPM, 230/460-3/60-56FR-TEFC	5.9	2000	100
713-92045-4992	3SA	Relief valve, 1 HP-1725 RPM, 230/460-3/60-56FR-TEFC	9.0	1000	100
713-93045-4992	4SA	Relief valve, 1 HP-1725 RPM, 230/460-3/60-145FR-TEFC	10.8	2000	100
713-93046-4992	5SA	Relief valve, 1 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	16.2	1000	60
713-94047-4992	4SA	Relief valve, 2 HP-1725 RPM, 230/460-3/60-145TC FR-TEFC	23.2	1000	75
713-95048-4992	5SA	Relief valve, 1/2 HP-1725 RPM, 230/460-3/60-56FR-TEFC	35	1000	75

Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.

CLARK SOLUTIONS

Heavy Duty S Series Rotary Gear Pump

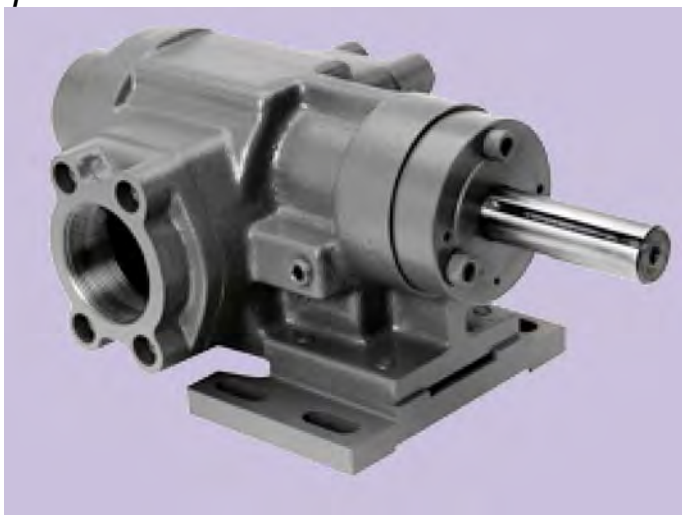
Pressure to 300 PSI, Flow to 175 GPM, Drive Speed to 1800 RPM

DESCRIPTION

Heavy Duty S Series pumps are capable of higher pressures and flow rates than the standard S-Series.

The pumps are available in cast iron(standard) and ductile iron. They are designed to operate at speeds to 1140 RPM, pressures to 300 PSI, and flow rates to 175 GPM. The standard seal is a mechanical self adjusting seal with Buna-N elastomer. Lubrication of the anti-friction bearings is accomplished by the circulation of the pumped liquid. All models are available with foot mounting.

These pumps are self-priming and uni-directional. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") resulting in a pump with better lift, reduced slippage and longer service life. Standard pumps operate to 250°F and, with modifications, to 500°F.



Foot Mounted Pump

Helical gears provide very smooth and quiet operation at direct motor speeds in hydraulic, lubrication and transfer applications in almost every industry classification.

SPECIFICATIONS

GENERAL

Design: Drive speeds to 1140 RPM; discharge pressures to 300 PSI; flow rates to 175 GPM; foot mounted
Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron.
Gears: Helical gears
Bearings: Anti-friction. Also available with iron or carbon graphite sleeve bearings.
Seal: Self adjusting mechanical seal with Buna-N elastomer. Also available with compression packing. Mechanical seal available with different elastomers for pumping different types of liquids.
Lubrication: Self-lubricating using the pumped liquid. Also available for handling non-lubricating liquids.
Rotation: Clockwise or counter-clockwise rotation. A reversible back drain permits direction of rotation to be easily changed in the field.
Liquid Viscosities: 100 SSU to 100,000 SSU. Adaptable for handling liquids of higher or lower viscosities.
Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.
Drive Options: D-Drive (pump coupled to motor mounted on base plate); GR-Drive (pump coupled to gear reducer coupled to motor mounted on baseplate); B-Drive (pump and motor connected by V-belt and pulleys mounted on baseplate).
Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.

FEATURES

- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

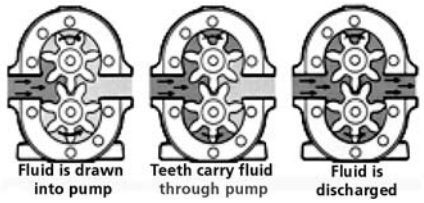
- ***BEARINGS***

  Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

- ***SEALS***

  Self-adjusting mechanical seals provide an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



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PUMP DIMENSIONS (INCHES)

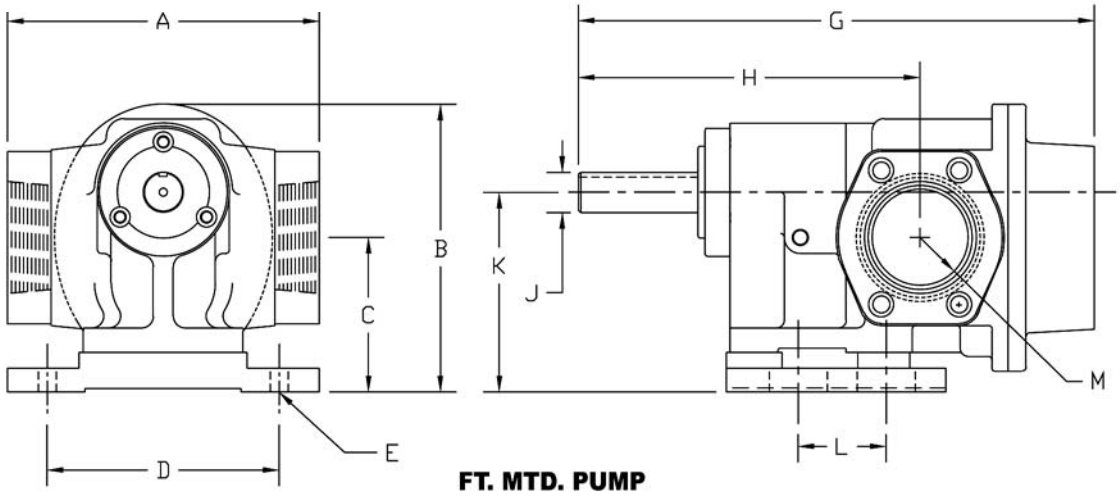

Table 1

Model	A	B	C	D	G	H	J	K	M	Keyway
6S	8	6.25	2.91	5.25	13.88	9.56	1	4.25	2	1/4 x 1/8
8S	9.75	9.00	4.58	7.25	16.13	10.63	1 1/4	6.25	3	1/4 x 1/8
10S	9.75	9.00	4.58	7.25	16.13	10.63	1 1/4	6.25	3	1/4 x 1/8
12S	12.125	11.56	6.06	10.00	18.50	11.94	1 1/2	8.00	4	3/8 x 3/16
14S	12.125	11.56	6.06	10.00	18.50	11.94	1 1/2	8.00	4	3/8 x 3/16

OPERATING CHARACTERISTICS

Table 2

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		75 PSI		100 PSI		200 PSI		300 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
6S	0.0361	0.008	600	21.7	0.6	21.5	1.3	21.4	1.6	21.3	1.9	20.8	3.2	20.4	4.5
			860	31.1	0.8	30.8	1.8	30.6	2.3	30.5	2.7	29.8	4.6	29.2	6.5
			1140	41.2	1.1	40.8	2.4	40.6	3.0	40.4	3.6	39.5	6.1	38.7	8.6
8S	0.056	0.013	600	33.6	0.9	33.3	1.9	33.2	2.5	32.9	2.9	32.3	4.9	31.6	7.0
			860	48.2	1.3	47.8	2.8	47.5	3.5	47.2	4.2	46.2	7.1	45.3	10.0
			1140	63.9	1.7	63.3	3.7	63.0	4.7	62.6	5.6	61.3	9.4	60.0	13.3
10S	0.079	0.018	600	47.7	1.3	47.2	2.7	47.0	3.5	46.7	4.2	45.8	7.1	44.8	9.9
			860	68.3	1.8	67.7	3.9	67.4	5.0	67.0	6.0	65.6	10.1	64.3	14.3
			1140	90.6	2.4	89.7	5.2	89.3	6.6	88.8	7.9	87.0	13.4	85.2	18.9
12S	0.113	0.026	600	67.8	1.8	67.1	3.8	66.8	4.9	66.4	5.9	65.1	10.1	63.7	14.1
			860	97.2	2.6	96.2	5.5	95.7	7.0	95.2	8.4	93.2	14.4	91.3	20.2
			1140	128.8	3.4	127.5	7.3	126.9	9.3	126.2	11.2	123.6	19.1	121.0	26.8
14S	0.204	0.035	600	122.2	3.2	121.0	6.9	120.3	8.8	119.7	10.6	117.3	18.1	114.8	25.5
			860	175.1	4.6	173.4	9.9	172.5	12.6	171.6	15.2	168.1	25.9	164.6	36.5

Delivery and horsepower are based on liquid viscosity of 300 SSU at speed and pressures shown.

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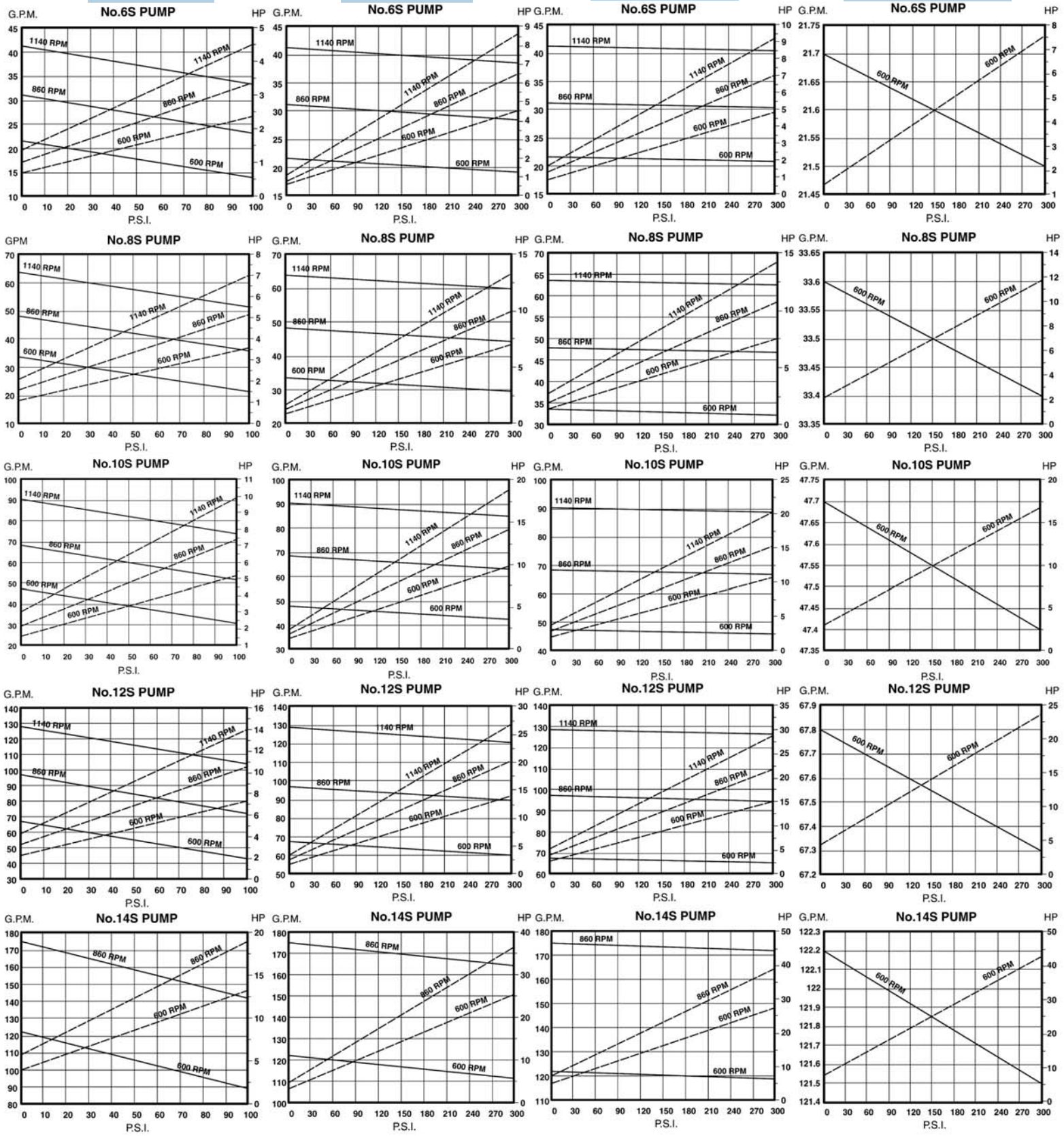
FLOW CURVES

SOLID LINE = GPM BROKEN LINE= HP

32 SSU LIQUID	***300 SSU LIQUID***	***1,000 SSU LIQUID***	***5,000 SSU LIQUID***



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PUMP DIMENSIONS (INCHES) BASE MOUNTED TO STANDARD FOOT MOUNTED MOTOR

Heavy Duty S Series pumps are available as base mounted pump and motor assemblies. Each assembly includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

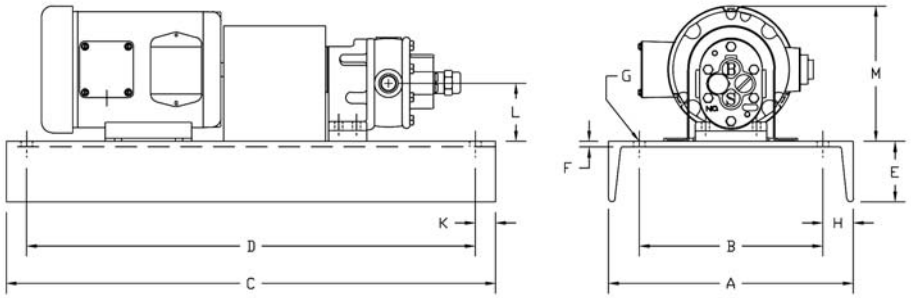


Table 3

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
6SD	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.16	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.16	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.16	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	5.16	12.88
8SD	215T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	4.83	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	4.83	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	4.83	12.88
	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.58	14.63
	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.58	14.63
10SD	215T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	4.83	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	4.83	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	4.83	12.88
	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.58	14.63
	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.58	14.63
12SD	254T	18.00	15.00	48.00	46.00	3.95	0.45	0.56	1.50	1.00	6.06	12.88
	256T	18.00	15.00	48.00	46.00	3.95	0.45	0.56	1.50	1.00	6.06	12.88
	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	6.06	14.63
	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	6.06	14.63
	324T	30.00	26.00	60.00	56.00	3.72	0.72	0.75	2.00	2.00	6.06	16.50
	326T	30.00	26.00	60.00	56.00	3.72	0.72	0.75	2.00	2.00	6.06	16.50
14SD	254T	18.00	15.00	48.00	46.00	3.95	0.45	0.56	1.50	1.00	6.06	12.88
	256T	18.00	15.00	48.00	46.00	3.95	0.45	0.56	1.50	1.00	6.06	12.88
	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	6.06	14.63
	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	6.06	14.63
	324T	30.00	26.00	60.00	56.00	3.72	0.72	0.63	2.00	2.00	6.06	16.50
	326T	30.00	26.00	60.00	56.00	3.72	0.72	0.75	2.00	2.00	6.06	16.50
	364T	30.00	26.00	60.00	56.00	3.72	0.72	0.75	2.00	2.00	7.06	18.50

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E **ORDER PUMP & DRIVE 713-A-B-C-D-E**

Pump		Drive	Assembly
A	B	C	D
Pump Model	**Turning Direction**	**Pump Drive/Bracket**	**Assembly: Pump & Bracket**
60= Foot Mount Model 6S 80= Foot Mount Model 8S 100= Foot Mount Model 10S 120= Foot Mount Model 12S 140=Foot Mount Model 14S	2= CW 3= CCW	*Select Model & Motor Frame From Table 3 Example: 12SD-182TC *Call us for other mounting/drive options	A= Factory Assembly B= Field Assembly

E- Options
Opt 1= Ductile Iron Casing Opt 4= Carbon Graphite Bearings opt 7= Iron Sleeve Bearings

ORDER PUMP, DRIVE AND MOTOR 713-A-B-C-D-E-F

F
Motor
Specify motor frame, motor speed, horse power, voltage, frequency & enclosure rating Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.

CLARK SOLUTIONS

53/55 Series Rotary Gear Pump

Pressure to 200 PSI, Flow to 51.4 GPM, Drive Speed to 1800 RPM

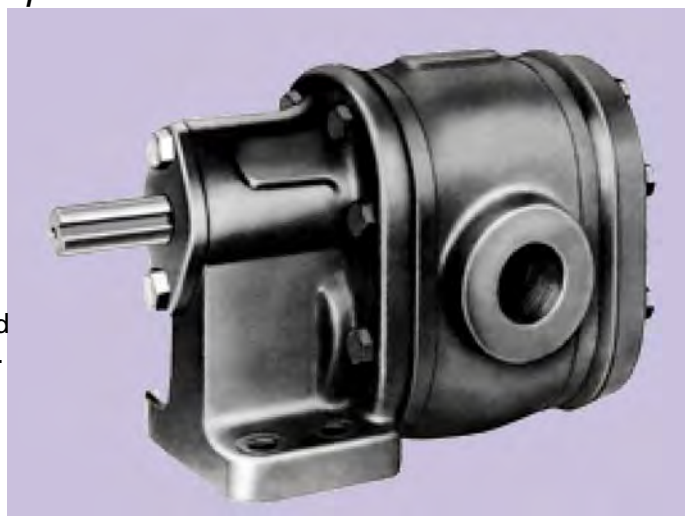
DESCRIPTION

Series 53/55 pumps operate quietly at nominal motor speeds and discharge large volumes of liquid at medium pressures. Typical applications include hydraulic power for positioning devices, lifts, machine actuation, liquid pressurization for fuel burners and blenders as well as general transfer in all industries.

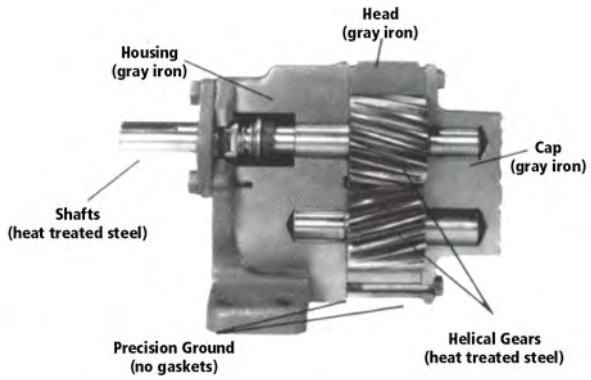
The pumps are available in cast iron(standard) and ductile iron. They are designed to operate at speeds to 1725 RPM, pressures to 200 PSI, and flow rates to 51.4 GPM. The standard seal is a mechanical self adjusting seal with Buna-N elastomer. Lubrication of the anti-friction bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting.

These pumps are self-priming and uni-directional. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") resulting in a pump with better lift, reduced slippage and longer service life. Standard pumps operate to 250°F and, with modifications, to 500°F.

Helical gears provide very smooth and quiet operation at direct motor speeds in hydraulic, lubrication and transfer applications in almost every industry classification.



Foot Mounted Pump



SPECIFICATIONS

GENERAL

Design: Drive speeds to 1725 RPM; discharge pressures to 200 PSI; flow rates to 51.4 GPM; foot or flange mounted

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron.

Gears: Helical gears

Bearings: Ball bearings

Seal: Self adjusting mechanical seal with Buna-N elastomer. Also available with compression packing. Mechanical seal available with different elastomers for pumping different types of liquids.

Lubrication: Self-lubricating using the pumped liquid. Also available for handling non-lubricating liquids.

Rotation: Clockwise or counter-clockwise rotation. Specify at time of order.

Liquid Viscosities: 100 SSU to 3,000 SSU. Clean liquids having good lubricating quality. Adaptable for handling liquids of higher or lower viscosities.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Drive Options: A-Drive (pump connected to C-face motor with adaptor bracket and coupling); D-Drive (pump coupled to motor mounted on base plate); E-Drive (pump direct coupled to end bell of a foot mounted motor); B-Drive (pump and motor con nected by V-belt and pulleys mounted on baseplate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.

FEATURES

- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

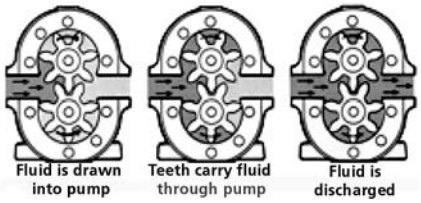
- ***BEARINGS***

  Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction bearings are replaceable.

- ***SEALS***

  Compression packing provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



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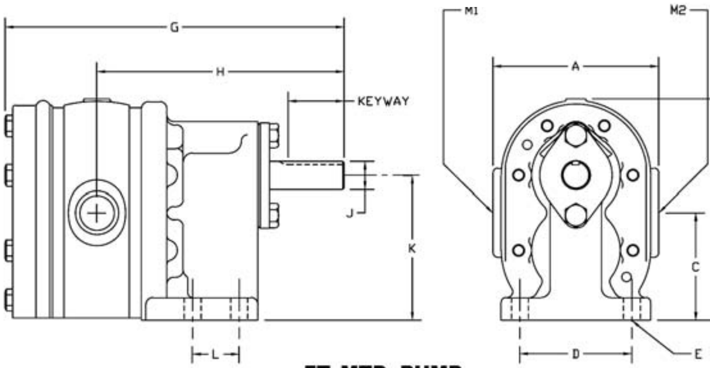
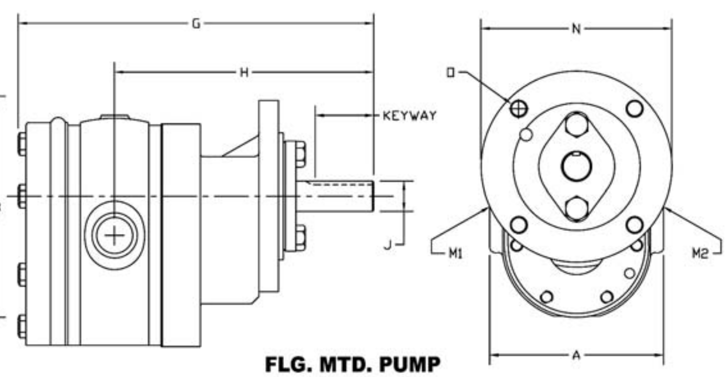
PUMP DIMENSIONS (INCHES)



FT. MTD. PUMP



FLG. MTD. PUMP

Table 1

Model	A	B	C	D	E	G	H	J	K	L	M1	M2	N	O	Keyway
53	4.52	6.03	2.88	3.00	29/64	9.13	6.63	0.75	3.88	1.25	1	3/4	4 7/8	3/8-16	3/16 x 3/32
55	5.00	6.03	2.88	3.00	29/64	10.13	7.13	0.75	3.88	1.25	1 1/4	1	4 7/8	3/8-16	3/16 x 3/32

OPERATING CHARACTERISTICS

Table 2

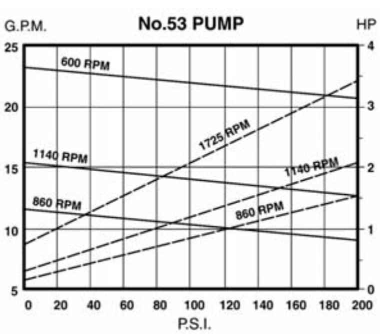
Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		50 PSI		75 PSI		100 PSI		200 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
53	0.01347	0.0090	860	11.6	0.2	11.1	0.5	10.9	0.7	10.7	0.2	9.8	1.6
			1140	15.4	0.3	14.9	0.8	14.7	1.0	14.5	1.2	13.6	2.2
			1725	23.2	0.8	22.7	1.4	22.5	1.8	22.3	2.1	21.4	3.5
55	0.02984	0.0200	860	25.6	0.3	24.6	1.0	24.1	1.4	23.6	1.8	21.6	3.5
			1140	35.0	0.5	34.0	1.5	33.5	2.0	33.0	2.6	31.0	4.7
			1725	51.4	1.3	50.4	2.6	49.9	3.4	49.4	4.2	47.4	7.5

Delivery and horsepower are based on liquid viscosity of 100 SSU at speed and pressures shown.

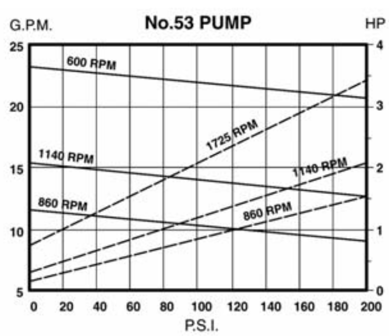
FLOW CURVES

SOLID LINE = GPM   BROKEN LINE= HP

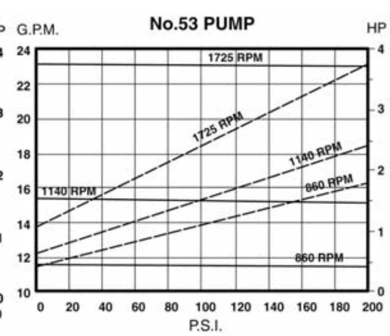
70 SSU LIQUID



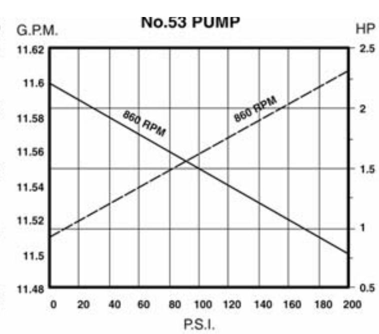
100 SSU LIQUID

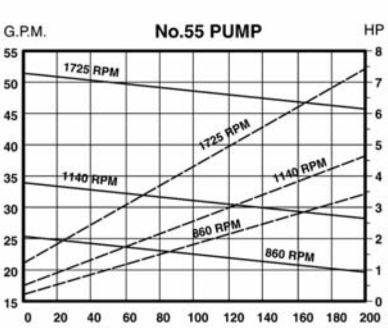


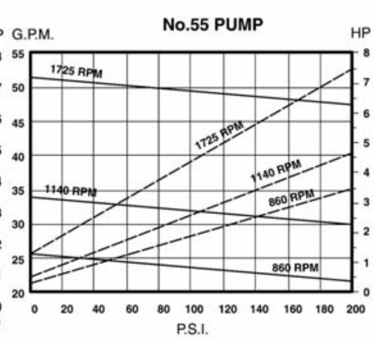
1,000 SSU LIQUID

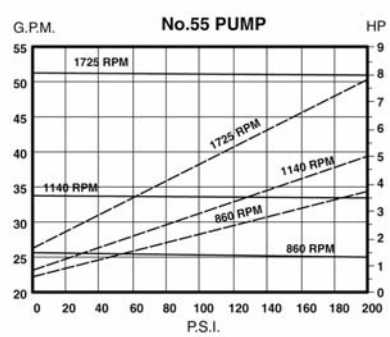


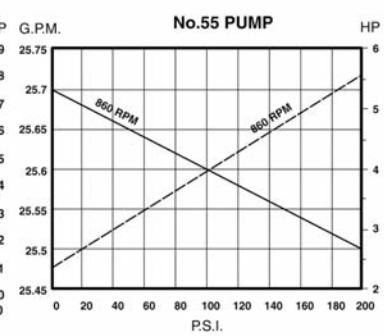
3,000 SSU LIQUID











PUMP DIMENSIONS (INCHES) CLOSE COUPLED MOTOR (E-DRIVE)

53/55-Series pumps are available direct coupled to the end bell of a foot mounted motor. This assembly, referred to as an E-Drive, ensures accurate alignment and requires less space than a pump connected to the C-Face of a motor. They are available with motor speeds of 860, 1140 &1725 RPM.

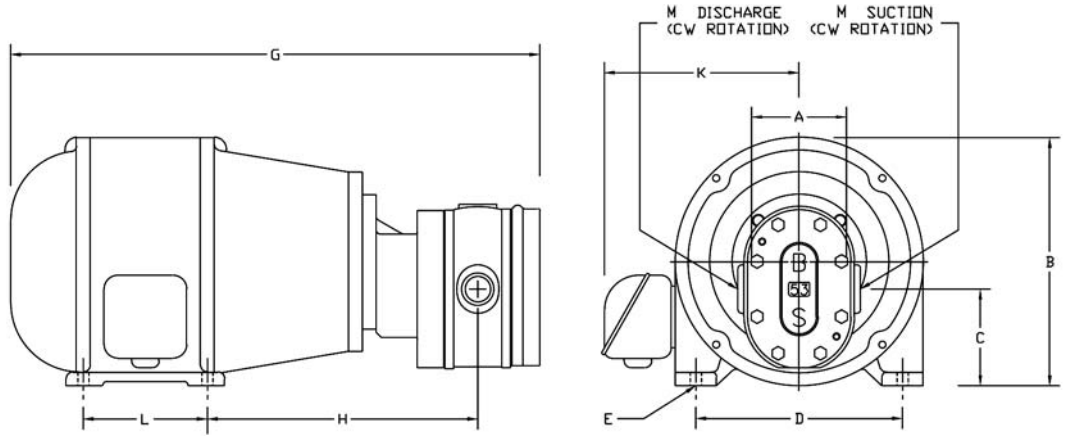


Table 3

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M1	M2
53E	182	4.44	9.00	3.50	7.50	0.41	18.31	8.94	7.06	4.50	3/4	1
	184	4.44	9.00	3.50	7.50	0.41	19.31	8.94	7.06	5.50	3/4	1
	213	4.44	10.38	4.25	8.50	0.41	20.88	9.75	7.94	5.50	3/4	1
	215	4.44	10.38	4.25	8.50	0.41	21.38	9.75	7.94	7.00	3/4	1
	254U	4.44	12.38	5.25	10.00	0.41	23.56	11.93	9.81	8.25	1	1 1/4
55E	182	5.00	9.00	3.50	7.50	0.41	19.68	10.82	7.06	4.50	1	1 1/4
	184	5.00	9.00	3.50	7.50	0.41	20.68	10.82	7.06	5.50	1	1 1/4
	213	5.00	10.38	4.25	8.50	0.41	22.25	11.63	7.94	5.50	1	1 1/4
	215	5.00	10.38	4.25	8.50	0.41	22.75	11.63	7.94	7.70	1	1 1/4
	254U	5.00	12.38	5.25	10.00	0.41	24.93	13.81	9.81	8.25	1	1 1/4

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR (A-DRIVE)

53/55 Series pumps are available direct coupled to a NEMA C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate. Available motor speeds are 860, 1140 &1725 RPM.

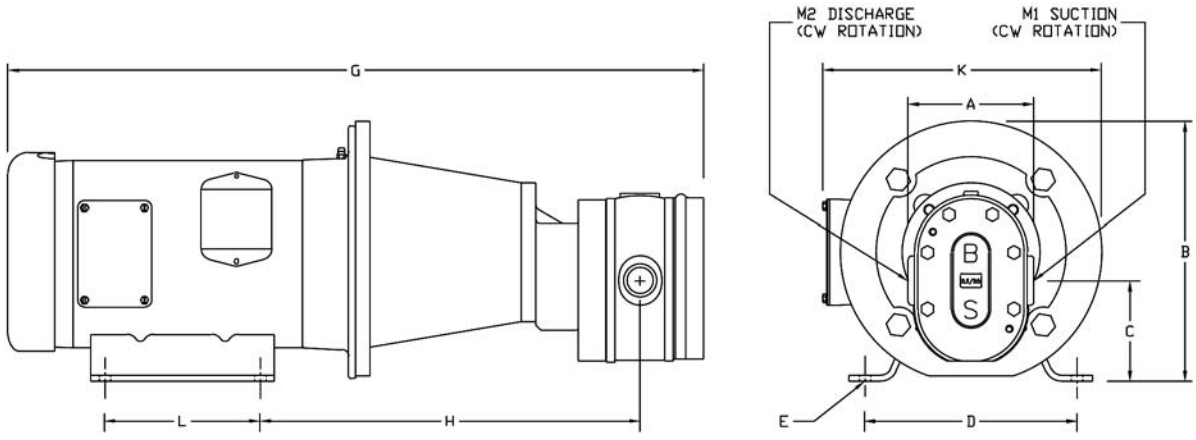


Table 4

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M1	m2
53A	56C	4.44	6.88	2.50	4.88	0.34	21.19	11.74	8.31	3.00	3/4	1
	145TC	4.44	6.88	2.50	5.50	0.34	22.91	12.06	8.56	5.00	3/4	1
	182TC	4.44	8.69	3.50	7.50	0.41	24.50	13.68	9.81	4.50	3/4	1
	184TC	4.44	8.69	3.50	7.50	0.41	25.50	13.68	9.81	5.50	3/4	1
55A	56C	5.00	6.88	2.50	4.88	0.34	22.19	12.24	8.31	3.00	1	1 1/4
	145TC	5.00	6.88	2.50	5.50	0.34	23.91	12.56	8.56	5.00	1	1 1/4
	182TC	5.00	8.69	3.50	7.50	0.41	25.50	14.18	9.81	4.50	1	1 1/4
	184TC	5.00	8.69	3.50	7.50	0.41	26.50	14.18	9.81	5.50	1	1 1/4
	213TC	5.00	10.25	4.25	8.50	0.41	28.41	15.06	12.16	5.50	1	1 1/4
	215	5.00	10.25	4.25	8.50	0.41	29.91	15.06	12.16	7.00	1	1 1/4

PUMP DIMENSIONS (INCHES) BASE MOUNTED ASSEMBLIES (D-DRIVE)

53/54 Series pumps are available as base mounted pump and motor assemblies. Each assembly includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

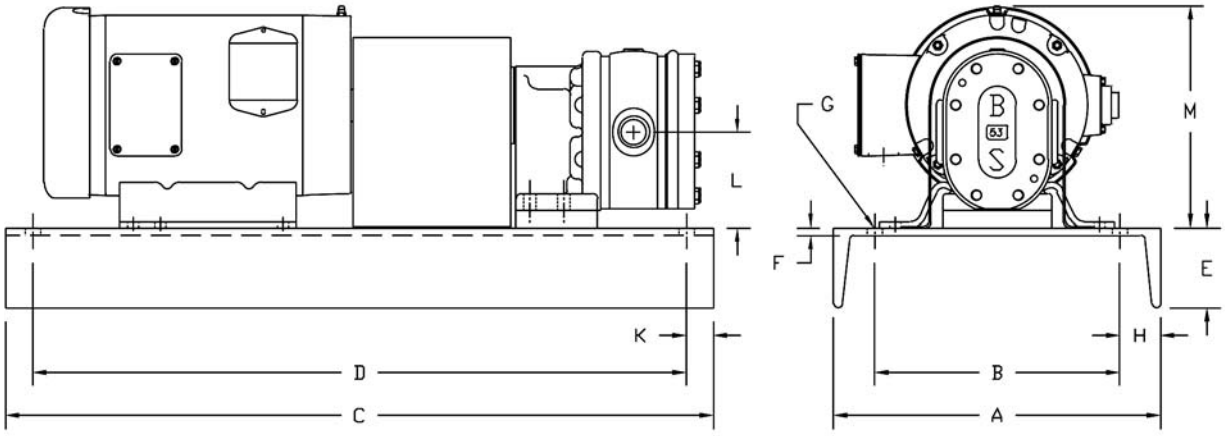


Table 5

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
53D	56	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145T	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182T	15.00	12.00	30.00	28.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	184T	15.00	12.00	30.00	28.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
55D	56	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	145T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	2.50	6.88
	182T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.50	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	215T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E **ORDER PUMP & DRIVE 713-A-B-C-D-E**

Pump		Drive	Assembly
A	B	C	D
Pump Model	**Turning Direction**	**Pump Drive/Bracket**	**Assembly: Pump & Bracket**
53= Foot Mount Model 53 953= Flange Mount Model 53 55= Foot Mount Model 55 955= Flange Mount Model 55	2= CW 3= CCW	*Select Model & Motor Frame From Tables 3,4 OR 5 Example: 53D-182T *Call us for other mounting/drive options	A= Factory Assembly B= Field Assembly

E- Options
Opt 1= Ductile Iron Casing

ORDER PUMP, DRIVE AND MOTOR 713-A-B-C-D-E-F

F
Motor
1) Specify motor frame: tables 4,5 or 6 2)Specify motor speed & horsepower (see flow charts) 3) Specify voltage, frequency & enclosure rating Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.

Clark Solutions • 10 Brent Drive • Hudson, MA 01749 • Tel. 978 / 568 3400 • Fax 978 / 568 0060

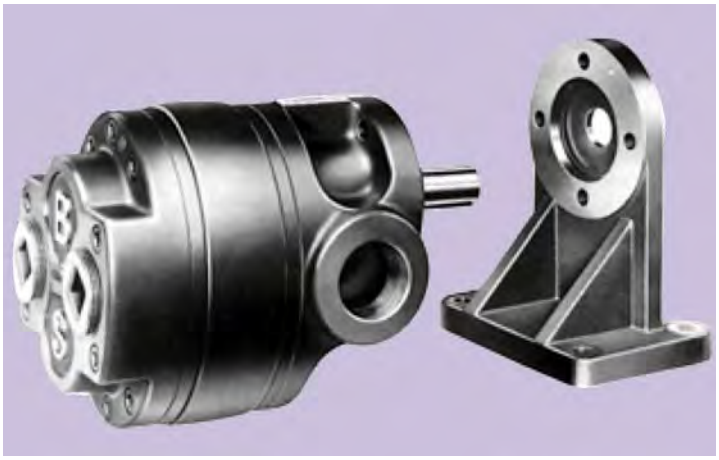
CLARK SOLUTIONS

500 Series Rotary Gear Pump

Pressure to 1000 PSI, Flow to 60 GPM, Drive Speed to 1725 RPM

DESCRIPTION

500 Series pumps are designed to provide quiet and efficient service at standard motor speeds and moderately high pressures. Typical applications are supplying hydraulic power in machine tools and construction equipment, as well as oil field gathering line service and deep hole drilling applications.



The pumps are available in cast iron and ductile iron. They are designed to operate at speeds to 1725 RPM, pressures to 1,000 PSI, and flow rates to 60 GPM. The standard seal is a mechanical self adjusting seal with Buna-N elastomer. Lubrication of the anti-friction bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting and integral relief valves.

These pumps are self-priming and uni-directional. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") resulting in a pump with better lift, reduced slippage and longer service life. Standard pumps operate to 250°F and, with modifications, to 500°F.

Spur and herringbone gears are accurately cut and rugged.

S Series Gear Pump

SPECIFICATIONS

GENERAL

Design: Drive speeds to 1725 RPM; discharge pressures to 1,000 PSI; flow rates to 60 GPM; foot or flange mounted; with or without integral relief valve.

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron.

Gears: Models 502 & 504, spur gears; Models 507,511, 517, 525, 537, 547, 557 & 567, herringbone gears.

Bearings: Anti-friction needle roller bearings. Also available with carbon graphite or bronze bearings.

Seal: Self adjusting mechanical seal. Also available with compression packing. Mechenical seal available with different elastomers for pumping different types of liquids.

Lubrication: Self-lubricating using the pumped liquid.

Rotation: Clockwise or counter-clockwise. A reversible back drain permits direction of rotation to be easily changed in the field.

Liquid Viscosities: 100 SSU to 1,000 SSU recommended. Clean liquids having good lubricating quality. Adaptable for handling liquids of higher or lower viscosities.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Drive Options: E-Drive (pump close coupled to motor); A-Drive (pump connected to C-face motor with adapter bracket and coupling); D-Drive (pump coupled to motor mounted on base plate); GR-Drive (pump coupled to gear reducer coupled to motor mounted on baseplate); B-Drive (pump and motor connected by V-belt and pulleys mounted on base plate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.

FEATURES

- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

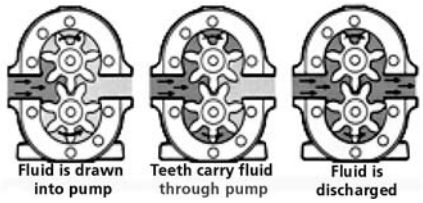
- ***BEARINGS***

  The heart of the pump. Sleeve and plain bearings are especially adapted to main tain even gear and shaft rotation for normal pump service. Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

- ***SEALS***

  Self-adjusting mechanical seal and compression packing provides an ample safe guard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



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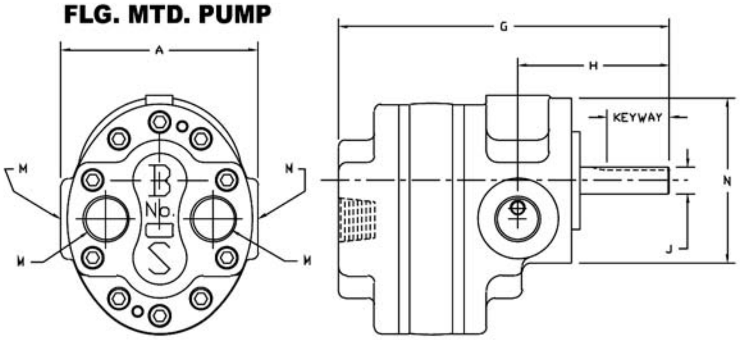
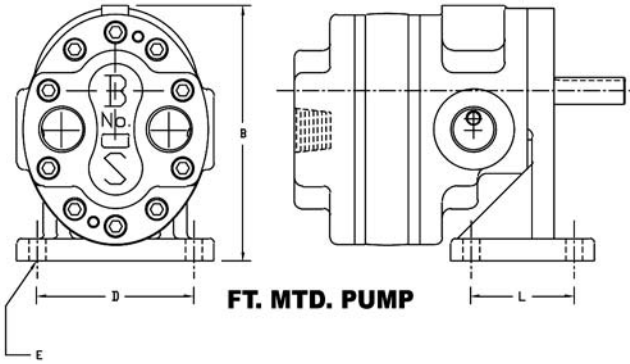
PUMP DIMENSIONS (INCHES)

FLG. MTD. PUMP





FT. MTD. PUMP

Note: Unit is not dimensioned with optional integral relief valve. The purpose of the relief valve is to relieve pressure in the pump when the discharge line is closed or otherwise obstructed. This is accomplished internally by routing the discharge back to the suction side of the pump when discharge pressure exceeds the set value. The relief valve is designed as a safety device and is not intended as a directional control valve nor is it intended for use under conditions calling for extended periods of by-pass. The relief valve should always be positioned on the discharge side of the pump. Placement on the suction side of the pump will render the pump inoperable.

Table 1

Model	A	B	C	D	E	G	H	J	K	L	M	N	O	Keyway
507	4.00	5.19	3.19	3.00	0.39	7.56	3.38	5/8	3.50	2.38	3/4	3.25	5/16-18	3/16 x 3/32
511	4.00	5.19	3.19	3.00	0.39	8.06	3.38	5/8	3.50	2.38	3/4	3.25	5/16-18	3/16 x 3/32
517	5.50	7.13	3.66	4.38	0.47	9.25	4.25	3/4	4.75	2.88	1	4.68	7/16-14	3/16 x 3/32
525	5.50	7.13	3.66	4.38	0.47	9.75	4.25	3/4	4.75	2.88	1	4.68	7/16-14	3/16 x 3/32
537	6.25	8.00	4.38	5.00	0.53	10.75	4.50	1.00	5.63	3.38	1 1/2	4.68	7/16-14	1/4 x 1/8
547	6.25	8.00	4.38	5.00	0.53	11.25	4.50	1.00	5.63	3.38	1 1/2	4.68	7/16-14	1/4 x 1/8
557	6.25	8.00	4.38	5.00	0.53	11.75	4.50	1.00	5.63	3.38	1 1/2	4.68	7/16-14	1/4 x 1/8
567	3.25	8.00	4.38	5.00	0.53	13.25	4.50	1.00	5.63	3.38	2	4.68	7/16-14	1/4 x 1/8

OPERATING CHARACTERISTICS

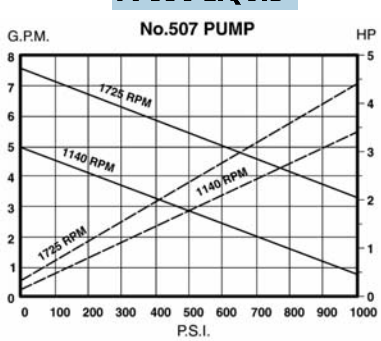
Table 2 — **Delivery and horsepower are based on liquid viscosity if 100 SSU at speed and pressures shown.**

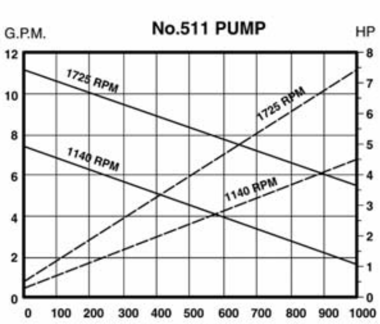
Model	Drive Speed (RPM)	0 PSI		100 PSI		200 PSI		300 PSI		400 PSI		500 PSI		1000 PSI	
		GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
507	1140	5.0	0.20	4.7	0.50	4.4	0.85	4.1	1.2	3.8	1.5	3.5	1.9	2.0	3.5
	1725	7.6	0.40	7.3	0.80	7.0	1.2	6.7	1.6	6.4	2.0	6.1	2.5	4.6	4.5
511	1140	7.5	0.40	7.0	0.80	6.7	1.2	6.3	1.6	5.9	2.0	5.5	2.5	3.5	4.6
	1725	11.1	0.60	10.7	1.3	10.3	2.0	9.8	2.6	9.4	3.3	9.0	4.0	7.0	7.5
517	1140	12.0	0.40	11.3	1.2	11.0	1.8	10.5	2.6	10.0	3.2	9.5	3.9	-	-
525	1140	17.0	0.50	15.5	1.5	15.0	2.6	14.2	3.6	13.5	4.5	12.7	5.5	-	-
537	1140	24.5	0.60	22.5	2.2	20.5	3.6	19.0	5.0	17.0	6.4	15.0	7.9	-	-
547	1104	31.1	0.70	29.0	2.7	27.0	4.5	25.3	6.3	23.5	8.1	21.5	9.9	-	-
557	1140	37.5	0.80	35.5	3.2	33.5	5.4	31.5	7.6	30.0	9.8	28.0	12.0	-	-
567	1140	57.9	1.20	56.0	4.9	54.0	8.3	52.1	11.7	50.2	15.1	48.3	18.5	-	-

FLOW CURVES

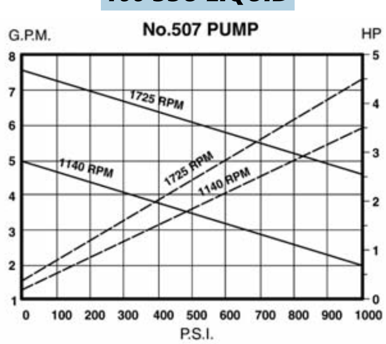
SOLID LINE = GPM BROKEN LINE= HP

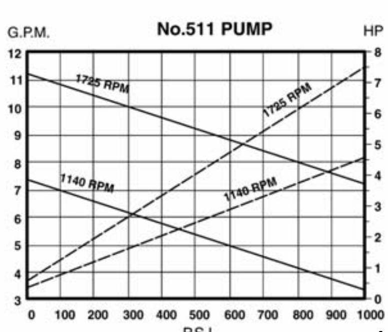
70 SSU LIQUID



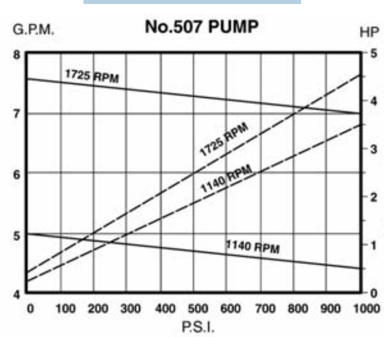


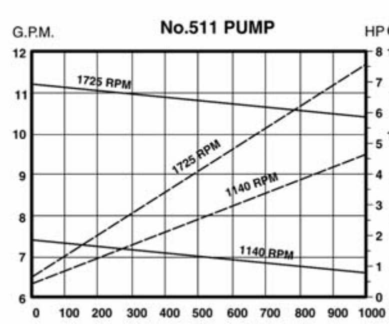
100 SSU LIQUID



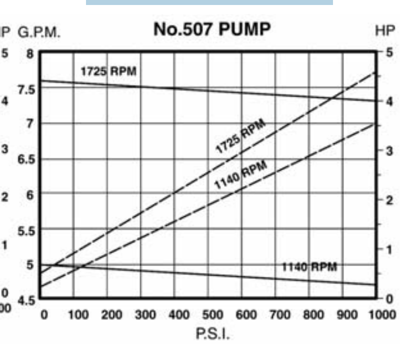


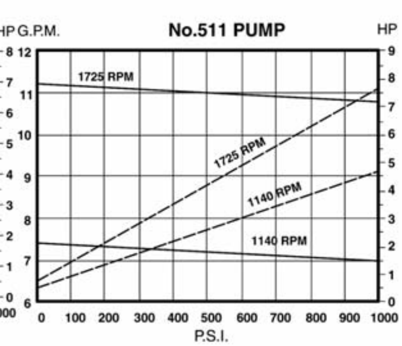
500 SSU LIQUID





1,000 SSU LIQUID

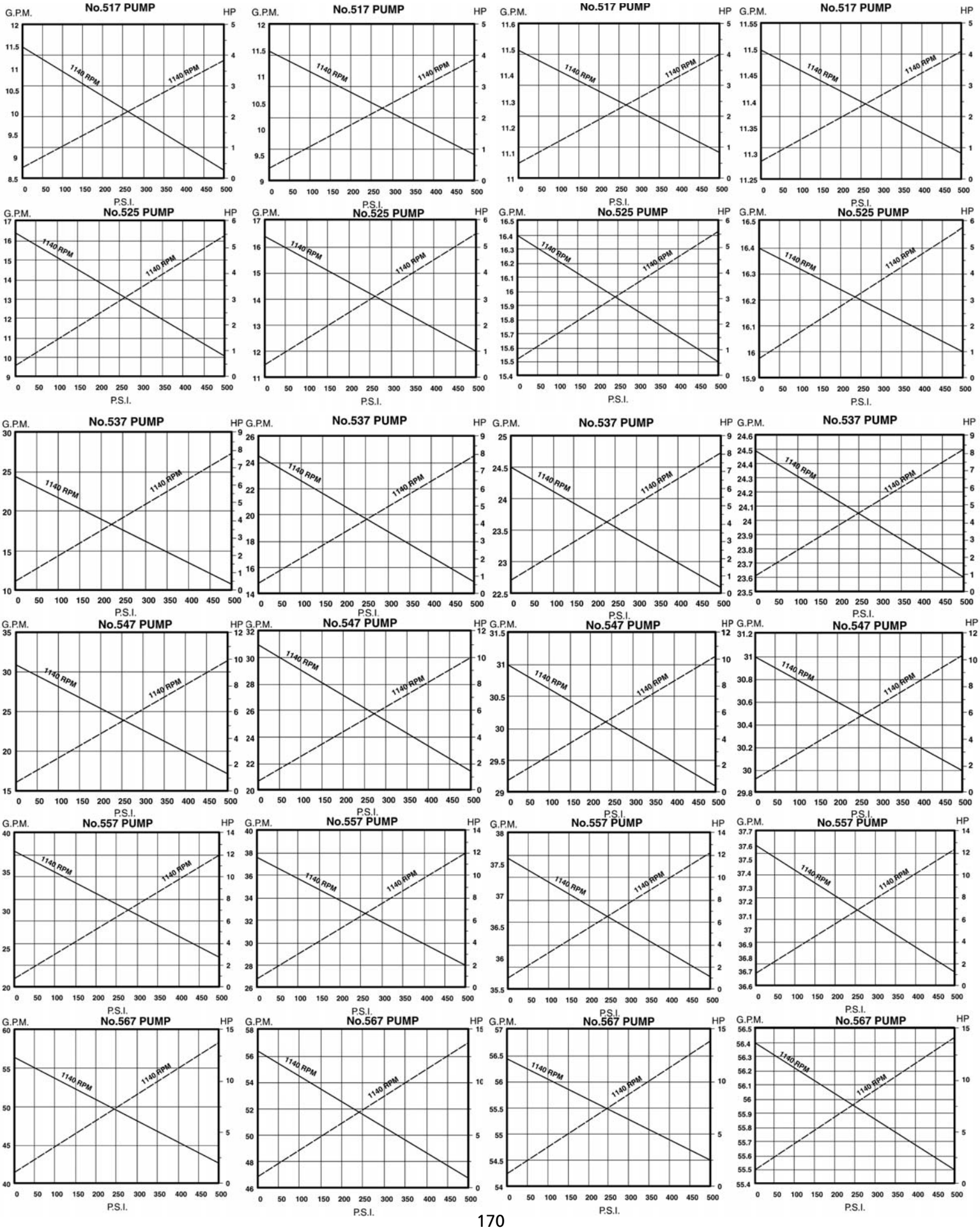




FLOW CURVES

SOLID LINE = GPM BROKEN LINE= HP

70 SSU LIQUID | ***100 SSU LIQUID*** | ***500 SSU LIQUID*** | ***1,000 SSU LIQUID***



PUMP DIMENSIONS (INCHES) CLOSE COUPLED MOTOR (E-DRIVE)

500 Series pumps are available direct coupled to the end bell of a foot mounted motor. This assembly, referred to as anE-Drive, ensures accurate alignment and requires less space than a pump connected to the C-Face of a motor. This configuration is available in motor speeds of 860, 1140, & 1725 RPM

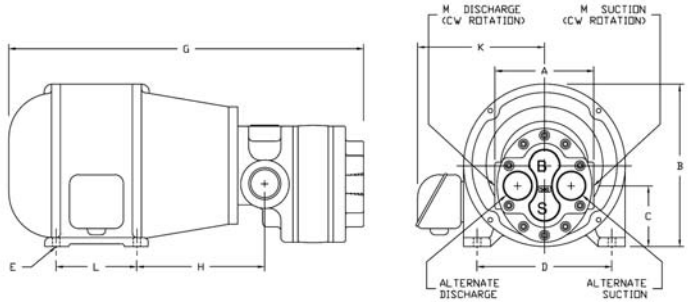


Table 3

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
507E	182	4.00	9.00	4.19	7.50	0.406	N/A	17.81	6.50	7.06	4.50	3/4
	184	4.00	9.00	4.19	7.50	0.406	N/A	18.81	6.50	7.06	5.50	3/4
	213	4.00	10.38	4.94	8.50	0.406	N/A	20.38	7.31	7.94	5.50	3/4
	215	4.00	10.38	4.94	8.50	0.406	N/A	21.88	7.31	7.94	7.00	3/4
	254U	4.00	12.38	5.94	10.00	0.531	N/A	24.56	8.13	9.81	8.25	3/4
511E	182	4.00	9.00	4.19	7.50	0.406	N/A	18.31	6.50	7.06	4.50	3/4
	184	4.00	9.00	4.19	7.50	0.406	N/A	19.31	6.50	7.06	5.50	3/4
	213	4.00	10.38	4.94	8.50	0.406	N/A	20.88	7.31	7.94	5.50	3/4
	215	4.00	10.38	4.94	8.50	0.406	N/A	22.38	7.31	7.94	7.00	3/4
	254U	4.00	12.38	5.94	10.00	0.531	N/A	25.06	8.12	9.81	8.25	3/4
	256U	4.00	12.38	5.94	10.00	0.531	N/A	26.81	8.12	9.81	10.00	3/4
517E	213	5.50	10.38	4.16	8.50	0.406	N/A	21.69	7.83	7.94	5.50	1
	215	5.50	10.38	4.16	8.50	0.406	N/A	23.19	7.83	7.94	7.00	1
	254U	5.50	12.38	5.16	10.00	0.531	N/A	25.88	8.63	9.81	8.25	1
525E	213	5.50	10.38	4.16	8.50	0.406	N/A	22.19	7.81	7.94	5.50	1
	215	5.50	10.38	4.16	8.50	0.406	N/A	23.69	7.81	7.94	7.00	1
	254U	5.50	12.38	5.16	10.00	0.531	N/A	26.38	8.63	9.81	8.25	1
	256U	5.50	12.38	5.16	10.00	0.531	N/A	28.13	8.63	9.81	10.00	1
537E	213	6.25	10.38	4.00	8.50	0.406	N/A	23.19	8.06	7.94	5.50	1 1/2
	215	6.25	10.38	4.00	8.50	0.406	N/A	24.69	8.06	7.94	7.00	1 1/2
	254U	6.25	12.38	5.00	10.00	0.531	N/A	27.38	8.88	9.81	8.25	1 1/2
	256U	6.25	12.38	5.00	10.00	0.531	N/A	29.13	8.88	9.81	10.00	1 1/2
	284U	6.25	13.94	5.75	11.00	0.531	N/A	29.50	9.19	10.75	9.50	1 1/2
547E	213	6.25	10.38	4.00	8.50	0.406	N/A	23.69	8.06	7.94	5.50	1 1/2
	215	6.25	10.38	4.00	8.50	0.406	N/A	23.69	8.06	7.94	7.00	1 1/2
	254U	6.25	12.38	5.00	10.00	0.531	N/A	27.88	8.88	9.81	8.25	1 1/2
	256U	6.25	12.38	5.00	10.00	0.531	N/A	27.88	8.88	9.81	10.00	1 1/2
	284U	6.25	13.94	5.75	11.00	0.531	N/A	30.00	9.19	10.75	9.50	1 1/2
557E	213	6.25	10.38	4.00	8.50	0.406	N/A	24.19	8.06	7.94	5.50	1 1/2
	215	6.25	10.38	4.00	8.50	0.406	N/A	25.69	8.06	7.94	7.00	1 1/2
	254U	6.25	12.38	5.00	10.00	0.531	N/A	28.38	8.88	9.81	8.25	1 1/2
	256U	6.25	12.38	5.00	10.00	0.531	N/A	30.13	8.88	9.81	10.00	1 1/2
	284U	6.25	13.94	5.75	11.00	0.531	N/A	30.50	9.19	10.75	9.50	1 1/2
	286U	6.25	13.94	5.75	11.00	0.531	N/A	32.00	9.19	10.75	11.00	1 1/2
	324U	6.25	15.94	6.75	12.50	0.656	N/A	32.75	10.00	12.13	10.50	1 1/2
567E	213	6.25	10.38	4.00	8.50	0.406	N/A	25.69	8.06	7.94	5.50	2
	215	6.25	10.38	4.00	8.50	0.406	N/A	27.19	8.06	7.94	7.00	2
	254U	6.25	12.38	5.00	10.00	0.531	N/A	29.88	8.88	9.81	8.25	2
	256U	6.25	12.38	5.00	10.00	0.531	N/A	31.63	8.88	9.81	10.00	2
	284U	6.25	13.94	5.75	11.00	0.531	N/A	32.00	9.19	10.75	9.50	2
	286U	6.25	13.94	5.75	11.00	0.531	N/A	33.50	9.19	10.75	11.00	2
	324U	6.25	15.94	6.75	12.50	0.656	N/A	34.25	10.00	12.13	10.50	2

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR (A-DRIVE)

500 Series pumps are available direct coupled to a NEMA C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate. This configuration is available in motor speeds of 860, 1140, & 1725 RPM.

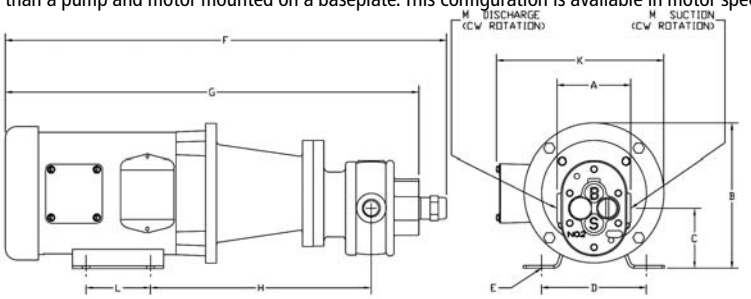


Table 4

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M
507A	56C	4.00	6.88	2.88	4.88	0.34	20.19	8.93	8.31	3.00	3/4
	145TC	4.00	6.88	2.88	5.50	0.34	21.91	9.25	8.56	5.00	3/4
	182TC	4.00	8.69	3.88	7.50	0.41	23.50	10.87	9.81	4.50	3/4
	184TC	4.00	8.69	3.88	7.50	0.41	24.50	10.87	9.81	5.50	3/4
	213TC	4.00	10.25	4.63	8.50	0.41	26.41	11.75	12.16	5.50	3/4
	215TC	4.00	10.25	4.63	8.50	0.41	27.91	11.75	12.16	7.00	3/4

Table 4 Continued

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M
511A	56C	4.00	6.88	2.88	4.88	0.34	20.69	8.93	8.31	3.00	3/4
	145TC	4.00	6.88	2.88	5.50	0.34	22.41	9.25	8.56	5.00	3/4
	182TC	4.00	8.69	3.88	7.50	0.41	24.00	10.87	9.81	4.50	3/4
	184TC	4.00	8.69	3.88	7.50	0.41	25.00	10.87	9.81	5.50	3/4
	213TC	4.00	10.25	4.63	8.50	0.41	26.91	11.75	12.16	5.50	3/4
	215TC	4.00	10.25	4.63	8.50	0.41	28.41	11.75	12.16	7.00	3/4
517A	56C	5.50	6.88	2.88	4.88	0.34	21.88	9.06	8.31	3.00	1
	145TC	5.50	6.88	2.88	5.50	0.34	23.60	9.38	8.56	5.00	1
	182TC	5.50	8.69	3.88	7.50	0.41	25.31	11.88	9.81	4.50	1
	184TC	5.50	8.69	3.88	7.50	0.41	26.31	11.88	9.81	5.50	1
	213TC	5.50	10.25	4.63	8.50	0.41	28.22	12.75	12.16	5.50	1
	215TC	5.50	10.25	4.63	8.50	0.41	29.72	12.75	12.16	7.00	1
525A	56C	5.50	6.88	2.88	4.88	0.34	22.38	9.06	8.31	3.00	1
	145TC	5.50	6.88	2.88	5.50	0.34	24.10	9.38	8.56	5.00	1
	182TC	5.50	8.69	3.88	7.50	0.41	25.81	11.88	9.81	4.50	1
	184TC	5.50	8.69	3.88	7.50	0.41	26.81	11.88	9.81	5.50	1
	213TC	5.50	10.25	4.63	8.50	0.41	28.72	12.75	12.16	5.50	1
	215TC	5.50	10.25	4.63	8.50	0.41	30.22	12.75	12.16	7.00	1
	254TC	5.50	12.88	5.63	10.00	0.53	32.31	13.25	16.09	8.25	1
537A	182TC	6.25	8.69	3.25	7.50	0.41	26.81	12.13	9.81	4.50	1 1/2
	184TC	6.25	8.69	3.25	7.50	0.41	27.81	12.13	9.81	5.50	1 1/2
	213TC	6.25	10.25	4.00	8.50	0.41	29.72	13.00	12.16	5.50	1 1/2
	215TC	6.25	10.25	4.00	8.50	0.41	31.22	13.00	12.16	7.00	1 1/2
	254TC	6.25	12.88	5.00	10.00	0.53	33.31	14.00	16.09	8.25	1 1/2
	256TC	6.25	12.88	5.00	10.00	0.53	35.06	14.00	16.09	10.00	1 1/2
547A	182TC	6.25	8.69	3.25	7.50	0.41	27.31	12.13	9.81	4.50	1 1/2
	184TC	6.25	8.69	3.25	7.50	0.41	28.31	12.13	9.81	5.50	1 1/2
	213TC	6.25	10.25	4.00	8.50	0.41	30.22	13.00	12.16	5.50	1 1/2
	215TC	6.25	10.25	4.00	8.50	0.41	31.72	13.00	12.16	7.00	1 1/2
	254TC	6.25	12.88	5.00	10.00	0.53	33.81	14.00	16.09	8.25	1 1/2
	256TC	6.25	12.88	5.00	10.00	0.53	35.56	14.00	16.09	10.00	1 1/2
557A	182TC	6.25	8.69	3.25	7.50	0.41	27.81	12.13	9.81	4.50	1 1/2
	184TC	6.25	8.69	3.25	7.50	0.41	28.81	12.13	9.81	5.50	1 1/2
	213TC	6.25	10.25	4.00	8.50	0.41	30.72	13.00	12.16	5.50	1 1/2
	215TC	6.25	10.25	4.00	8.50	0.41	32.22	13.00	12.16	7.00	1 1/2
	254TC	6.25	12.88	5.00	10.00	0.53	34.31	14.00	16.09	8.25	1 1/2
	256TC	6.25	12.88	5.00	10.00	0.53	36.06	14.00	16.09	10.00	1 1/2
	286TC	6.25	14.63	5.75	11.00	0.53	37.44	14.00	20.44	11.00	1 1/2
567A	182TC	6.75	8.69	3.25	7.50	0.41	29.88	12.13	9.81	4.50	2
	184TC	6.75	8.69	3.25	7.50	0.41	30.88	12.13	9.81	5.50	2
	213TC	6.75	10.25	4.00	8.50	0.41	32.79	13.00	12.16	5.50	2
	215TC	6.75	10.25	4.00	8.50	0.41	34.29	13.00	12.16	7.00	2
	254TC	6.75	12.88	5.00	10.00	0.53	36.38	14.00	16.09	8.25	2
	256TC	6.75	12.88	5.00	10.00	0.53	38.13	14.00	16.09	10.00	2
	286TC	6.75	14.63	5.75	11.00	0.53	39.51	14.50	14.50	11.00	2

PUMP DIMENSIONS (INCHES) BASE MOUNTED (D-DRIVE)

500 Series pumps are available as base mounted pump and motor assemblies. Each assembly includes the base, flexible coupling, coupling guard, riser blocks (if required), lifting eye-bolts, and mounting hardware. The fabricated steel or channel steel bases are available with optional features such as drip-lip construction, drain plugs, mounting lugs, casters, etc..

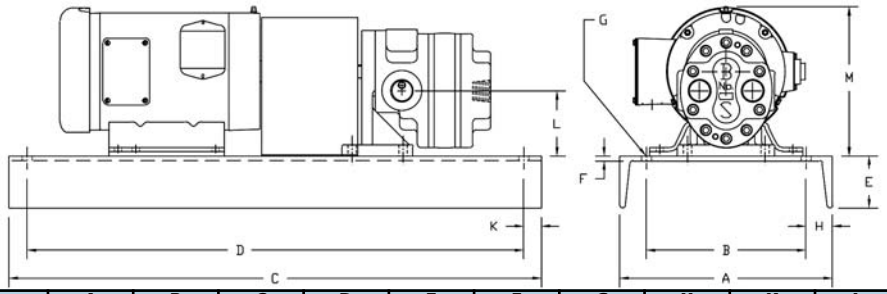


Table 5

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
507D	56	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	145T	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	182T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.88	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.88	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
511D	56	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	145T	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	182T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.88	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.88	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25

Table 5 Continued

Model	Motor Frame	A	B	C	D	E	F	G	H	K	L	M
517D	56	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	145T	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	182T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.88	8.69
	184T	12.00	9.00	32.00	30.00	2.94	0.28	0.56	1.50	1.00	3.88	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
525D	56	12.00	9.00	24.00	22.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	145T	12.00	9.00	26.00	24.00	2.94	0.28	0.56	1.50	1.00	2.88	6.88
	182T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.88	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.28	0.56	1.50	1.00	3.88	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.63	12.88
537D	182T	12.00	9.00	30.00	28.00	2.94	0.28	0.56	1.50	1.00	3.25	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.25	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
547D	182T	12.00	9.00	30.00	28.00	2.94	0.41	0.56	1.50	1.00	3.25	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.25	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
557D	182T	12.00	9.00	30.00	28.00	2.94	0.41	0.56	1.50	1.00	3.25	8.69
	184T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.25	8.69
	213T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	254T	18.00	15.00	42.00	40.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	256T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	1.00	5.75	14.63
567D	182T	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.25	8.69
	184T	15.00	12.00	34.00	32.00	3.41	0.41	0.56	1.50	1.00	3.25	8.69
	213T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.00	10.25
	254T	18.00	15.00	44.00	42.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	256T	18.00	15.00	48.00	46.00	3.95	0.45	0.56	1.50	1.00	5.00	12.88
	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.75	14.63

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E

ORDER PUMP & DRIVE 713-A-B-C-D-E

Pump			Drive	Assembly
A		B	C	D
Pump Model		Turning Direction	Pump Drive/Bracket	Assembly: Pump & Bracket
9502=Flange Mount Model 502	502= Foot Mount Model 502	2= CW 3= CCW	Select Model & Motor Frame From Tables 3 ,4 or 5 Example: 557A-184TC	A= Factory Assembly B= Field Assembly
9504=Flange Mount Model 504	504= Foot Mount Model 504			
9507=Flange Mount Model 507	507= Foot Mount Model 507			
9511=Flange Mount Model 511	511= Foot Mount Model 511			
9517=Flange Mount Model 517	517=Foot Mount Model 517			
9525=Flange Mount Model 525	525=Foot Mount Model 525			
9537=Flange Mount Model 537	537=Foot Mount Model 537			
9547=Flange Mount Model 547	547=Foot Mount Model 547			
9557=Flange Mount Model 557	557=Foot Mount Model 557			
9567=Flange Mount Model 567	567=Foot Mount Model 567			

E- Options
Opt 1= Ductile Iron Casing
Opt 4= Carbon Graphite Bearings
Opt 8= Bronze Bearings

ORDER PUMP, DRIVE AND MOTOR 713-A-B-C-D-E-F

F
Motor
1)Specify motor speed & horsepower (see flow charts) 2) Specify voltage, frequency & enclosure rating Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.

CLARK SOLUTIONS

700 Series Rotary Gear Pump

Pressure to 2000 PSI, Flow to 5.0 GPM, Drive Speed to 1725 RPM

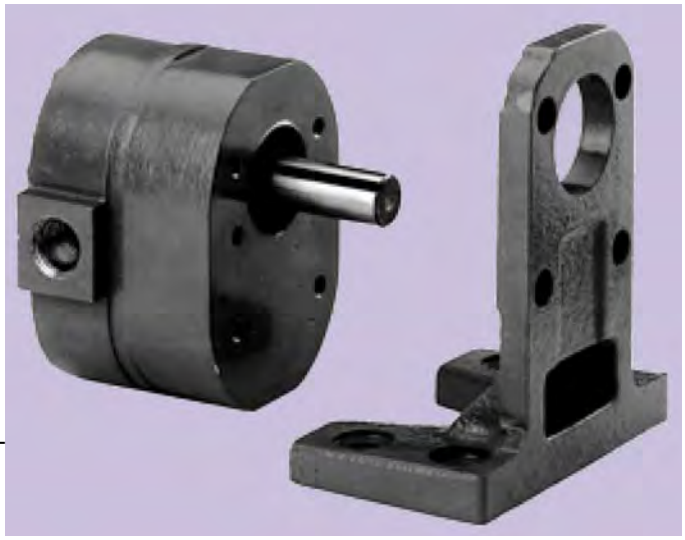
DESCRIPTION

700 Series pumps are high pressure pumps designed to provide quiet and efficient service at standard motor speeds. Typical applications are hydraulic and metering service.

The pumps are available in cast iron and ductile iron. They are designed to operate at speeds to 1725 RPM, pressures to 2000 PSI, and flow rates to 5.0 GPM. The standard seal is a lip seal and lubrication of the anti-friction bearings is accomplished by the circulation of the pumped liquid. All models are available with foot or flange mounting.

These pumps have an outstanding record for reliable performance and long life. The machining of the gears, shafts and housing faces are held to exacting tolerances (within 0.0005") resulting in a pump with better lift, reduced slippage and longer service life.

Standard pumps operate to 250°F and, with modifications, to 500°F.



700 Series Gear Pump

SPECIFICATIONS

GENERAL

Design: Drive speeds to 1725 RPM; discharge pressures to 2000 PSI; flow rates to 5.0 GPM; foot or flange mounted

Material: Cast Iron casings with precision machined, heat treated gears and case hardened shafts. Pumps are also available in Ductile Iron.

Gears: Spur gears

Bearings: Anti-friction needle roller bearings.

Seal: Lip Seal

Lubrication: Self-lubricating using the pumped liquid.

Rotation: Clockwise or counter-clockwise, specify at time of order.

Liquid Viscosities: 100 SSU to 1000 SSU. Clean liquids having good lubricating quality.

Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

Drive Options: A-Drive (pump connected to C-face motor with adapter bracket and coupling). A version of the A-Drive with a shorter, more compact bracket is also available.

Accessories: Repair Kits, Bearing Kits, and Seal Kits.

FEATURES

- ***PRECISION GROUND JOINTS***

  NO GASKETS- Perhaps the biggest advantage to these pumps. As gaskets are not used, original tolerances are maintained for consistent performance and the time once lost in halting operations to replace a worn gasket is saved.

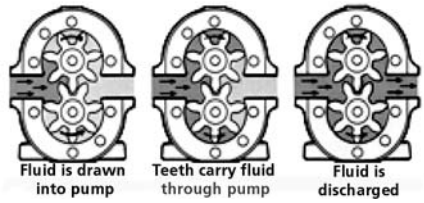
- ***BEARINGS***

  Anti-friction bearings minimize friction and provide higher load ratings for medium to high pressure service. Anti-friction and sleeve type bearings are replaceable.

- ***SEALS***

  Lip seal provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



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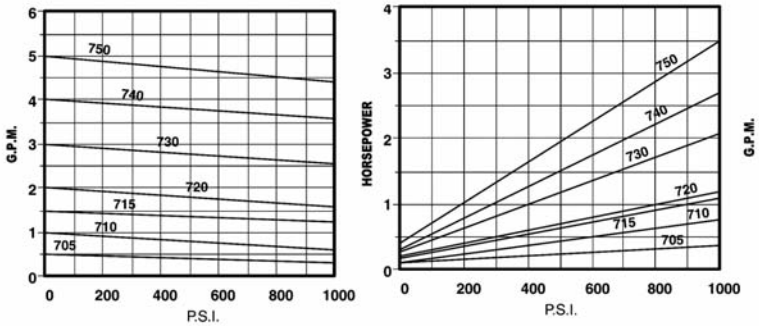
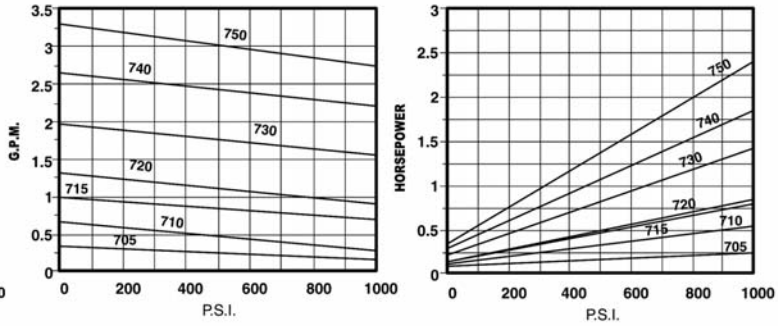
FLOW CURVES

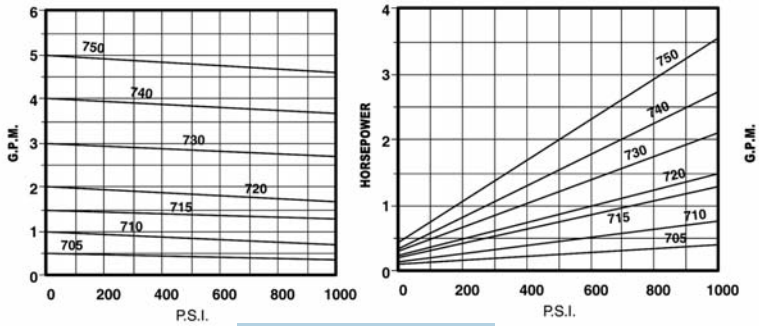
1725 RPM- 70 SSU LIQUID



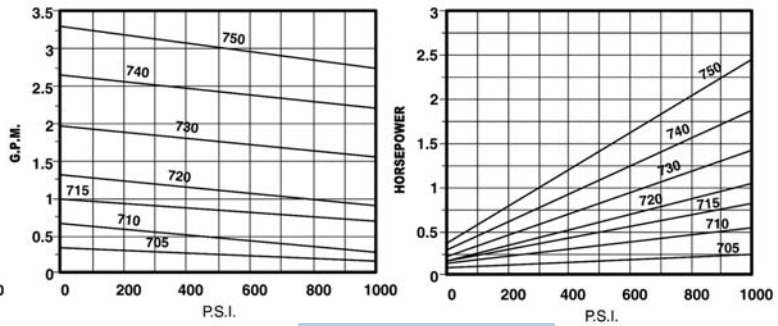
1140 RPM- 70 SSU LIQUID



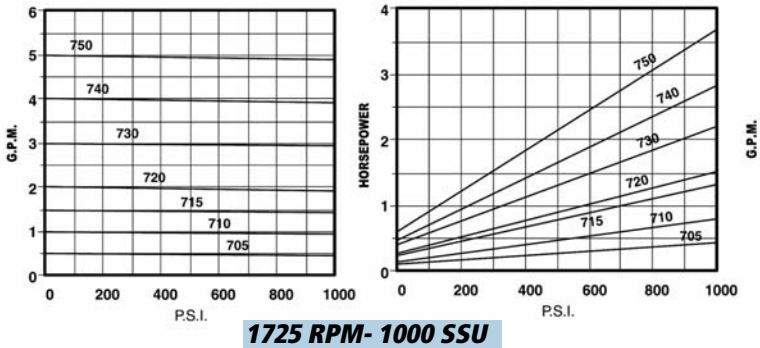
1725 RPM- 100 SSU



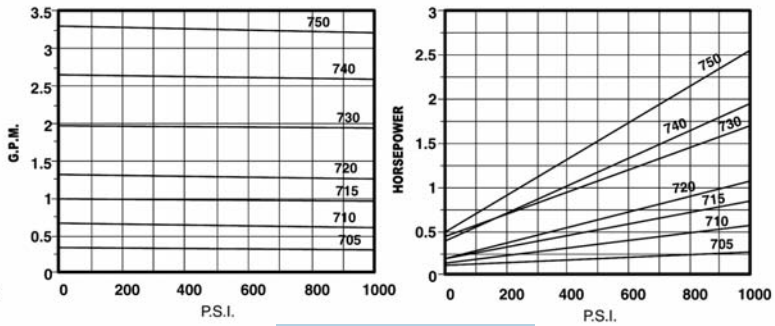
1140 RPM- 100 SSU



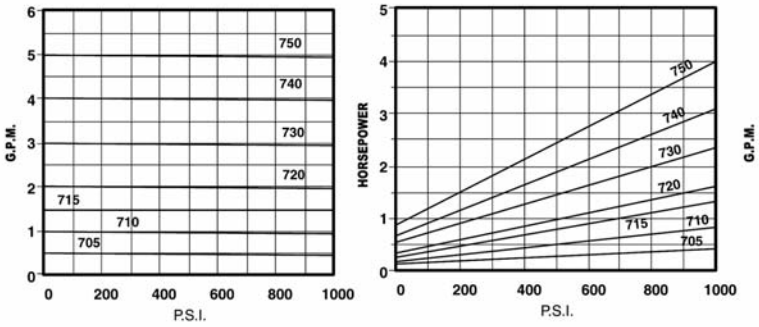
1725 RPM- 500 SSU



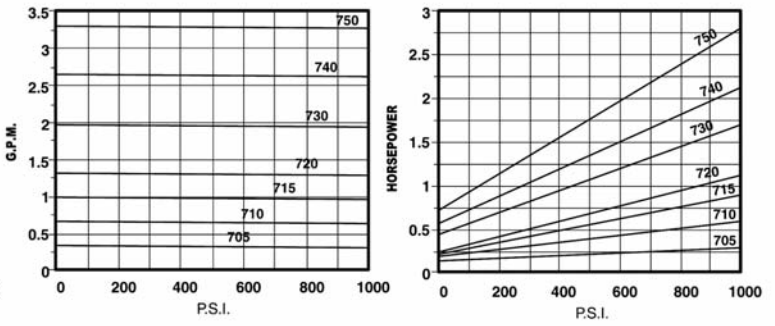
1140 RPM- 500 SSU



1725 RPM- 1000 SSU



1140 RPM- 1000 SSU



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PUMP DIMENSIONS (INCHES)

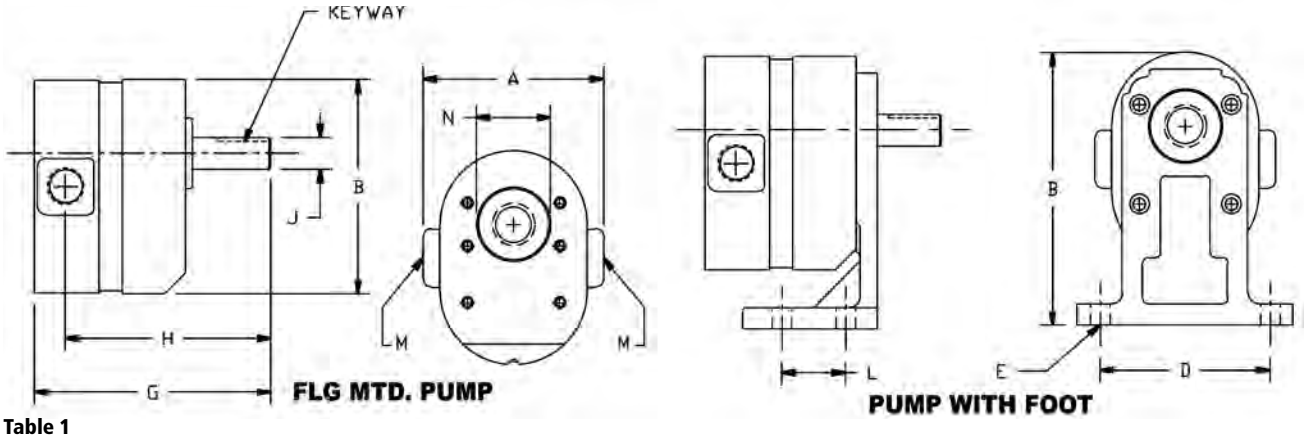


Table 1

Model	A	B	D	E	G	H	J	L	M	N	Keyway
705	3.19	4.81	3.00	11/32	3.84	3.27	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
710	3.19	4.81	3.00	11/32	3.95	3.38	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
715	3.19	4.81	3.00	11/32	4.05	3.47	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
720	3.19	4.81	3.00	11/32	4.14	3.56	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
730	3.19	4.81	3.00	11/32	4.34	3.77	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
740	3.19	4.81	3.00	11/32	4.55	3.97	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8
750	3.19	4.81	3.00	11/32	4.75	4.17	0.56	1.13	3/8 NPT	1.25	1/8 X 1/16 X 7/8

OPERATING CHARACTERISTICS

Delivery and horsepower are based on liquid viscosity if 100 SSU at speed and pressures shown.

Table 2

Model	Gallons per Revolution	Slip GPM/PSI	Drive Speed RPM	0 PSI		500 PSI		1000 PSI		1500 PSI		2000 PSI	
				GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
705	0.0003	0.00013	1725	0.50	0.11	0.43	0.25	0.37	0.40	0.31	0.55	-	-
710	0.0006	0.0002	1725	1.00	0.14	0.90	0.45	0.80	0.77	0.70	1.12	0.60	1.45
715	0.0009	0.0002	1725	1.50	0.21	1.40	0.65	1.30	1.30	1.20	1.68	1.10	2.20
720	0.0012	0.0002	1725	2.00	0.25	1.90	0.85	1.80	1.50	1.70	2.22	1.60	2.90
730	0.0018	0.0003	1725	3.00	0.31	2.85	1.15	2.70	2.10	2.55	3.10	-	-
740	0.0024	0.0003	1725	4.00	0.36	3.85	1.47	3.70	2.75	3.63	3.37	-	-
750	0.0030	0.0004	1725	5.00	0.45	4.80	1.90	4.60	3.55	-	-	-	-

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR(SMALL BRACKET)

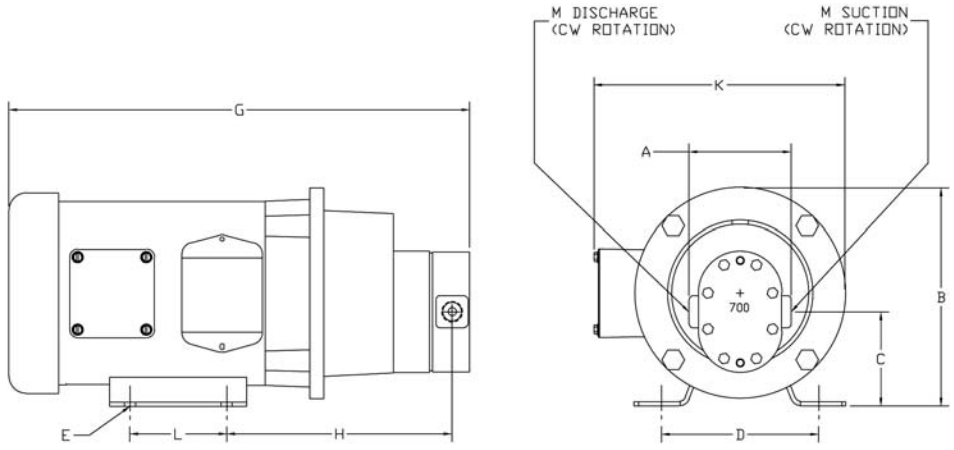


Table 3

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M
705-SB	56C	3.16	6.88	2.92	4.88	0.34	14.28	6.98	8.31	3.00	3/8 NPT
710-SB	56C	3.16	6.88	2.92	4.88	0.34	14.38	7.08	8.31	3.00	3/8 NPT
715-SB	56C	3.16	6.88	2.92	4.88	0.34	14.48	7.18	8.31	3.00	3/8 NPT
720-SB	56C	3.16	6.88	2.92	4.88	0.34	14.58	7.28	8.31	3.00	3/8 NPT
730-SB	56C	3.16	6.88	2.92	4.88	0.34	14.78	7.48	8.31	3.00	3/8 NPT
740-SB	56C	3.16	6.88	2.92	4.88	0.34	14.98	7.68	8.31	3.00	3/8 NPT
750-SB	56C	3.16	6.88	2.92	4.88	0.34	15.18	7.88	8.31	3.00	3/8 NPT

PUMP DIMENSIONS (INCHES) DIRECT COUPLED TO STANDARD C-FACE MOTOR (A-DRIVE)

700 Series pumps are available direct coupled to a NEMA C-Face foot mounted motor. This assembly, referred to as an A-Drive, ensures accurate alignment and requires less space and is less costly than a pump and motor mounted on a baseplate.

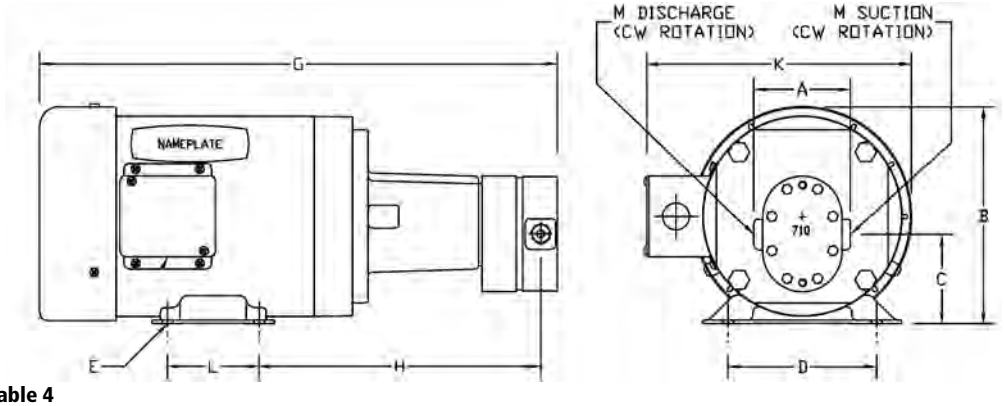


Table 4

Model	Motor Frame	A	B	C	D	E	G	H	K	L	M
705A	56C	3.16	6.88	2.92	4.88	0.34	16.86	9.13	8.31	3.00	3/8
710A	56C	3.16	6.88	2.92	4.88	0.34	16.96	9.23	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	18.68	9.54	8.56	5.00	3/8
745A	56C	3.16	6.88	2.92	4.88	0.34	17.06	9.33	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	18.78	9.54	8.56	5.00	3/8
	182TC	3.16	8.69	3.92	7.50	0.41	20.31	10.83	9.81	4.50	3/8
	184TC	3.16	8.69	3.92	7.50	0.41	20.31	10.83	9.81	5.50	3/8
720A	56C	3.16	6.88	2.92	4.88	0.34	17.16	9.43	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	18.88	9.74	8.56	5.00	3/8
	182TC	3.16	8.69	3.92	7.50	0.41	20.41	10.93	9.81	4.50	3/8
	184TC	3.16	8.69	3.92	7.50	0.41	20.41	10.93	9.81	5.50	3/8
730A	56C	3.16	6.88	2.92	4.88	0.34	17.36	9.63	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	19.08	9.91	8.56	5.00	3/8
	182TC	3.16	8.69	3.92	7.50	0.41	20.61	11.13	9.81	4.50	3/8
	184TC	3.16	8.69	3.92	7.50	0.41	20.61	11.13	9.81	5.50	3/8
	213TC	3.16	10.25	4.67	8.50	0.41	22.52	12.01	12.16	5.50	3/8
740A	56C	3.16	6.88	2.92	4.88	0.34	17.56	9.83	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	19.28	10.14	8.56	5.00	3/8
	182TC	3.16	8.69	3.92	7.50	0.41	20.81	11.33	9.81	4.50	3/8
	184TC	3.16	8.69	3.92	7.50	0.41	20.81	11.33	9.81	5.50	3/8
	213TC	3.16	10.25	4.67	8.50	0.41	22.72	12.21	12.16	5.50	3/8
750A	56C	3.16	6.88	2.92	4.88	0.34	17.76	10.03	8.31	3.00	3/8
	145TC	3.16	6.88	2.92	5.50	0.34	19.48	10.34	8.56	5.00	3/8
	182TC	3.16	8.69	3.92	7.50	0.41	21.01	11.53	9.81	4.50	3/8
	184TC	3.16	8.69	3.92	7.50	0.41	21.01	11.53	9.81	5.50	3/8
	213TC	3.16	10.25	4.67	8.50	0.41	22.92	12.41	12.16	5.50	3/8

ORDERING INFORMATION

ORDER PUMP ONLY 713-A-B-E **ORDER PUMP & DRIVE 713-A-B-C-E** **ORDER PUMP,DRIVE & MOTOR 713-A-B-C-D-E**

A		B	C	D
Pump Model Select Flange or Foot Mount		**Direction of Rotation**	**Pump/Motor Drive**	***Standard C Frame Motors**
Flange Mount (also used with A-Drive assembly) 9705= Model 705 pump 9710= Model 710pump 9715= Model 715 pump 9720= Model 720 pump 9730= Model 730 pump 9740= Model 740 pump 9750= Model 750 pump	**Foot Mount** 705= 705 710= 740 715= 715 720= 720 730= 730 740= 740 750= 750	2=Clockwise 3= Counter-clockwise	1) Select Model & Motor Frame From Tables 3 or 4 2) Choose Factory or Field Assembly. -=Field A=Factory Example: 730A-182TCA	1) Specify Motor Horsepower 2)Specify Motor Speed 3) Specify Electrics **HP** **RPM** **Electrics** **Enclosure** 1=0.5 A=1725 1=230/460, 3/60 A=TEFC 2=0.75 B=1140 3=1.0 4=1.5 5=2.0 6=3.0 7=5.5 Example: 3-B-1-A *Call us with your motor requirements, many other electrics, enclo-

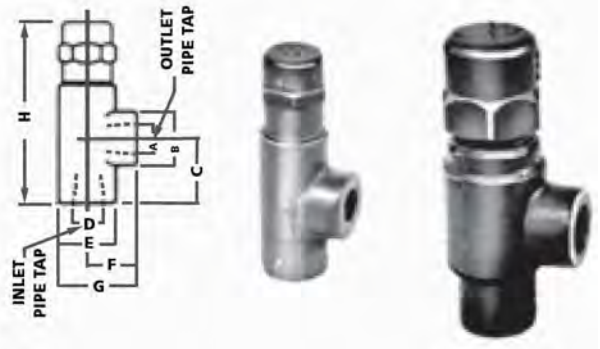
E- Options
Opt 1= Ductile Iron Casing

CLARK SOLUTIONS

Rotary Gear Pump Accessories

Pressure Relief Valves, Strainers & Replacement Parts

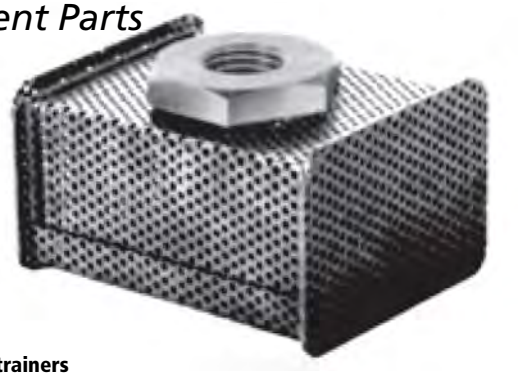
External Relief Valve: The 1/4" to 3/4" relief valves are suitable for pressure settings up to 100 PSI. Higher pressure settings are possible by changing the spring. The 1" relief valve is suitable for pressure settings up to 200 PSI.



Size (Inches)	A	B	C	D	E	F	G	H	Order Number
1/4	1/4	1	1-1/4	1/4	1	15/16	1-7/16	3-5/8	713-9001-20
3/8	3/8	1-1/4	1-7/16	3/8	1-1/4	1-1/8	1-3/4	4-3/16	713-9001-21
1/2	1/2	1-3/8	1-9/16	1/2	1-3/8	1-1/4	1-15/16	4-9/16	713-9001-22
3/4	3/4	1-5/8	2	3/4	1-5/8	1-1/2	2-5/16	5-3/16	713-9001-23
1	1	2	2-3/4	2	2	2-1/4	3-9/16	7-11/16	713-9001-24

Gear Sets & Repair Kits Each repair kit consists of the following components: (1) housing; (1) gear set; (4) bearings; (1) mechanical seal or (1) set of compression packing (specify Suffix CP at end of repair kit part number).

Pump Model	Gear Set P/N	Repair Kit P/N
OO	713-9000-205	713-9000-280 (CP)
1 & 11	713-9001-105	713-9001-280 (CP)
2 & 12	713-9002-105	713-9002-280 (CP)
3 & 13	713-9003-105	713-9003-280 (CP)
4	713-9004-105	713-9004-280 (CP)
1S	713-9010-205	713-9010-280 (CP)
2S	713-9020-205	713-9020-280 (CP)
3S	713-9030-205	713-9030-280 (CP)
4S	713-9040-205	713-9040-280 (CP)
5S	713-9050-205	713-9050-280 (CP)
6S	713-9060-205	713-9060-280 (CP)
8S	713-9080-205	713-9080-280 (CP)
10S	713-9100-205	713-9100-280 (CP)
12S	713-9120-205	713-9120-280 (CP)
14S	713-9140-205	713-9140-280 (CP)
21	713-9021-405	713-9021-280 (CP)
22	713-9022-405	713-9022-280 (CP)
23	713-9023-405	713-9023-280 (CP)
24	713-9024-405	713-9024-280 (CP)
53	713-9053-205	713-9053-280 (CP)
55	713-9055-205	713-9055-280 (CP)
507	713-9507-305	713-9507-280 (CP)
511	713-9511-305	713-9511-280 (CP)
517	713-9517-305	713-9517-280 (CP)
525	713-9525-305	713-9525-280 (CP)
537	713-9537-305	713-9537-280 (CP)
547	713-9547-305	713-9547-280 (CP)
557	713-9557-305	713-9557-280 (CP)
567	713-9567-305	713-9567-280 (CP)
1SST	713-9010-205-SS	713-9010-280-SS (CP)
2SST	713-9020-205-SS	713-9020-280-SS (CP)
3SST	713-9030-205-SS	713-9030-280-SS (CP)
4SST	713-9040-205-SS	713-9040-280-SS (CP)
5SST	713-9050-205-SS	713-9050-280-SS (CP)



Strainers

Order Number	Size (inches)	Pipe Connection
713-9008-10	3-1/8 x 2-3/8 x 1-5/8	1/4
713-9001-11	4-5/8 x 3-1/8 x 1-7/8	3/8
713-9002-12	6-1/8 x 3-5/8 x 2-3/8	1/2
713-9003-13	7-1/8 x 4-5/8 x 3-1/8	3/4

Renewable Bearings

Pump Model	Bearing P/N
1,11 & 1S	713-9001-107 (Set of 4)
2,12 & 2S	713-9002-107 (Set of 4)
3,4,13,3S,4S & 5S	713-9003-107 (Set of 4)
53 & 55	423-1646(Set of 3) 423-1647(Set of 1)
6S	423-11 (Set of 4)
8S & 10S	423-9 (Set of 4)
12S & 14s	423-10 (Set of 4)
507, 508, 511 & 512	713-9507-107 (Set of 4)
517, 518, 525 & 525	713-9517-107 (Set of 4)
537, 538, 547, 557, 558 & 567	713-9537-107 (Set of 4)
700 Series	422-39 (Set of 4)
1SST	213-1-108 (Set of 4)
2SST	213-2-108 (Set of 4)
3SST, 4SST & 5SST	213-3-108 (Set of 4)

***Mechanical Seals**

Pump Model	Seal P/N
1 & 1S	713-9010-270
2 & 2S	713-9020-270
3, 4, 3S, 4S & 5S	713-9030-270
6S	466-137-2
8S, 10S	466-292
12S, 14S	466-143-2
502, 504, 507, 508, 511 & 512	713-9507-270
517, 518, 525 & 526	713-9517-270
537, 538, 547, 557, 558 & 567	713-9537-270
1SST	713-9010-270SST
2SST	713-9020-270SST
3SST, 4SST & 5SST	713-9030-270SST

***Lip Seals**

Pump Model	Seal P/N
00	466-3948
700Series	466-279 (Buna N)
700 Series	215-10118 (Viton)

Compression Packing

Pump Model	Packing P/N
1, 1S, 11, 21 & 1SST	466-3161-4 or 466-192 (Teflon)
2, 2S, 12, 22 & 2SST	466-3162-4 or 466-193 (Teflon)
3, 3S, 4S, 5S, 13, 23, 24, 3SST, 4SST, 5SST	466-3163-4 or 466-194 (Teflon)

*** Avaliable with different elastomers, consult us**

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CLARK

KPM Square Series Miniature Gas Pumps

DC Power, Pressure to 350 mmHg

DESCRIPTION

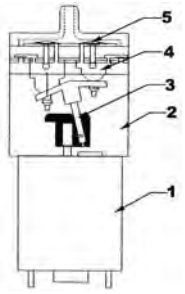
The KPMS series pumps incorporate two mini-diaphragms operated by a rocker arm attached to an eccentric on a motor shaft. The function is simple and reliable.

KPMS pumps are remarkably small, with overall length less than 43 mm. In addition to small size and light weight they offer excellent performance considering their very low cost.

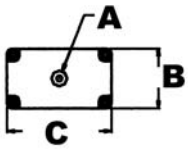
KPMS pumps are offered in two models and are only offered for OEM applications. Samples are available for the qualified OEM so that application suitability can be determined.

SPECIFICATIONS

GENERAL	KPM-08A-3A	KPM-12A
Rated Voltage	3 VDC	3 VDC
Operating Voltage	2.0-3.2 V	2.0-3.2 V
Rated Current	<300 mA	<460 mA
Typ. Max Pressure	>300 mmHg	>350 mmHg
Typ. Max Flow (No Back Pressure)	>0.5 LPM	>1.0 LPM
Typ. Max Flow (@150 mmHg)	<0.35 LPM	<0.4 LPM
Typ. Startup Voltage (200 mmHg)	2V	2V
Operating Temp. Range	5-45^{0}C	5-45^{0}C
Operating Humidity Range	30 TO 80% RH	30 TO 80% RH
Duty Cycle	Intermittent	Intermittent
Typ Noise	65 dB (30 cm away)	65 dB (30 cm away)
Typ. Life	150 HRS	150 HRS
Tube Barb O.D.	3 MM O.D.	3 MM O.D.



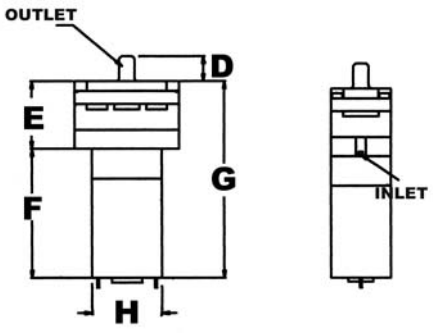
1) DC Motor
2) Plastic Body
3) Steel Pin
4) Rubber Diaphragm
5) Rubber Umbrella Valve



DIMENSIONS (MM)

MODEL	A	B	C	D	E	F	G	H	I	J
KPM-08A-3A	3.1	8.0	17.8	5.0	13.6	18.4	32.0	10.0	4.0	-
KPM-12A	3.1	12.0	21.0	5.0	13.6	24.6	38.2	14.0	6.0	11.8

Note: Above dimensions are for general sizing and reference purposes only. Please request specific model drawing for precise dimensions with tolerances.

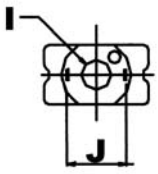


ORDERING INFORMATION

SELECT MODEL NUMBER

Model
KPM-08A-3A
KPM-12A

These items typically ship from stock



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CLARK

Pressure/Vacuum Pump Model 015 LC

DC Powered Diaphragm Type

DESCRIPTION

Model 015 LC miniature pump is an economical pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications.

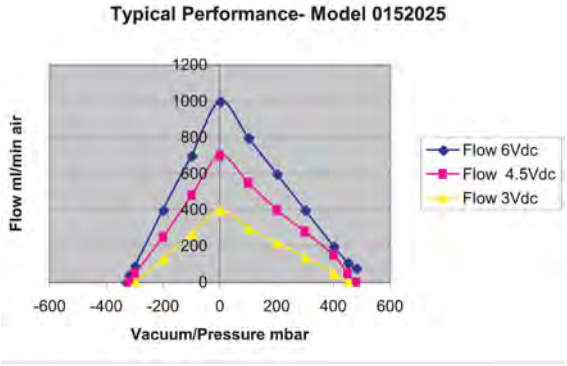
The pump is quiet, reliable and mounts in any position. The unit operates oil free and the available wetted materials offer excellent chemical resistance as well as contamination free pumping.

FEATURES

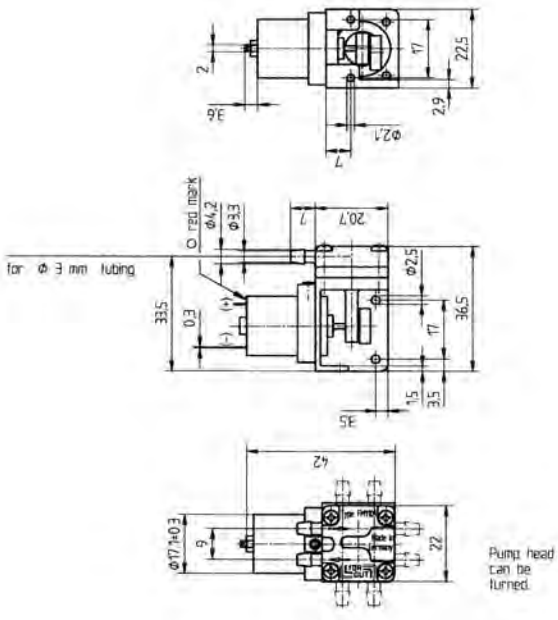
- o Low Noise
- o Low Vibration
- o Minimum Pulsation
- o Diaphragm & Valves Changed Easily

SPECIFICATIONS

Maximum continuous Vacuum- 100mbar (3.0 inches Hg)
Maximum continuous Pressure- 100mbar (1.5 PSIG)
Pump Head Material- Ryton
Diaphragm Material- EPDM, Silicone or Viton
Valve Material- EPDM, Silicone or Viton
Weight- 32 grams



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Diaphragm Material	Valve Material	Voltage	Min. Current (mA)	Max. Current (mA)	Max. Flow (ml/m)	Max. Vac. (mbar)	Max. Press. (mbar)
0152001	Silicone	Silicone	6	80	110	1100	330	380
0152015	EPDM	EPDP	6	90	110	1000	280	350
0152025	Viton	Silicone	6	150	170	1000	330	500
Bold items typically ship from stock								

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CLARK

Pressure/Vacuum Pump Model 011

DC Powered Diaphragm Type

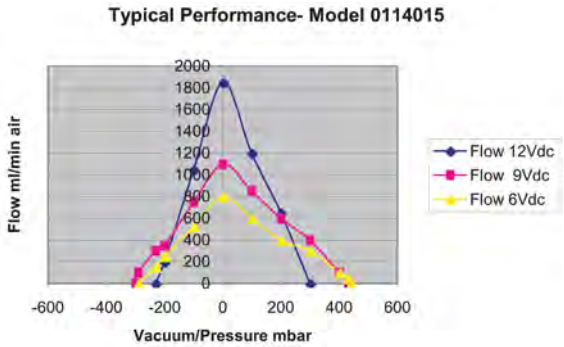
DESCRIPTION

Model 011 miniature pump is a excellent pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications.

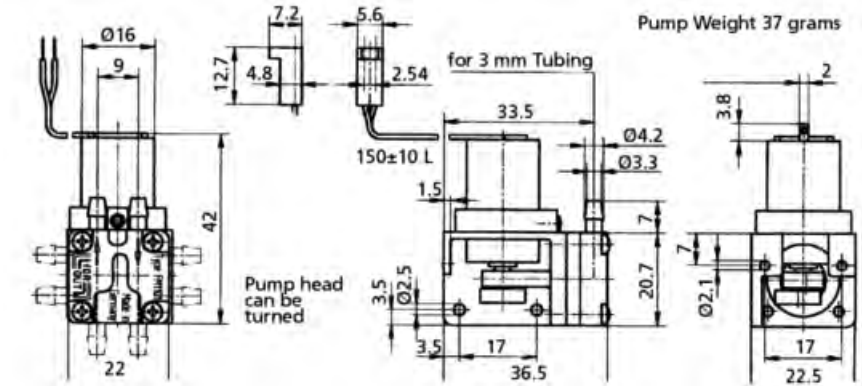
The pump is quiet, reliable and mounts in any position. The unit operates oil free and the available wetted materials offer excellent chemical resistance as well as contamination free pumping.

SPECIFICATIONS

Maximum continuous Vacuum- 100mbar (3.0 inches Hg)
Maximum continuous Pressure- 100mbar (1.5 PSIG)
Pump Head Material- Ryton
Diaphragm Material- EPDM, Silicone or Viton
Valve Material- EPDM, Silicone or Viton



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Diaphragm Material	Valve Material	Voltage	Min. Current (mA)	Max. Current (mA)	Max. Flow (ml/m)	Max. Vac. (mbar)	Max. Press. (mbar)
0112101	Silicone	Silicone	6	85	90	1250	270	300
0113001	Silicone	Silicone	9	70	75	1500	210	270
0114001	Silicone	Silicone	12	75	80	1700	180	210
0112102	Silicone	Silicone	6	75	90	1300	220	300
0112115	EPDM	EPDM	6	80	90	1200	220	310
0112125	Viton	Silicone	6	140	155	950	300	400
0113015	EPDM	EPDM	9	80	85	1450	270	400
0113025	Viton	Silicone	9	120	130	1300	290	400
0114015	EPDM	EPDM	12	65	70	1850	230	300
0114025	Viton	Silicone	12	80	85	1700	260	290
0115001	Silicone	Silicone	15	45	50	1100	250	330
0115015	EPDM	EPDM	15	50	55	1400	280	400
0115025	Viton	Silicone	15	75	80	1400	300	390
0115026	Viton	Viton	15	75	80	850	220	280
0116001	Silicone	Silicone	18	30	35	1200	200	300
0116015	EPDM	EPDM	18	35	45	1200	350	500
0116025	Viton	Silicone	18	50	55	1100	320	450
0116026	Viton	Viton	18	45	55	800	160	220

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BOXER

12K Series Diaphragm Pump

Gas Flow Rate to 1.2 l/m

DESCRIPTION

This tiny powerful pump introduces the novelty of a field changeable pump head design to the market.

By undoing two screws the user or service engineer can swap the head of the pump. This is ideal in applications that require quick replacement of all wetted parts following contamination.

The 12K is available with either the economically priced iron core motor or with long life coreless DC motors.

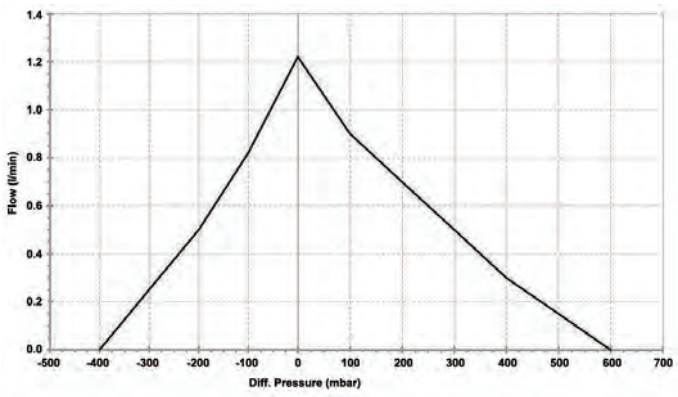
Like all other pumps in the Boxer range, this series can be customized to specific requirements. Components are produced in a wide variety of materials.

SPECIFICATIONS

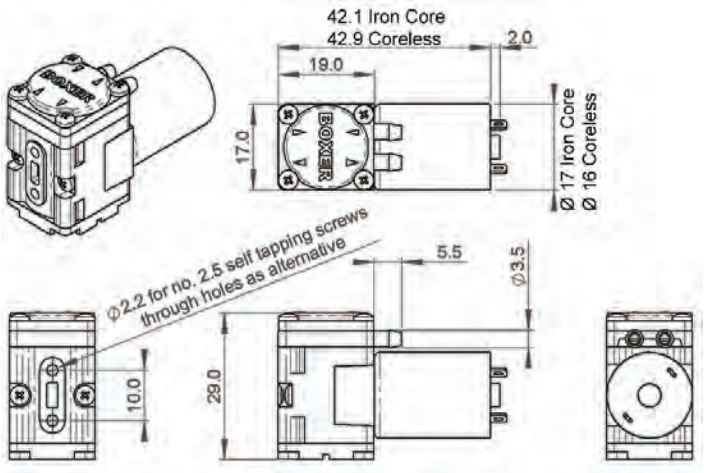
GENERAL

Free Flow: 1.2 l/m
Max Pressure: 600 mbar (8.7 PSI)
Max Vacuum: -400 mm mercury (15.7 inches mercury)
Motor:
  Iron Core- 4.5 & 6.5 VDC
  Coreless- 4.0, 7.0, 9.0, 13.5, & 18 VDC
Life Expectancy Iron Core Motor- 4500 hours, subject to operating environment
Life Expectancy Coreless Motor- 12000 hours, subject to operating environment
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 3.5 mm ID tubing
Weight: 35g

FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
1211.204	Iron Core	4.5	4.5
1211.200	Iron Core	6.5	6.5
1211.112	Coreless	4	6
1211.113	Coreless	7	9
1211.114	Coreless	9	12
1211.110	Coreless	13.5	18
1211.111	Coreless	18	24
1211.111	Silicone Boot for Coreless Motors		

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BOXER

1K Series Diaphragm Pump

Gas Flow Rate to 1.8 l/m

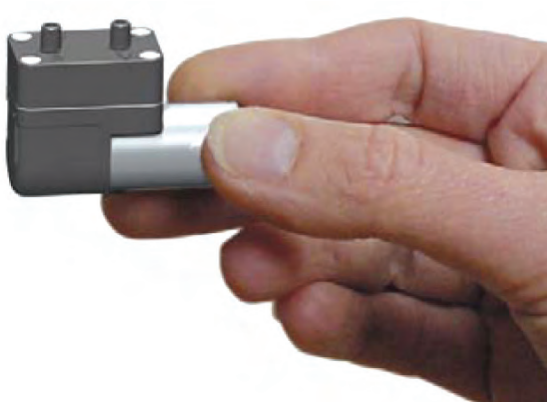
DESCRIPTION

1K series pumps are designed for gas sampling applications and, like all other pumps in the Boxer range, can be customized to meet specific requirements.

The pumps have an outstanding flow to size ratio, and run at only 3000 rpm, ensuring long life.

The 1K series is currently the smallest miniature diaphragm pump in the Boxer range. The components are produced in a wide variety of materials providing compatibility with a wide range of applications.

This series is available in iron core and coreless motor options.

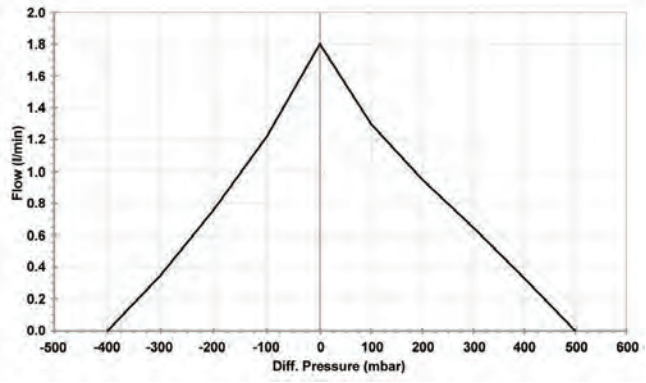


SPECIFICATIONS

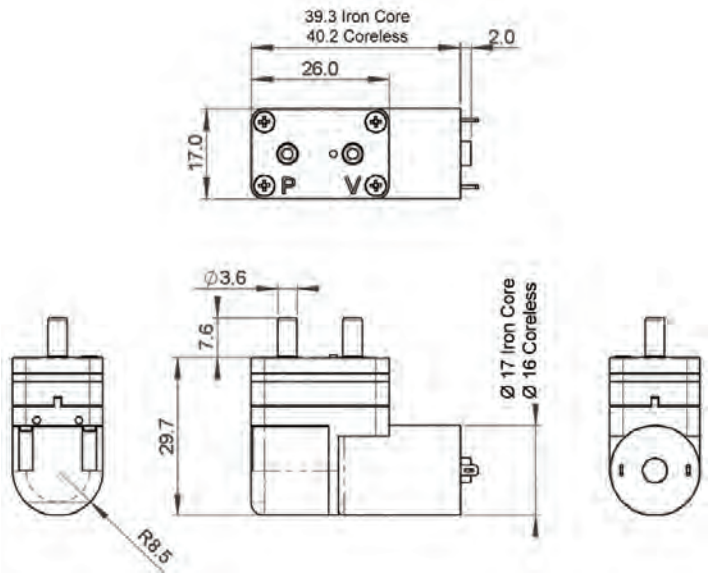
GENERAL

Free Flow: 1.8 l/m
Max Pressure: 500 mbar (7.25 PSI)
Max Vacuum: -400 mm mercury (15.7 inches mercury)
Motor:
  Iron Core- 4.5 & 6.5 VDC
  Coreless- 4.0, 7.0, 9.0, 13.5, & 18 VDC
Life Expectancy Iron Core Motor- 4500 hours, subject to operating environment
Life Expectancy Coreless Motor- 12000 hours, subject to operating environment
Housing Material: PPO (Polyphenylene Oxide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 3 mm ID tubing
Weight; 29g

FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
1002.045	Iron Core	4.5	4.5
1003.065	Iron Core	6.5	6.5
1007.001	Coreless	4	6
1007.002	Coreless	7	9
1007.003	Coreless	9	12
1007.004	Coreless	13.5	18
1007.005	Coreless	18	24
1000.8	Silicone Boot for Coreless Motors		

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BOXER

12K Series Diaphragm Pump

Gas Flow Rate to 1.2 l/m

DESCRIPTION

This tiny powerful pump introduces the novelty of a field changeable pump head design to the market.

By undoing two screws the user or service engineer can swap the head of the pump. This is ideal in applications that require quick replacement of all wetted parts following contamination.

The 12K is available with either the economically priced iron core motor or with long life coreless DC motors.

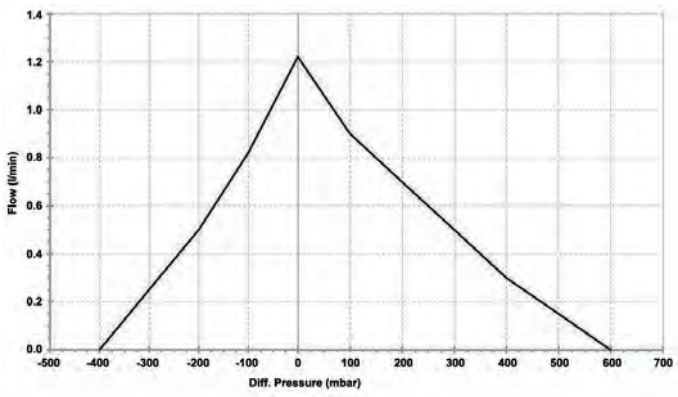
Like all other pumps in the Boxer range, this series can be customized to specific requirements. Components are produced in a wide variety of materials.

SPECIFICATIONS

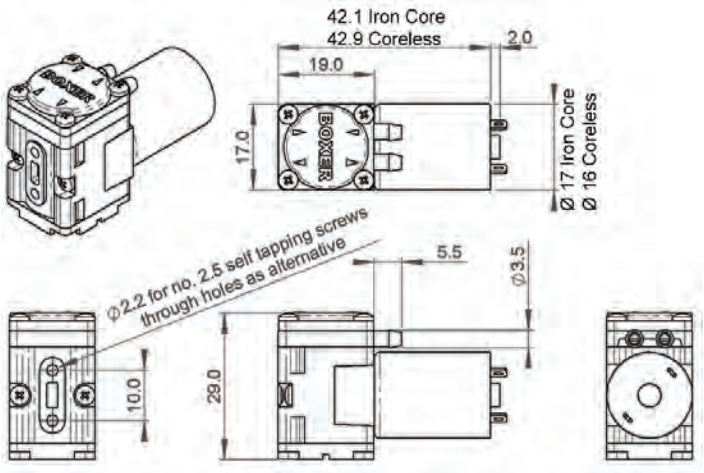
GENERAL

Free Flow: 1.2 l/m
Max Pressure: 600 mbar (8.7 PSI)
Max Vacuum: -400 mm mercury (15.7 inches mercury)
Motor:
  Iron Core- 4.5 & 6.5 VDC
  Coreless- 4.0, 7.0, 9.0, 13.5, & 18 VDC
Life Expectancy Iron Core Motor- 4500 hours, subject to operating environment
Life Expectancy Coreless Motor- 12000 hours, subject to operating environment
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 3.5 mm ID tubing
Weight: 35g

FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
1211.204	Iron Core	4.5	4.5
1211.200	Iron Core	6.5	6.5
1211.112	Coreless	4	6
1211.113	Coreless	7	9
1211.114	Coreless	9	12
1211.110	Coreless	13.5	18
1211.111	Coreless	18	24
1211.111	Silicone Boot for Coreless Motors		

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NAMIKI

Model 8018GT Miniature Diaphragm Air Pumps

Chemically Resistant, Vac. to 563 mm Hg, Pressure to 1.7 bar, Flow to 2000 ml/min

DESCRIPTION

Model 8018GT air diaphragm pump is an excellent choice where chemical resistance, plastic wetted components, DC power operation and quiet, reliable performance are required. It is typically used on medical eqipment, laboratory automated chemistry applications, environmental sampling equipment and a range of industrial applications such as pick-and-place operations, ink jet printer systems and food packaging equipment.

Model 8018GT pump incorporates a 24 V Namiki brushless DC motor with integrated sensor drive type circuit. The motor shaft incorporates an eccentric that is attached to the pump diaphragm. Two opposing floating discs with seats respond to the diaphragm motion resulting in pumping action.

The pump is produced by Namiki Corporation, a world leader in DC motor production and technology.

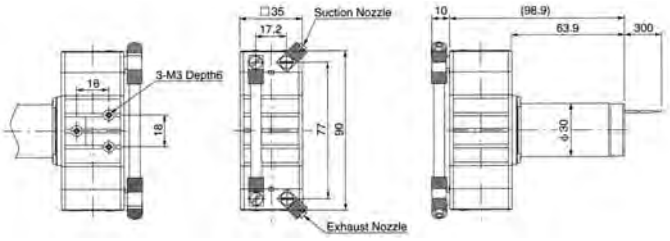
SPECIFICATIONS

GENERAL

Ports: Hose nozzle (barb) for 3-4 mm I.D. tubing,
Pump Body: POM
Seal & Valve Material: FKM
Diaphragm Material: FKM
Ambient & Fluid Temperature Range: 0 to 50°C

Maximum Flow Rate: 2000 ml/min
Exhaust Pressure Range: 0 to 1.7 bar (24.7 PSI)
Suction Pressure Range: 0 to -563 mm Hg
Motor: Namiki 24VDC brushless with integrated sensor drive circuit type
Nominal Current Consumption: 200 mA
Weight: 360g

DIMENSIONS (MM)



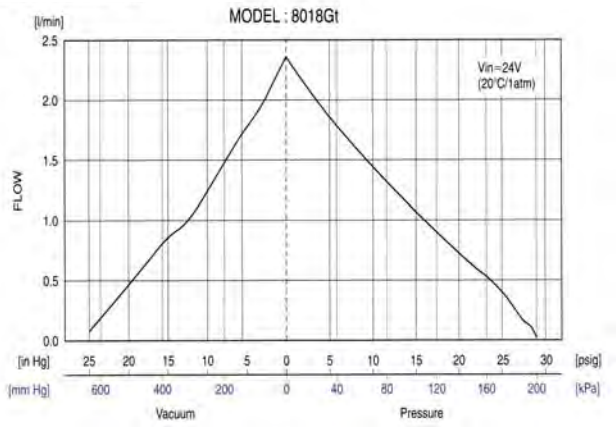
ORDERING INFORMATION

ORDER NUMBER

8018GT

Please call us to discuss any special wetted material requirements or additional requirements.

FLOW CURVE



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BOXER
Series 11K Diaphragm Pumps
Gas to 2.6 l/min, DC Motor

DESCRIPTION

The 11K gas pumps are commonly applied for gas sampling applications.

With 2.0 l/min flow rate or greater, the Boxer 1100 has a unique flow to size ratio. The 11K, like all others of the Boxer range of pumps, can be tailored to your special requirements. The components can be produced in a wide range of materials, providing compatibility within a wide range of applications. Wetted path is free of any metal.

Model 1100.200

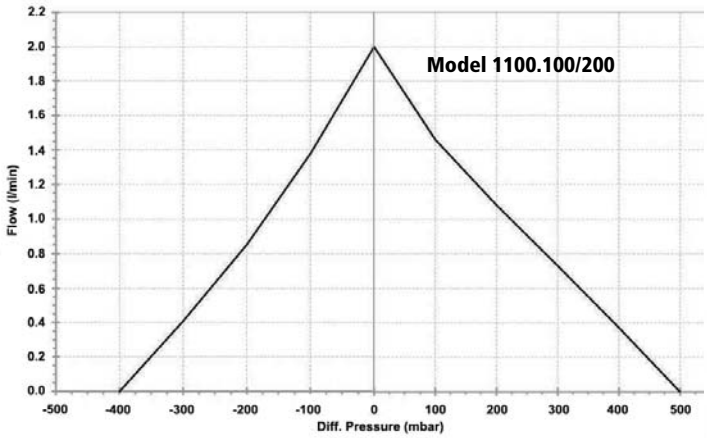
Our access to a variety of DC motors ensures that we are able to optimize the pump's performance for a minimal power consumption. The 11K pumps are ideal for battery operated applications.

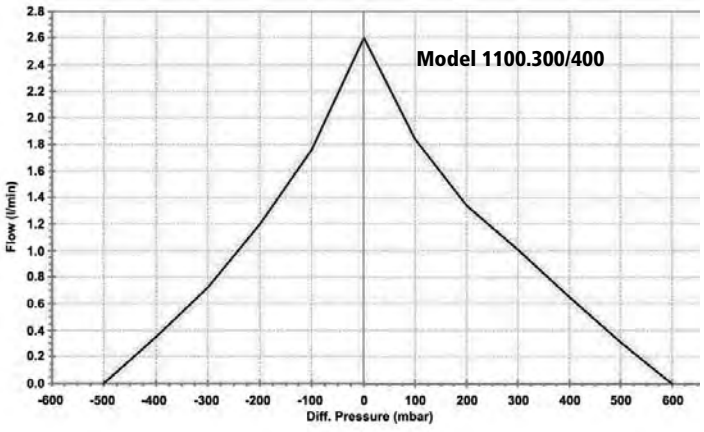
This series is available in iron core (2 versions), coreless and brushless DC (2 versions) motor options. Optional motor driver with integrated speed control is available for brushless versions.

	Model 1100.100	Model 1100.200	Model 1100.300/400
Motor	Coreless: 4, 7, 9 & 13.5 VDC	Iron Core: 12 & 24 VDC	Brushless: 24VDC
Free Flow	2 LPM (at 75% nominal pump voltage)	2 LPM	2.6 LPM- Regulation of flow via on-board trimmer
Max Pressure-Gas	225 mBar	500 mBar	600 mBar
Max Vacuum-Gas	-225 mBar	-400 mBar	-500 mBar
Tube Connection	4.8 mm OD Barb (for 2.5 to 4 mm ID tubing)		
Body Materials	PPS (Polyphenylene Sulphide)	PPS (Polyphenylene Sulphide)	PPS (Polyphenylene Sulphide)
Diaph. & Valve Material	EPDM	EPDM	EPDM
Weight	38g	54g	61g (without driver)

Model 1100.300 with Driver Board

FLOW CURVES





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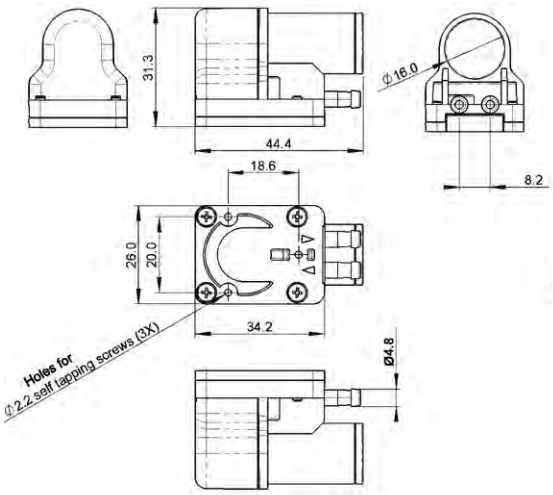
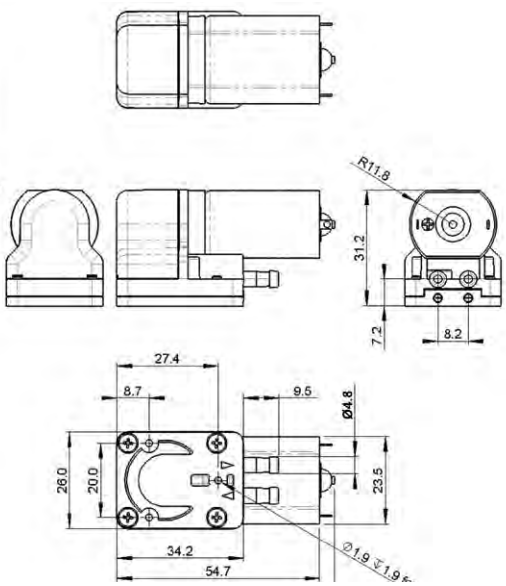
DIMENSIONS (MM)

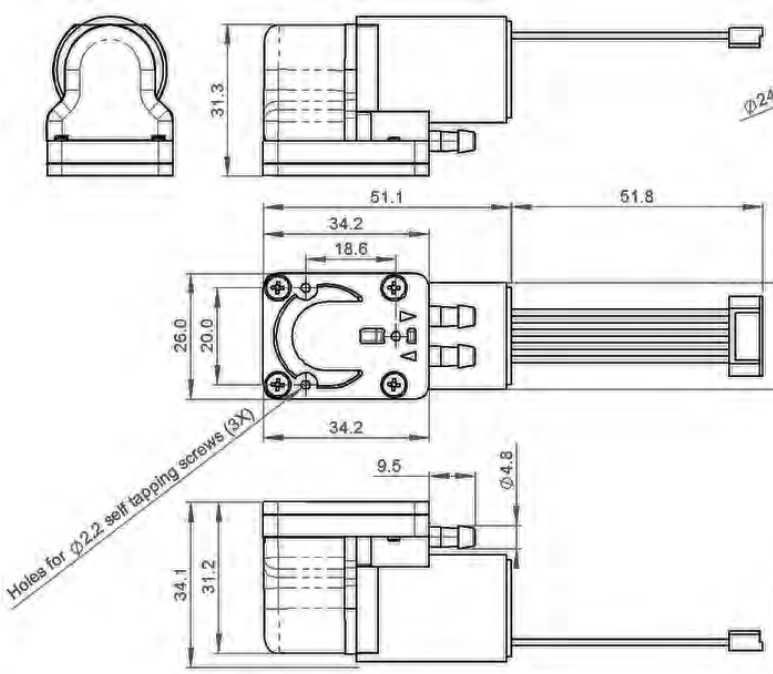
Model 1100.100

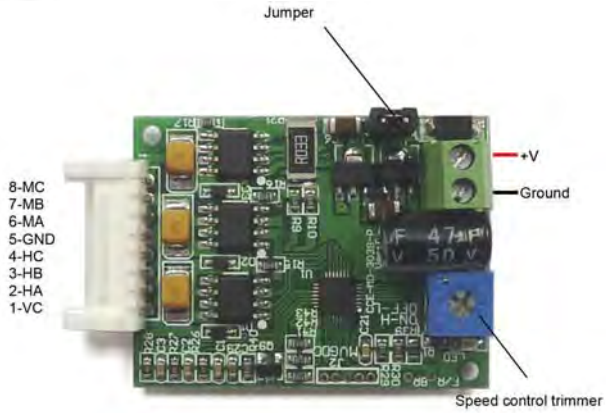


Model 1100.200



Model 1100.300/400





ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
1100.212	Iron Core-Economical	12	12
1100.211	Iron Core	12	12
1100.206	Iron Core	24	24
1100.101	CoreLess	4	6
1100.102	CoreLess	7	9
1100.103	CoreLess	9	12
1100.104	CoreLess	13.5	18
1100.402	Brushless-Economical	24	24
1100.302	Brushless	24	24
6900.005	Electronic driver for 1100.300		

Model 6900.005 Driver Board for Brushless Motors

The board is equipped with a trimmer which allows the regulation of the pump's speed i.e. flow.

For operation at @ 24V remove the jumper.
For operation @ 12V jumper must remain in position.

The boards are generally supplied as 0-6000rpm boards whereby in some instances we customize the boards to run the motors at 1200rpm max speed.

Max permissible temperature on metal surface of motor in continuous operation is 80 °C (185F).

CLARK

KPV 14A & 20A Series Miniature Gas Vacuum Pumps

DC Power, Vacuum to150 mmHg

DESCRIPTION

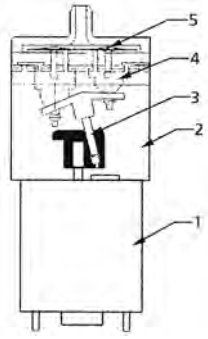
The KPV series pumps incorporate two mini-diaphragms operated by a rocker arm attached to an eccentric on a motor shaft. The function is simple and reliable.

At 42 mm (1.68”) and 55 mm (2.2”) in length, KPV14-A and 20A pumps are remarkably small. In addition to small size and light weight they offer excellent performance considering their very low cost.

KPV vacuum pumps are offered in two models and are only offered for OEM applications. Samples are available for the qualified OEM so that application suitability can be determined.

SPECIFICATIONS

GENERAL	KPV-14A	KPV-20A
Rated Voltage	6 VDC	6 VDC
Rated Current	<220 mA	<450 mA
Typ. Max Vac. Pressure (No Flow)	150 mmHg	150 mmHg
Typ. Max Flow (No Back Pressure)	>0.9 LPM	>2.5 LPM
Typ. Max Flow (@75 mmHg)	>0.9 LPM	>0.8 LPM
Operating Temp. Range	5-45ºC	5-45ºC
Operating Humidity Range	30-80% RH	30-80% RH
Duty Cycle	Intermittent	Intermittent
Typ Noise	<75 dB	<75 dB
Typ. Life	250 HRS	250 HRS
Tube Barb O.D.	3 mm	4.5 mm



1) DC Motor
2) Plastic Body
3) Steel Pin
4) Rubber Diaphragm
5) Rubber Umbrella Valve

ORDERING INFORMATION

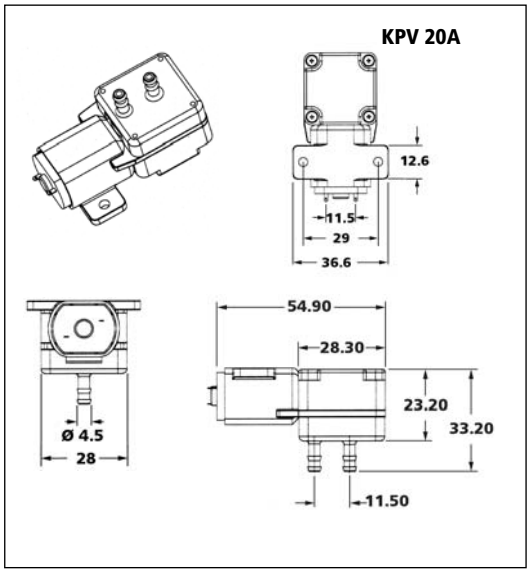
SELECT MODEL NUMBER

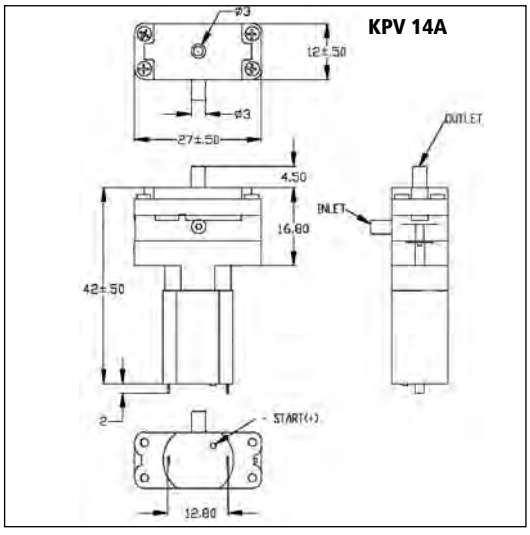
Model

KPV-14A6V
KPV-20A6V

Items typically ship from stock

DIMENSIONS (MM)





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CLARK

KPM Round Series Miniature Gas Pumps

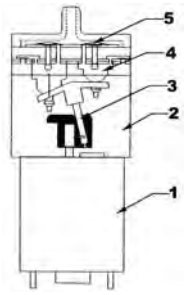
DC Power, Pressure to 300 mmHg (5.8 PSI)

DESCRIPTION

The KPMR series pumps incorporate two mini-diaphragms operated by a rocker arm attached to an eccentric on a motor shaft. The function is simple and reliable.

KPMR pumps are remarkably small, with overall length less than 65 mm. In addition to small size and light weight they offer excellent performance considering their very low cost.

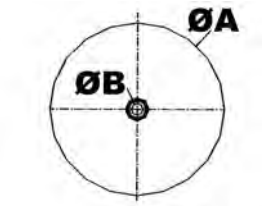
KPMR pumps are offered in two models and are only offered for OEM applications. Samples are available for the qualified OEM so that application suitability can be determined.

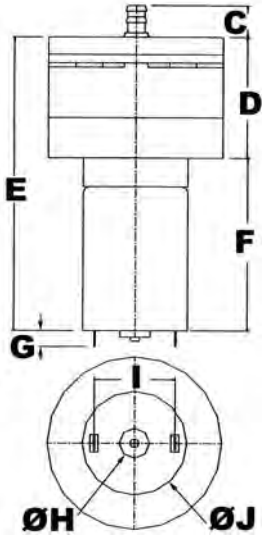


1) DC Motor
2) Plastic Body
3) Steel Pin
4) Rubber Diaphragm
5) Rubber Umbrella Valve

SPECIFICATIONS

GENERAL	KPM-27C-6B3	KPM-32A-12A
Rated Voltage	6 VDC	12 VDC
Operating Voltage	4.0-7.0 V	4.0-13 V
Rated Current	<430 mA	<390 mA
Typ. Max Pressure	300 mmHg	300 mmHg
Typ. Max Flow (No Back Pressure)	>1.8 LPM	>3.5 LPM
Typ. Max Flow (@150 mmHg)	>1.2 LPM	>2.0 LPM
Typ. Startup Voltage (200 mmHg)	4V	6V
Operating Temp. Range	5-45^{0}C	5-45^{0}C
Operating Humidity Range	30 TO 80% RH	30 TO 80% RH
Duty Cycle	Intermittent	Intermittent
Typ Noise	<63 dB (30 cm away)	<60 dB (30 cm away)
Typ. Life	250 HRS	250 HRS
Tube Barb O.D.	4 MM O.D.	4 MM O.D.





DIMENSIONS (MM)

MODEL	A	B	C	D	E	F	G	H	I	J
KPM-27C-6B3	27.0	4.2	6.3	27.0	58.0	31.0	3.5	6.5	18.3	24.2
KPM-32A-12A	32.0	4.2	9.0	31.2	50.2	19.0	3.3	-	20.3	32.0

Note: Above dimensions are for general sizing and reference purposes only. Please request specific model drawing for precise dimensions with tolerances.

ORDERING INFORMATION

SELECT MODEL NUMBER

Model

KPM-27C-6B3
KPM-32A-12A

These items typically ship from stock

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BOXER

2KD Series Diaphragm Pump

Gas Flow Rate to 3.7 l/m

DESCRIPTION

The 2KD series double headed miniature diaphragm pumps are designed for gas sampling and gas detection applications. Two heads allows flexibility of paralllel or series connection to extend the pressure/vacuum capability or to pump 2 distinct gases.

Iron core and coreless DC motor options are offered in this series.

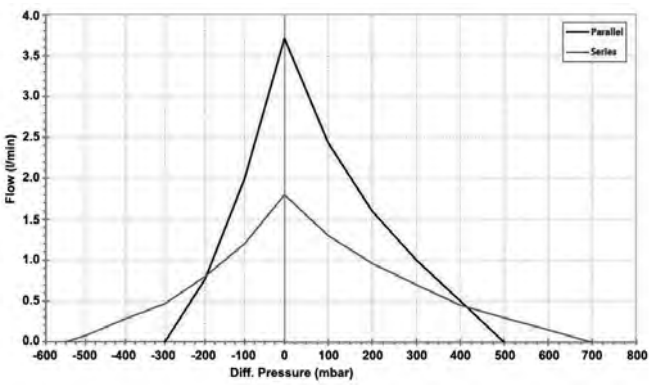
Like all other pumps in the Boxer range, this series can be customized to specific requirements. Components are produced in a wide variety of materials.

SPECIFICATIONS

GENERAL

Free Flow: Parallel, 3.7 l/m; Series, 1.8 l/m
Max Pressure: Parallel, 500 mbar (7.25 PSI), Series, 700 mbar (10.2 PSI)
Max Vacuum: Parallel, -300 mbar (8.86 in. Hg); Series, -550 mbar (16.2 in Hg)
Motor:
  Iron Core- 4.5 & 6.5 VDC
  Coreless- 4.0, 7.0, 9.0, 13.5, & 18 VDC
Life Expectancy Iron Core Motor- 4500 hours, subject to operating environment
Life Expectancy Coreless Motor- 12000 hours, subject to operating environment
Housing Material: PPO (Polyphenylene Oxide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 3.5 mm ID tubing
Weight; 35g

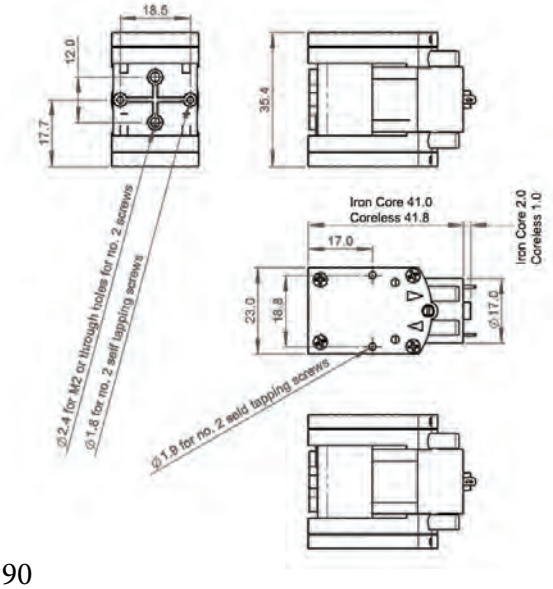
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
2201.001	Iron Core	4.5	4.5
2201.002	Iron Core	6.5	6.5
2200.001	Coreless	4	6
2200.002	Coreless	7	9
2200.003	Coreless	9	12
2200.004	Coreless	13.5	18
2200.005	Coreless	18	24

DIMENSIONS (MM)



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BOXER
19K Series Diaphragm Pump
Gas Flow Rate to 4 l/m

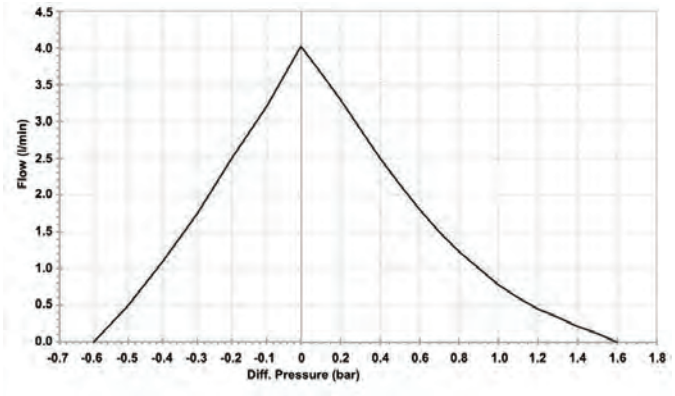
DESCRIPTION
The 19K series single headed gas diaphragm pump offers a combination of high flow performance and damping chambers to reduce pulsation. The 19K a very versatile pump suitable for wide range of applications.

Both brushed and brushless motor options are available.

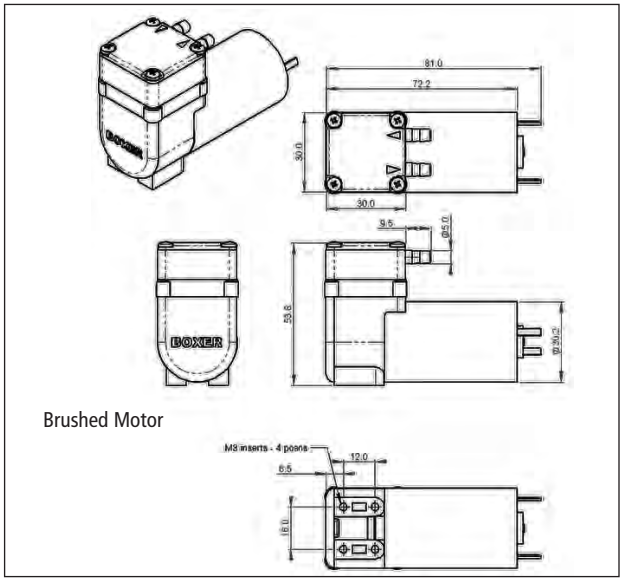
SPECIFICATIONS

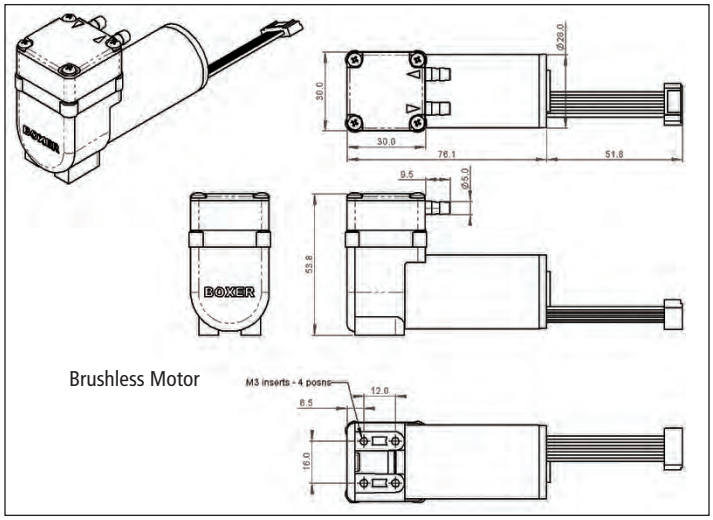
GENERAL
Free Flow: 4.0 l/m
Max Pressure: 1.6 bars (23.2 PSI)
Max Vacuum: -600 mbars (17.7 inches mercury)
Motor:
Brushed Motor- 12 & 24 VDC
Brushless Motor- 24 VDC
Max. Operating Temp.: 50°C
Max Media Temp.: 100°C
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Barb Size: 5 mm OD
Weight; 173g

FLOW CURVE



DIMENSIONS (MM)





ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
19101.001	Brushed Motor	12	12
19101.002	Brushed Motor	24	24
19101.601	Brushless Motor	24	24
6900.005	Driver Board for Brushless motors		

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BOXER

5KS Series Diaphragm Pump

Gas Flow Rate to 5.7 l/m

DESCRIPTION

Boxer 5KS pumps have been designed with portable environmental analyzers and medical devices in mind. An open flow of above 5.5 l/m is available with dimensions of just 5.7 x 4.4 x 3.0 cm and, importantly, this is achieved without excessive motor speeds.

If desired the 5KS can be run at reduced voltage for lower flows normally associated with pumps of this physical size. At these slow running speeds the 5KS offers exceptional low noise and extended motor life.

Iron core and coreless DC motor options are offered in this series. Like all other pumps in the Boxer range, this series can be customized to specific requirements. Components are produced in a wide variety of materials.

SPECIFICATIONS

GENERAL

Free Flow:
- Iron Core E: 5.7 l/m
- Iron Core: 5.1 l/m
- Coreless: 5.5 l/m

Max Pressure:
- Iron Core E: 650 mbar (9.43 PSI)
- Iron Core: 300 mbar (4.35 PSI)
- Coreless: 400 mBar (5.8 PSI)

Max Vacuum:
- Iron Core E: -500 mbar (14.8 in. Hg)
- Iron Core: -300 mbar (8.86 in. Hg)
- Coreless: -400 mBar (11.8 in. Hg)

Motor:
- Iron Core E: 12 VDC
- Iron Core: 12 & 24 VDC
- Coreless: 6 VDC

Life Expectancy Iron Core Motor- 4500 hours, subject to operating environment

Life Expectancy Coreless Motor- 12000 hours, subject to operating environment

Housing Material: PPS (Polyphenylene Sulphide)

Diaphragm Material: EPDM

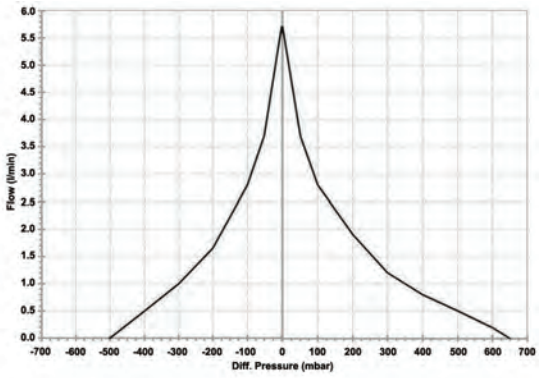
Valve Material: Silicone

Tubing Connection: 4.6 mm

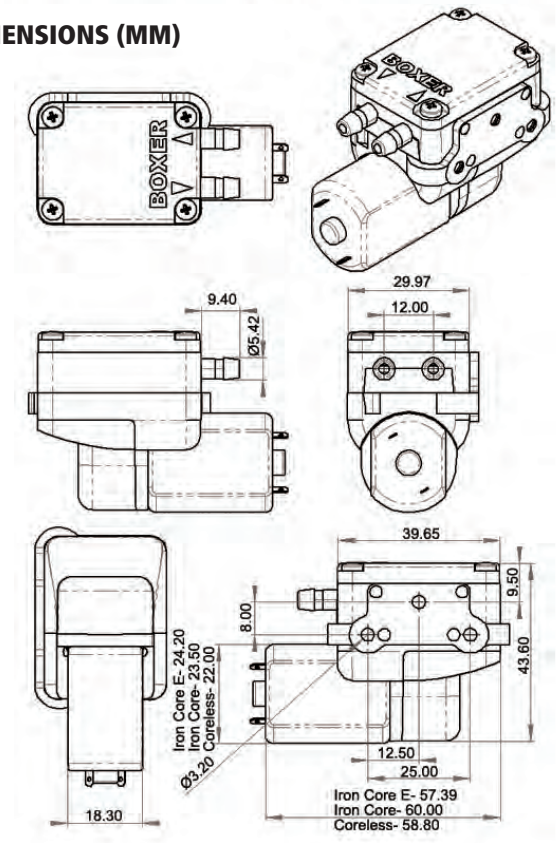
Weight; 80g/85g/100g (Iron Core E/Iron Core/Coreless)

Mounting- Mounting clip supplied

FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
5211.901	Iron Core-E	12	12
5311.901	Iron Core	12	12
5311.902	Iron Core	24	24
5101.906	Coreless	6	6

BOXER
10KD Series Diaphragm Pump
Gas Flow Rate to 6 l/m

DESCRIPTION
The 10KD series double headed gas diaphragm pumps are compact and versatile. High performance engineering plastics and elastomers allow use in high temperature applications. Two heads allow flexibility of par-alllel or series connection to extend the pressure/vacuum capability or to pump two totally separate gasses.

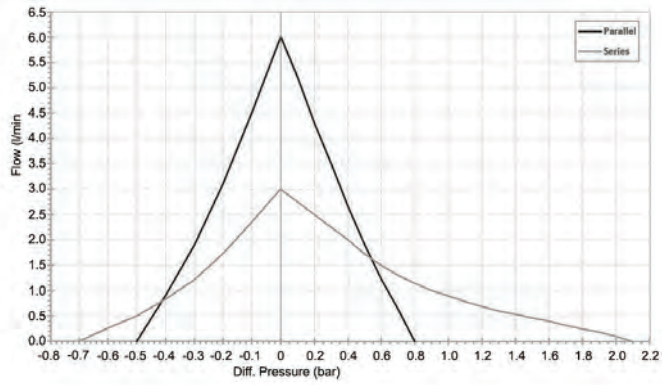
This series is offered with brushed or BLDC motors.

SPECIFICATIONS

GENERAL

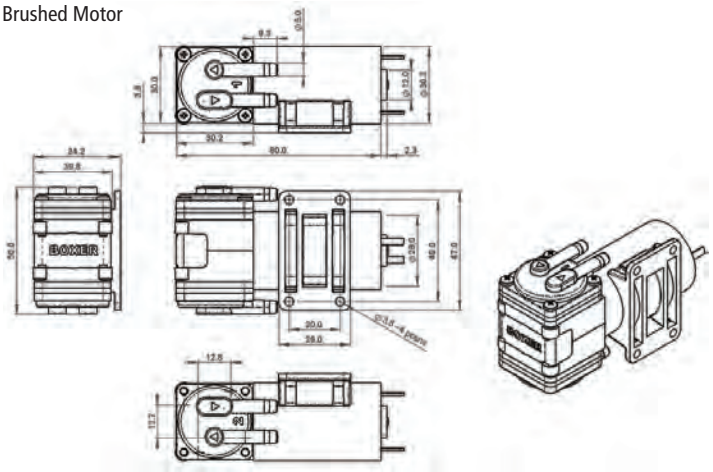
Free Flow: Parallel, 6 l/m; Series, 3 l/m
Max Pressure: Parallel, 0.8 bar (7.25 PSI), Series, 2.1 bar (10.2 PSI)
Max Vacuum: Parallel, -500 mbar (8.86 in. Hg); Series, -700 mbar (16.2 in Hg)
Motor:
  Brushed Motor- 12 & 24 VDC
  Brushless Motor- 24 VDC
Max. Operating Temperature: 50°C
Max Media Temperature: 100°C
Housing Material: PPS (Polyphenylene Sulfide)
Diaphragm Material: Nitrile
Valve Material: Silicone
Tubing Barb Size: 5 mm OD
Mounting Bracket: Included

FLOW CURVE

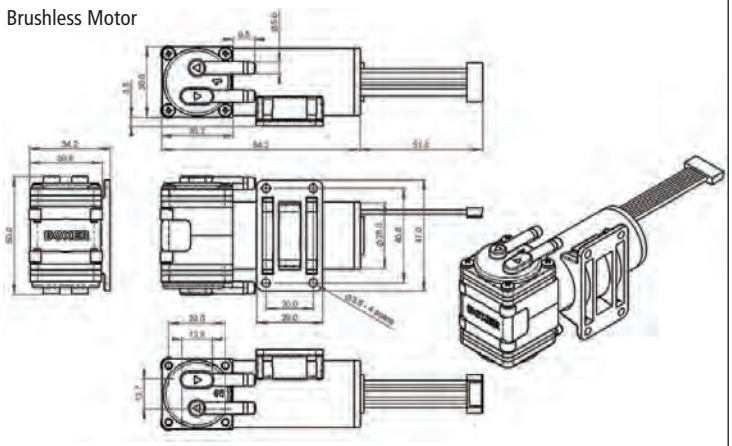


DIMENSIONS (MM)

Brushed Motor



Brushless Motor



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
10102.001	Brushed Motor	12	12
10102.002	Brushed Motor	24	24
10102.601	Brushless Motor	24	24
6900.005	Driver Board for Brushless motors		

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BOXER
3K Series Diaphragm Pump
Gas Flow Rate to 8.2 l/m

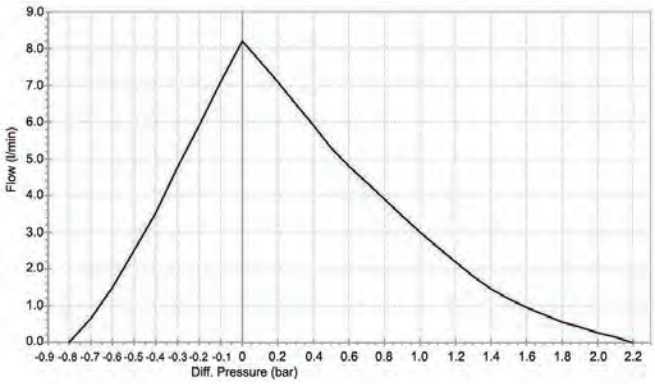
DESCRIPTION
The 3K series is an extremely compact, robust and versatile single headed gas diaphragm pump. High quality connection rod and motor bearings combined with slow speed contribute to maximum operational life. The pumps feature a detachable motor.

This 3K series is offered with 2 different brushed motors.

SPECIFICATIONS

GENERAL
Free Flow: 8.2 l/m
Max Pressure: 2.0 bar (29 PSI)
Max Vacuum: -800 mbar (23.5 in. Hg)
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: Suitable for 6MM ID tubing
Weight: 377g

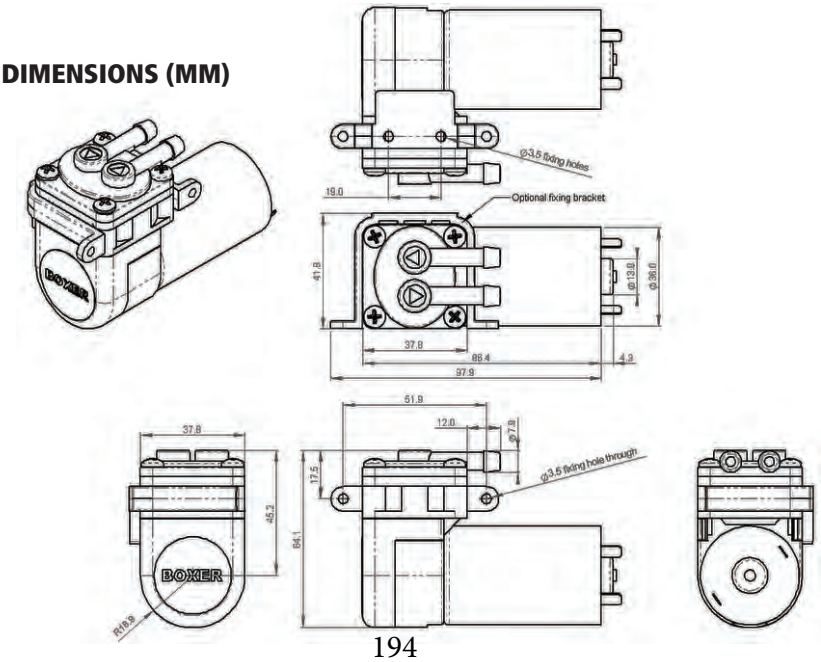
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3111.509	Brushed- Economic	12	12
3111.510	Brushed- Economic	24	12
3111.129	Brushed	12	24
3111.252	Brushed	24	6

DIMENSIONS (MM)



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BOXER
5KD Series Diaphragm Pump
Gas Flow Rate to 10 l/m

DESCRIPTION
The 5KD series double headed diaphragm pumps have a unique design and high performance to size ratio. They have integrated pulsation chambers that substantially reduces pulsation.

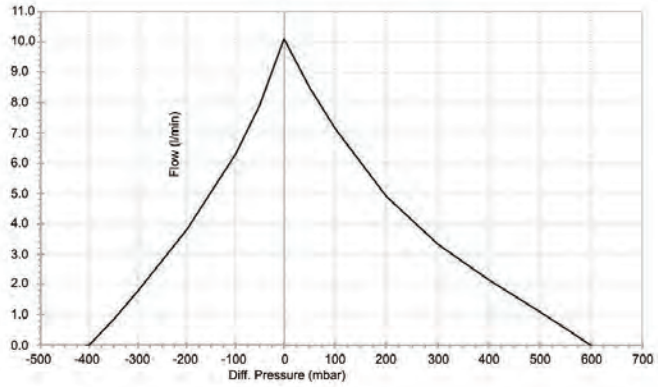
Iron core and coreless DC motor options are offered in this series.

Like all other pumps in the Boxer range, this series can be customized to specific OEM requirements.

SPECIFICATIONS

GENERAL
Free Flow: 10.0 l/m
Max Pressure: 600 mbar (8.7 PSI)
Max Vacuum: -400 mbar (11.8 in. Hg)
Brushed Motor: 12, 24 & 6 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 5.5 MM
Weight; 140g

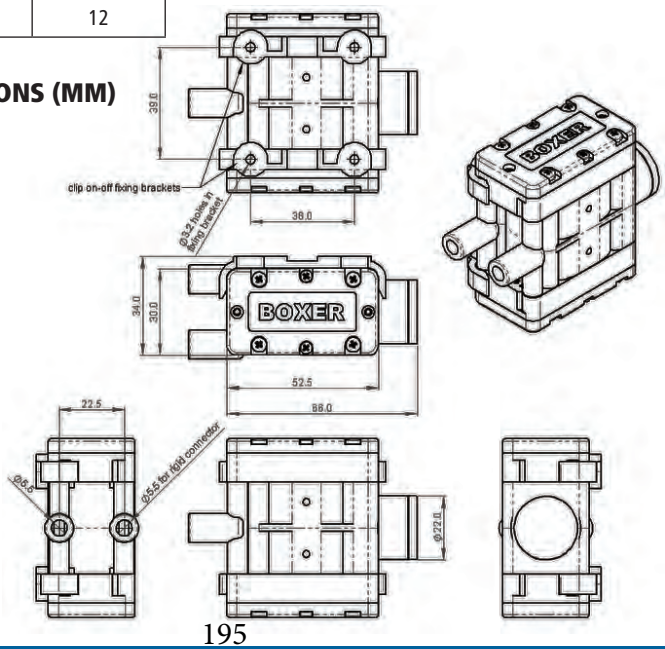
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
5212.002	Iron Core- Economic	12	12
5312.001	Iron Core	12	12
5312.002	Iron Core	24	24
5112.002	Coreless	6	12

DIMENSIONS (MM)



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CLARK

Dia-Vac Gaseous Diaphragm Sampling Pump

Dual Voltage 115-230v AC 50/60 Hz, 12-24v DC, 3.9-12.6 LPM

DESCRIPTION

Dia-Vac® gaseous diaphragm sampling pumps are completely self contained and may be used for either built-in or portable applications. These economical oil-free, contamination-free and leak-free Dia-Vac® pumps may be used for flow and/or pressure/vacuum applications and are CE approved.

SPECIFICATIONS

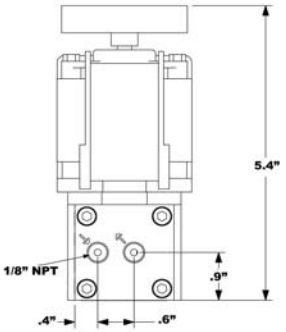
Voltage:
Standard Configuration 115vAC-230vAC , 50/60 Hz
Optional Brush or Brushless 12vDC-24vDC
Pipe Connector: 1/8"-27 NPT
Ambient Temperature: 104°F (40°C)
Up to 400° F (204°C) media temperature with options
Pump Head Materials: Aluminum, Aluminum with Teflon Coating, 316 Stainless Steel, 316 Stainless Steel with Teflon Coating, or All Teflon
Diaphragm Materials: Standard Teflon/EPDM or All Teflon option
Flow: Standard Eccentric size (.16) allows 7.6 LPM but optional eccentrics avaliable for reduced performance
Weight

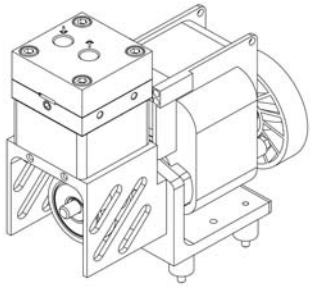
Heated Single Head Dia-Vac® Pump: This self contained head eliminates cold spots in sample systems. These models come complete with a type K thermocouple and two 50 watt cartridge heaters. The pump requires a digital temperature controller to prevent overheating.(See diagram below for measurements)

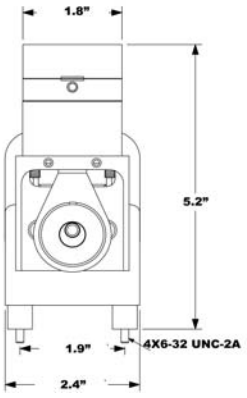
The Double head Dia-Vac is an excellent choice when added flow is required. This pump is also available in elevated and heated head options.

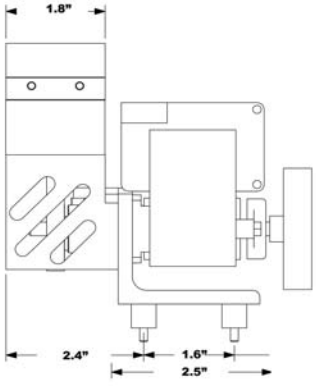
The Elevated Single Head Dia-Vac® Pump is designed for high temperatures allowing the head to be inserted into a heated box with the motor remaining in an ambient.

The Single Head Dia-Vac® May be used for continuous operation and is available in a variety of eccentric sizes to conform to your system requirements.









PERFORMANCE

Flow Averages						
Eccentric Size	**PSIG**	**bar**	**InHg**	**mbar**	**CFM**	**LPM**
.080	8.5	0.59	14.9	505	0.138	3.9
.100	12.9	0.89	17.4	589	0.155	4.4
.120	18.1	1.25	20.2	684	0.20	5.7
.140	23.4	1.61	21.4	725	0.24	6.8
.160 (std.)	29.2	2.01	23.0	778	0.268	7.6
Double (.160)	34.3	2.36	22.2 / 28	752 / 948	.45 / .23	12.6 / 6.43

ORDERING INFORMATION

Ex. B161-FP-AA1 : Single Stage Dia-Vac® w/ SS heads, 0.160 ecc, All-TFE diaphragm, 115v/60Hz

Model	Eccentric Capacity	Number of Heads	Head Material	Diaphragm Material	Type	Voltage	Hz	Options
B	16 (Standard) 14 12 10 08	1 2	A=Alum B=Alum TefCo F=316ss G=316ss TefCo T=Solid Teflon	E=Tef/EPDM P=All Teflon	A=Gen. Pur. H=Brushless DC J=Brush DC	A=115 B=230 H=12 J=24	0=N/A 1=60 1Ph 2=50 1Ph 5=50/60 1Ph	L=Elevated Head M=Heated-K Thermocouple Z=Rotate Housing 180o

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BOXER
3KD Series Diaphragm Pump
Gas Flow Rate to 16 l/m

DESCRIPTION
The 3KD series double headed diaphragm pumps have a unique design and high performance to size ratio. This series additionally offers a unique detachable motor construction allowing contaminated heads to be ecconomically exchanged.

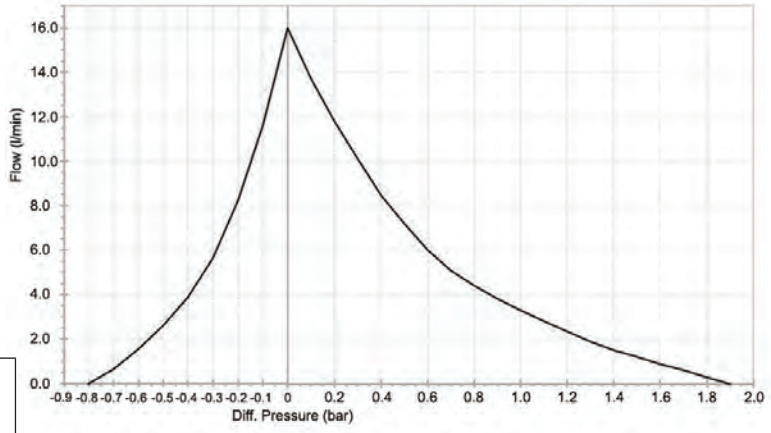
Brushed DC motor options are offered in this series.

Like all other pumps in the Boxer range, this series can be customized to specific OEM requirements.

SPECIFICATIONS

GENERAL
Free Flow: 16.0 l/m
Max Pressure: 1.9 bar (27.6 PSI)
Max Vacuum: -800 mbar (23.6 in. Hg)
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 7.8MM
Weight; 433g

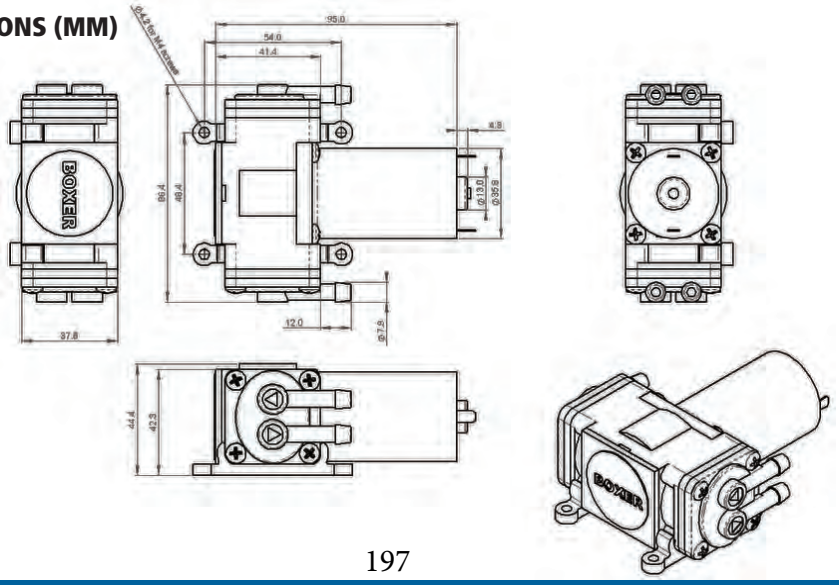
FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3112.509	Brushed- Economical	12	12
3112.510	Brushed- Economical	24	24
3112.129	Brushed	12	24
3112.254	Brushed	24	24

DIMENSIONS (MM)



BOXER
3KQ Series Diaphragm Pump
Gas Flow Rate to 28 l/m

DESCRIPTION
The 3KQ series quad headed diaphragm pumps have a unique design and high performance to size ratio. This series additionally offers a unique detachable motor construction allowing contaminated heads to be ecconomically exchanged.

Brushed DC motor options are offered in this series.

Like all other pumps in the Boxer range, this series can be customized to specific OEM requirements.

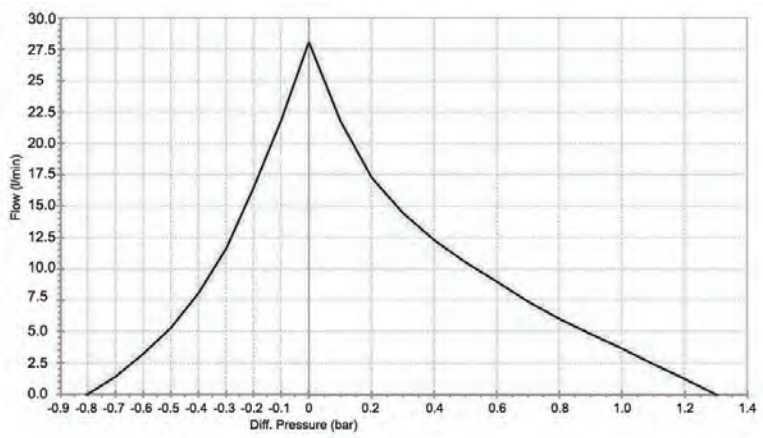
SPECIFICATIONS

GENERAL
Free Flow: 28.0 l/m
Max Pressure: 1.3 bar (18.9 PSI)
Max Vacuum: -800 mbar (23.6 in. Hg)
Max. Ambient Temp: 50°C
Max Media Temp.: 100°C
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: EPDM
Valve Material: Silicone
Tubing Connection: 7.9 MM

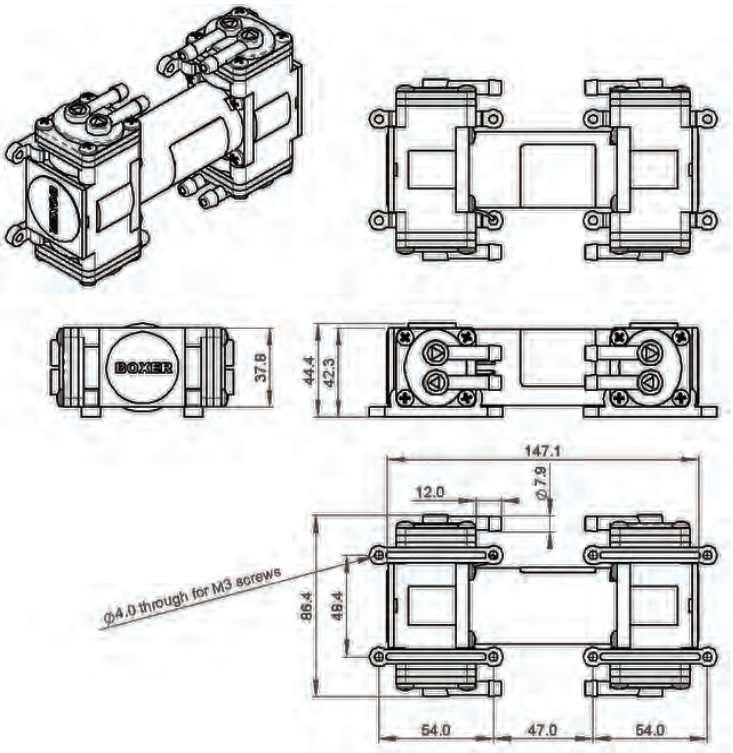
ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3114.129	Brushed	12	12
3114.252	Brushed	24	24

FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



DIMENSIONS (MM)



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BOXER

7KD Series Diaphragm Pump

Gas Flow Rate to 32 l/m

DESCRIPTION

The 7KD series double pump head diaphragm pumps are particularly well suited for gas/dust monitoring as well as industrial vacuum applications. The pump is fitted with internal damping chambers and the dual head arrangement further balances flow.

The use of high performance plastics facilitates use in high temperature applications such as combusion gas analysis. The overall construction is extremely robust.

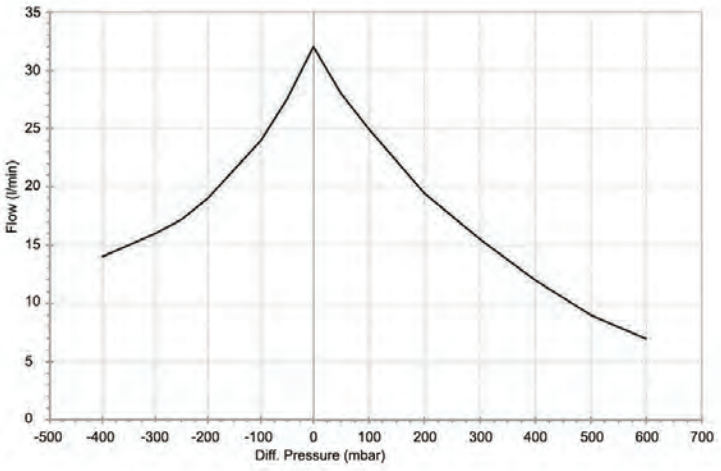
Vibration mounts are fitted as standard.

SPECIFICATIONS

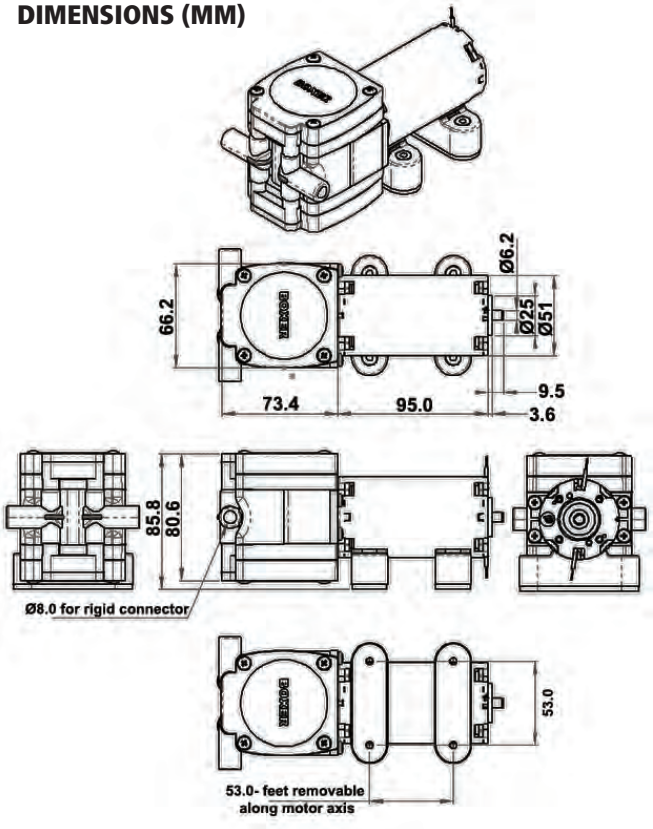
GENERAL

Free Flow: 32 l/m
Configuration: Pumps connected in parallel
Max Pressure: 600 mbar (8.7 PSI)
Max Vacuum: -400 mbar (11.8 in. Hg)
Max. Ambient Temp: 50°C
Max Media Temp.: 100°C
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: Nitrile
Valve Material: Nitrile
Tubing Connection: Barb for 6mm to 8 mm ID tube
Weight: 1100g

FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
7502.012	Brushed	12	12
7502.024	Brushed	24	24

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BOXER
7KQ Series Diaphragm Pump
Gas Flow Rate to 62 l/m

DESCRIPTION
The 7KQ series Quad pump head diaphragm pumps are particularly well suited for gas/dust monitoring as well as industrial vacuum applications. The pump is fitted with internal damping chambers and the Quad head arrangement further balances flow.

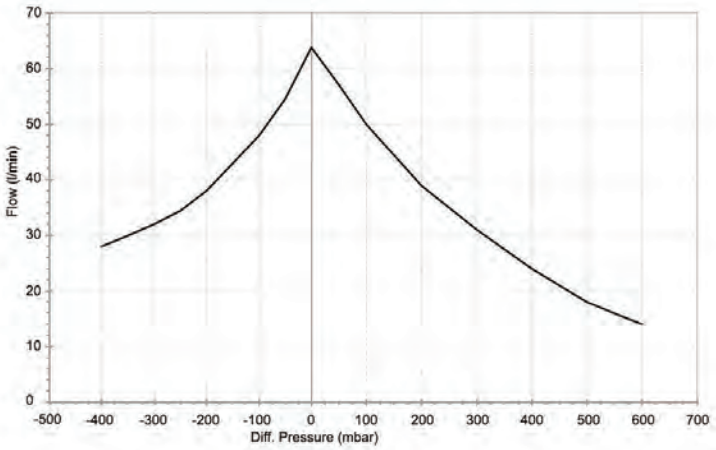
The use of high performance plastics facilitates use in high temperature applications such as combusion gas analysis. The overall construction is extremely robust.

Vibration mounts are fitted as standard.

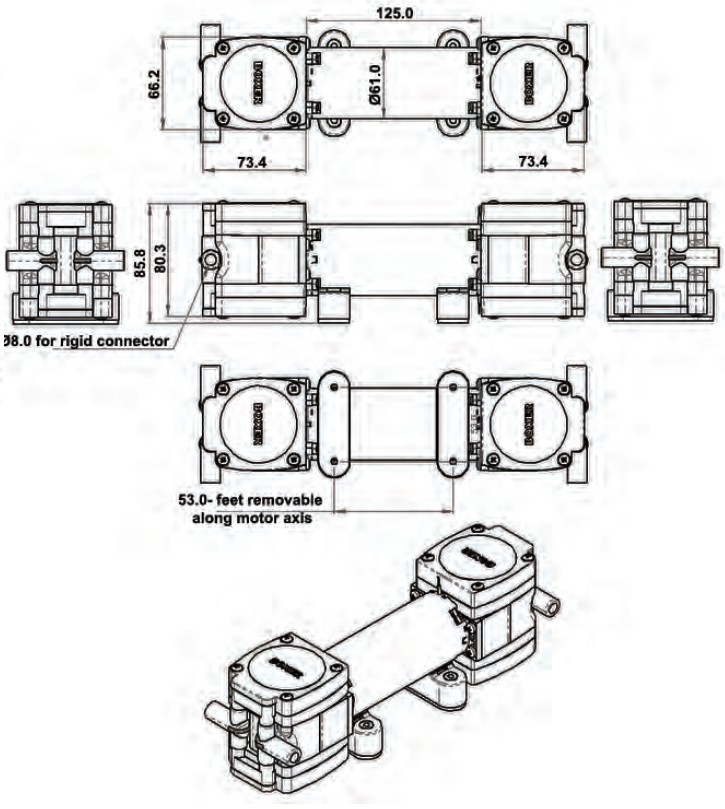
SPECIFICATIONS

GENERAL
Free Flow: 62 l/m
Pump Head Configurations:
Parallel: Connected in parallel (2 inlets/2 outlets)
Also in parallel (1 inlet/1 outlet)
Series: Connected in series (1 inlet/1 outlet)
Max Pressure: 600 mbar (8.7 PSI)
Max Vacuum: -400 mbar (11.8 in. Hg); -850 mbar in series
Max. Ambient Temp: 50°C
Max Media Temp.: 100°C
Brushed Motor: 12 & 24 VDC
Housing Material: PPS (Polyphenylene Sulphide)
Diaphragm Material: Nitrile
Valve Material: Nitrile
Tubing Connection: Barb for 6mm to 8 mm ID tube
Weight: 1870g

FLOW PERFORMANCE (PARALLEL CONFIG./NOM. VOLTAGE)



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)	Pump Head Configuration
7004.012	Brushed	12	9	Parallel (2 inlets/2 outlets)
7004.013	Brushed	12	9	Parallel (1 inlet/1 outlet
7004.014	Brushed	12	9	Series
7004.024	Brushed	24	21	Parallel (2 inlets/2 outlets)
7004.026	Brushed	24	21	Parallel (1 inlet/1 outlet

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CLARK

Pressure/Vacuum Pump Models 133/147/153/163

DC Powered Rotary Vane Pumps

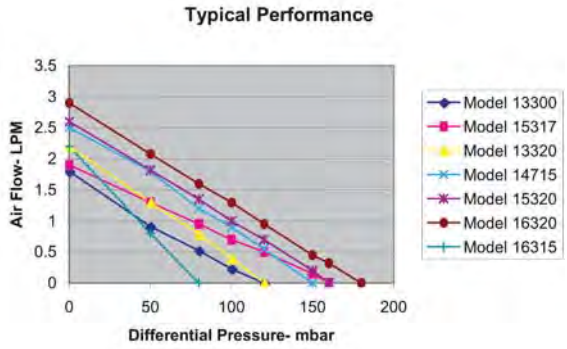
DESCRIPTION

These rotary vane pumps are an excellent pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications. They are also useful for material handling and many general automation applications.

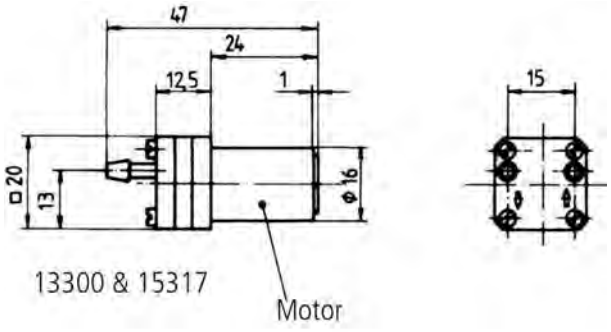
The pumps are quiet, reliable and mount in any position. The units operate oil free. The pump vanes have a service life of 1,000 hours and are easily field replaced without special tools.

SPECIFICATIONS

MaximumDifferential Pressure- 180 mbar
MaximumFlow- 2.9 LPM
Vane Material- Carbon
Media- Inert gases



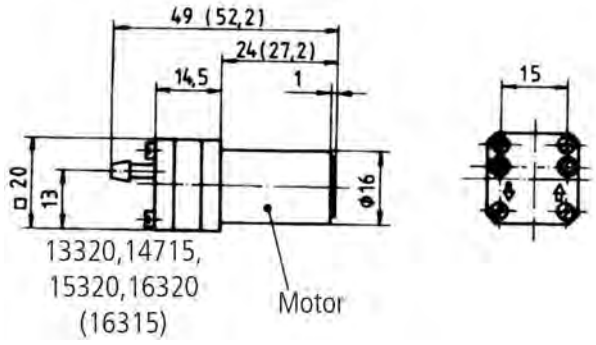
DIMENSIONS (MM)



NOTE

Operation at a somewhat lower than pump design voltage will yield a significantly longer life of the motor and the pump while also decreasing the current draw and operating noise of the unit.

If used for continuous operation, please note that the electrical current will be at least 10% below the specified design current draw. Consequently, we recommend that you select a pump that has a slightly higher pumping capacity than needed during normal operation.



ORDERING INFORMATION

Model	Voltage	Max. Flow(L/min)	Max. Pressure (mbar)	Min Current (mA)	Max. Current (mA)	Weight (grams)
13300	6	1.5	120	150	530	38
15317	12	1.9	160	140	200	38
16320	24	2.9	180	130	180	41
13320	6	2.2	120	180	290	41
14715	9	2.5	150	180	280	41
15320	12	2.6	160	180	270	41
16315	24	2.2	80	80	100	47

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CLARK
Pressure/Vacuum Pump Models 118/126/135/137/138/147/155/157/167/168

DESCRIPTION

These rotary vane pumps are an excellent pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications. They are also useful for material handling and many general automation applications.

The pumps are quiet, reliable and mount in any position. The units operate oil free. The pump vanes have a service life of 1,000 hours and are easily field replaced without special tools.

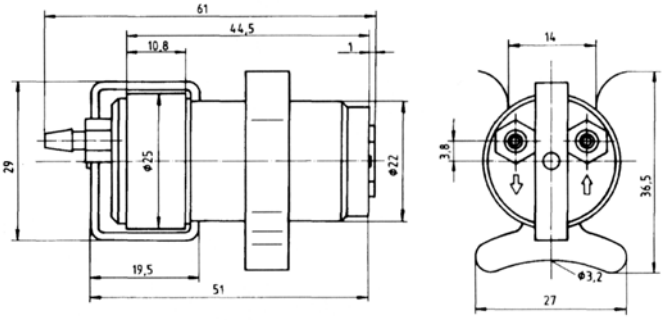
SPECIFICATIONS

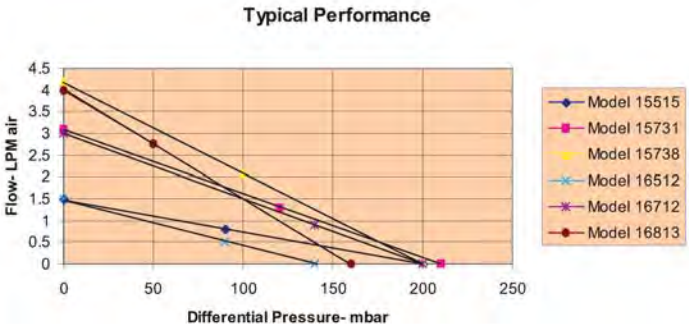
MaximumDifferential pressure- 270 mbar
MaximumFlow-4.3 LPM
Vane Material- Carbon
Media- inert gases

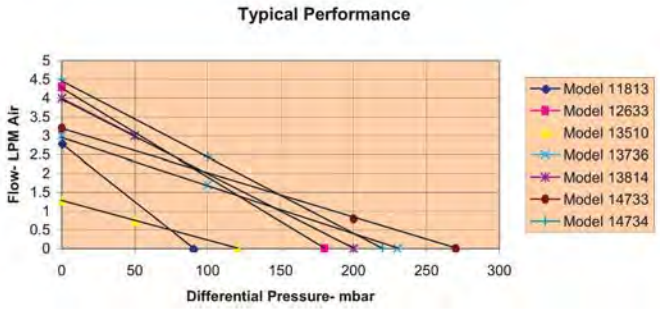
NOTE

Operation at a somewhat lower than pump design voltage will yield a significantly longer life of the motor and the pump while also decreasing the current draw and operating noise of the unit.

DIMENSIONS (MM)







ORDERING INFORMATION

Model	Voltage	Max. Flow(L/min)	Max. Pressure (mbar)	Min Current (mA)	Max. Current (mA)	Weight (grams)
13814	6	4.0	200	270	480	102
15738	12	4.2	200	150	280	102
16813	24	4.0	160	80	120	102
11813	3	2.8	90	230	370	102
12633	4.5	4.3	180	420	730	102
13510	6	1.3	120	140	220	102
13736	6	3.0	230	210	440	102
14733	9	3.2	270	190	390	102
14734	9	4.5	220	270	470	102
15515	12	1.5	200	90	160	102
15731	12	3.1	210	120	230	102
16512	24	1.5	140	40	65	102
16712	24	3.0	200	60	110	102

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CLARK

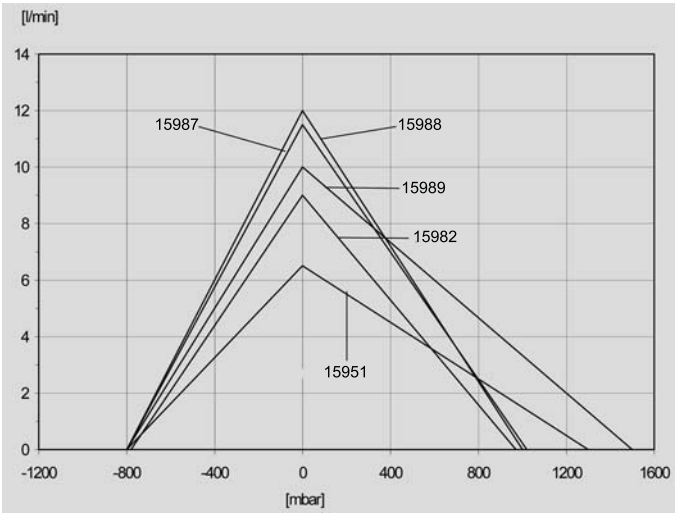
Pressure/Vacuum Pump Model Series 15000

12VDC Powered Rotary Vane Pumps. Gas Flow to 12 LPM

DESCRIPTION

These rotary vane pumps are an excellent pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications. They are also useful for material handling and many general automation applications.

The pumps are quiet, reliable and mount in any position. The units operate oil free. The pump vanes have a service life of 1,000 hours and are easily field replaced without special tools.



SPECIFICATIONS

Max Pressure/Max Vacuum- 1500 mbar/800 mbar
Maximum Flow- 12 LPM
Vane Material- Carbon
Media- Inert gases

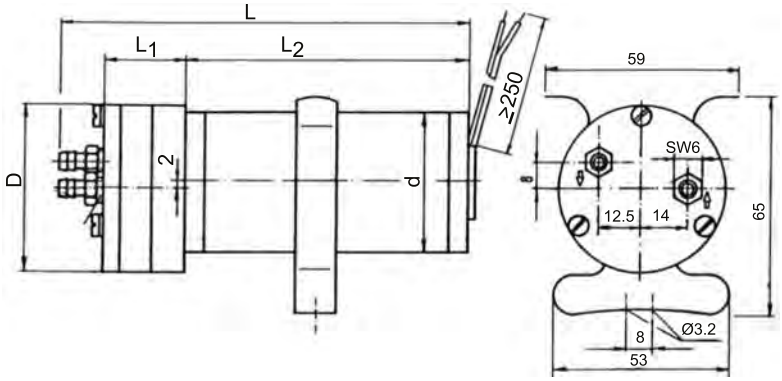
NOTE

Operation at a somewhat lower than pump design voltage will yield a significantly longer life of the motor and the pump while also decreasing the current draw and operating noise of the unit.

If used for continuous operation, we recommend selection of a pump that has a slightly higher pumping capacity than needed during normal operation.

DIMENSIONS (MM)

Model	D	d	L	L_1	L_2
15951	50	42	106	20.5	72
15982	50	42	109	23.5	72
15987	50	42	109	23.5	72
15989	50	42	132	23.5	85
15988	50	42	132	23.5	85



ORDERING INFORMATION

Model	Voltage	Max. Flow(L/min)	Max. Pressure (mbar)	Max Vacuum mbar	Min.Current (A) Min.Flow,No Load	Max. Current (A) Max. Flow, No Load	Max. Current (A) Max. Pressure	Weight kg
15951	12	6.5	1300	800	1.0	1.9	4.0	0.65
	9	5.0	1000	760	0.8	1.8	**3.1**	
	6	3.0	650	630	0.6	1.6	2.1	
15982	12	9.0	970	780	1.3	2.6	4.2	0.67
	9	7.0	710	690	1.0	2.4	3.3	
	6	5.0	560	500	0.8	1.9	2.2	
15987	12	11.5	1020	800	1.7	3.2	4.5	
	9	8.5	725	700	1.4	2.8	3.5	
	6	5.5	450	510	0.9	2.2	2.3	
15989	12	10.0	1500	800	1.4	2.8	6.4	0.78
	9	8.0	1100	780	1.1	2.6	4.9	
	6	5.3	870	650	0.8	2.3	3.1	
15988	12	12.0	1000	800	1.5	3.2	5.0	
	9	9.5	1000	730	1.4	2.9	4.9	
	6	6.5	650	600	0.8	2.5	3.3	

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CLARK

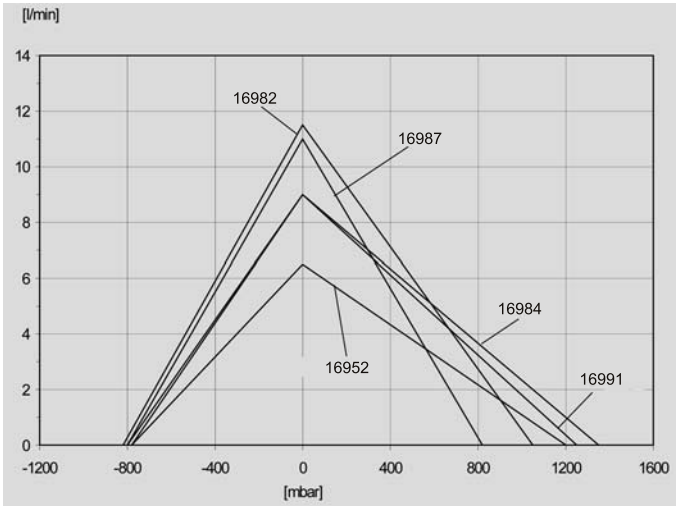
Pressure/Vacuum Pump Model Series 16000

24VDC Powered Rotary Vane Pumps, Gas Flow to 11.5 LPM

DESCRIPTION

These rotary vane pumps are an excellent pressure/vacuum source for gas analyzers, medical devices, process samplers and other analytical instrument applications. They are also useful for material handling and many general automation applications.

The pumps are quiet, reliable and mount in any position. The units operate oil free. The pump vanes have a service life of 1,000 hours and are easily field replaced without special tools.



SPECIFICATIONS

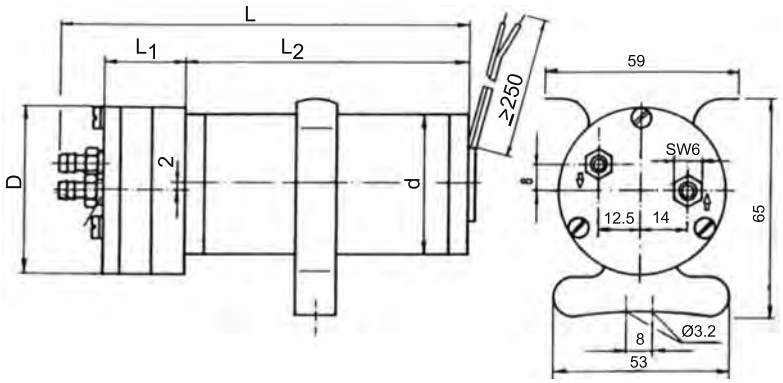
Maximum Differential pressure- 1200 mbar
Maximum Flow- 11.5 LPM
Vane Material- Carbon
Media- inert gases

NOTE

Operation at a somewhat lower than pump design voltage will yield a significantly longer life of the motor and the pump while also decreasing the current draw and operating noise of the unit.

If used for continuous operation, we recommend selection of a pump that has a slightly higher pumping capacity than needed during normal operation.

DIMENSIONS (MM)



Model	D	d	L	L_1	L_2
16952	50	42	106	20.5	72
16984	50	42	109	23.5	72
16982	50	42	109	23.5	72
16991	50	42	132	23.5	85
16987	50	42	132	23.5	85

ORDERING INFORMATION

Model	Voltage	Max. Flow(L/min)	Max. Pressure (mbar)	Max Vacuum mbar	Min.Current (A) Min.Flow,No Load	Max. Current (A) Max. Flow, No Load	Max. Current (A) Max. Pressure	Weight kg
16952	24	6.5	1200	780	0.4	0.9	2.0	0.65
	15	4.0	800	725	0.3	0.7	**1.4**	
	9	2.0	570	500	0.2	0.6	0.7	
16984	24	9.0	1350	780	0.6	1.1	2.2	0.67
	15	5.0	700	600	0.4	0.9	1.1	
	9	2.0	290	290	0.2	0.5	0.5	
16982	24	11.5	1050	820	0.7	1.4	2.3	
	15	6.0	250	600	0.4	1.1	1.2	
	9	2.8	140	270	0.2	0.6	0.7	
16991	24	9.0	1250	800	0.7	1.3	2.7	0.78
	15	4.5	760	550	0.4	0.9	2.7	
	9	2.0	230	280	0.3	0.6	0.6	
16987	24	11	820	800	0.6	1.2	1.3	
	15	5.5	650	600	0.3	1.0	1.4	
	9	3.0	250	250	0.2	0.6	0.6	

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BOXER

Series 8K Vibrating Armature Gas Pump

AC Power, Gases to 2.75 LPM, Vacuum to 140 mb, Pressure to 125 mb

DESCRIPTION

The 8K range of Boxer Pumps has been specifically developed for applications which require high and constant performance over long periods of time.

The Boxer 8K pumps are commonly used in medical equipment, gas analyzers and other instrumentation where reliability under continuous operation is of paramount importance.

The unique compact vertical construction of the pump allows installation in tight spaces.

For OEM projects, special features such as diodes or thermal cut-off devices can be integrated into the coil windings and the pump could be supplied in virtually any voltage specification - subject to quantities.

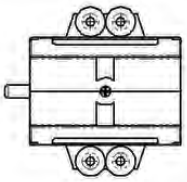
SPECIAL FEATURES

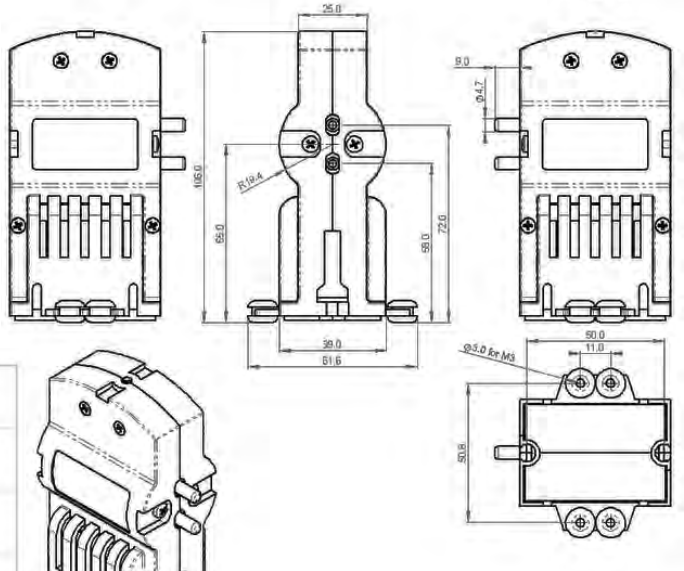
Oil and Maintenance Free Operation
Quiet, Compact and Reliable
Excellent Current/Flow Ratio
Flow Adjustment Screw for Optimum Operation

SPECIFICATIONS

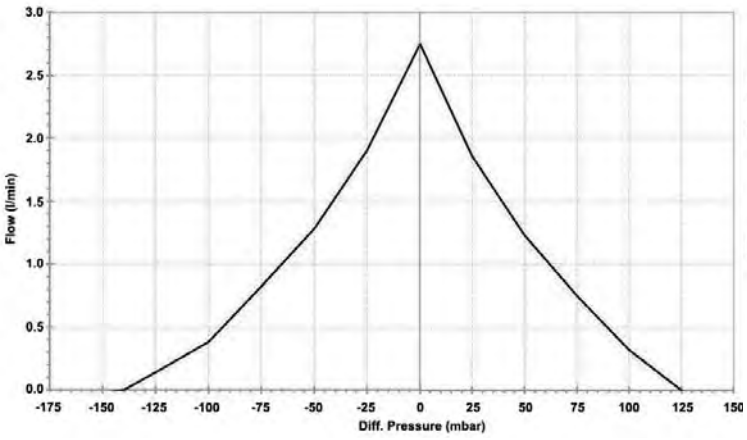
Max Free Flow: 2.75 LPM
Max Vacuum: -140 mb (4.13" Hg)
Max Pressure: 125 mb (3.69" Hg)
Weight: 245g
Housing Material: PPO(Polyphenylene oxide)
Diaphragm: Neoprene
Valves: Silicone
Connection Tubing ID: 3/16"
Typical Life Expectancy: In excess of two years continuous use subject to operating environment
Weight: 245g

DIMENSIONS (MM)





FLOW CURVE



ORDERING INFORMATION

Model	Description
8024.024	24VAC, 50/60Hz
8110.110	110VAC, 50/60Hz
8230.230	230VAC, 50/60Hz

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