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sales@clarksol.com

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LIQUID PUMPS

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PUMPS

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BELLOWS

- 227** Boxer 8K Vibrating Armature Pump, AC Power, to 2.75 LPM

MCP & PKP Series Inert Dispensing Pumps

DESCRIPTION

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 function is like that of an eye dropper. The MCP-50 and the PKP type pumps 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 MCP-50

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

PKP-300
PKP-500

LEADS (RAD WIRE V)
AWG22 UL1430 L300

LABEL

43

22

1.75-28UNF

$\phi 8$

VOLUME ADJUSTMENT SCREW
M4 x 0.5

2-M4 L3

10

25

48

38

2

(45)

A

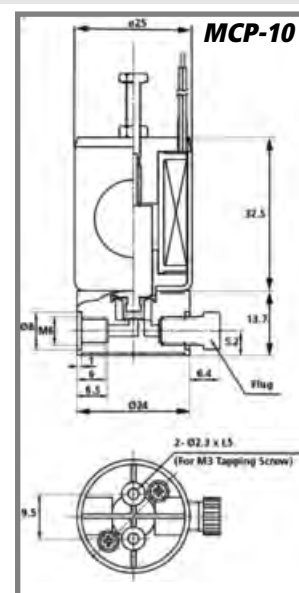
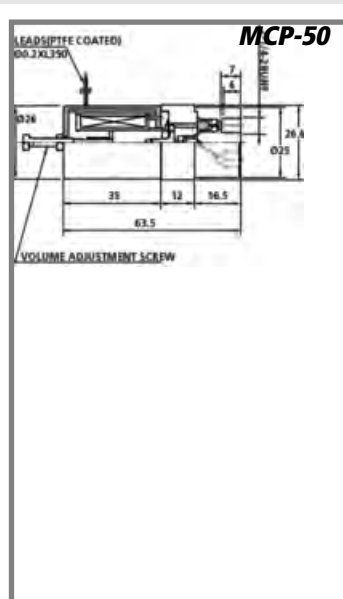
B

Outlet

Inlet

PKP 300 PKP 500

A	38	33
B	83	78



*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

4

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 industries.

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)

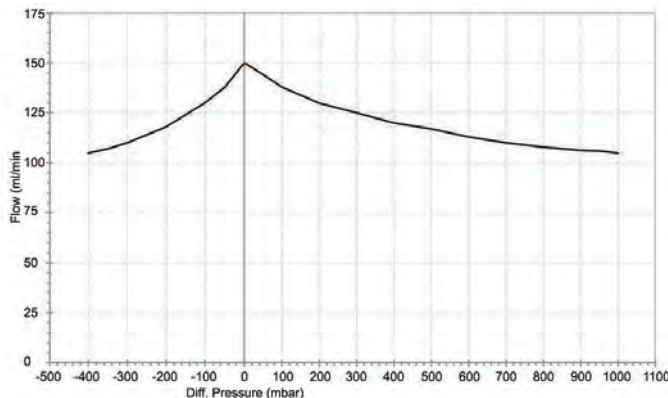
Diaphragm Material: EPDM

Valve Material: EPDM

Tubing Barb Size: 4.7 mm OD

Weight: Iron Core, 60g; Coreless, 65g; Brushless, 63g

FLOW CURVE

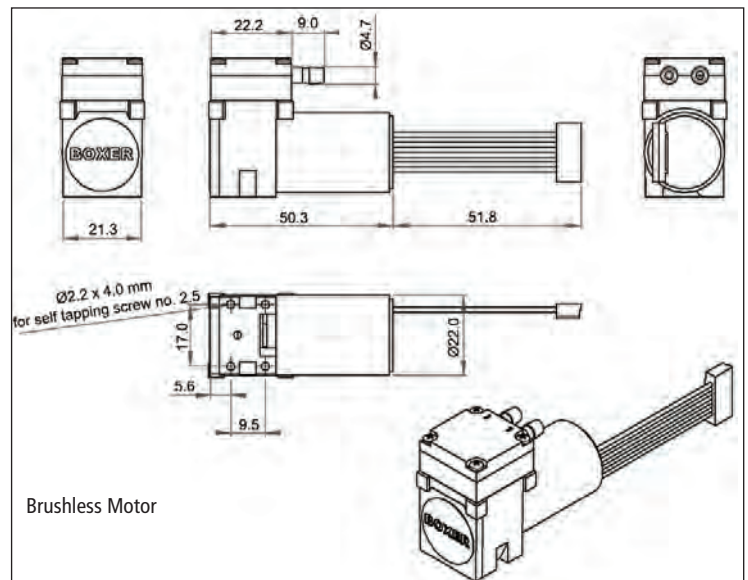
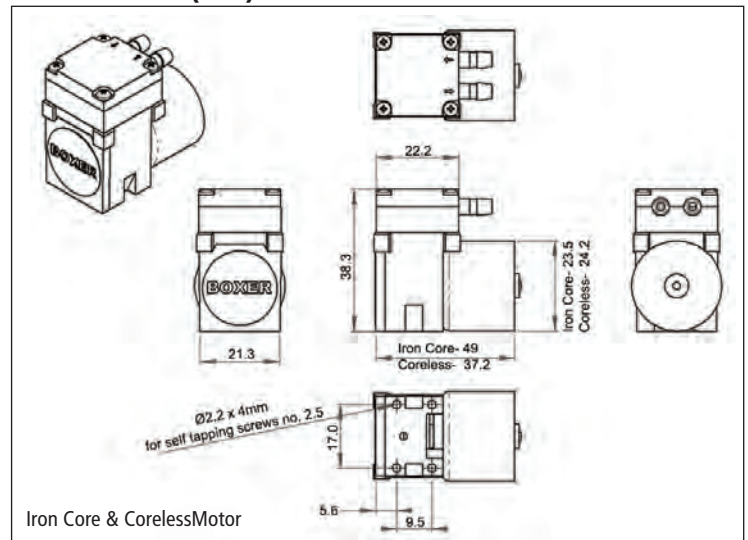


ORDERING INFORMATION

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		



DIMENSIONS (MM)



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.

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 fluoro 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

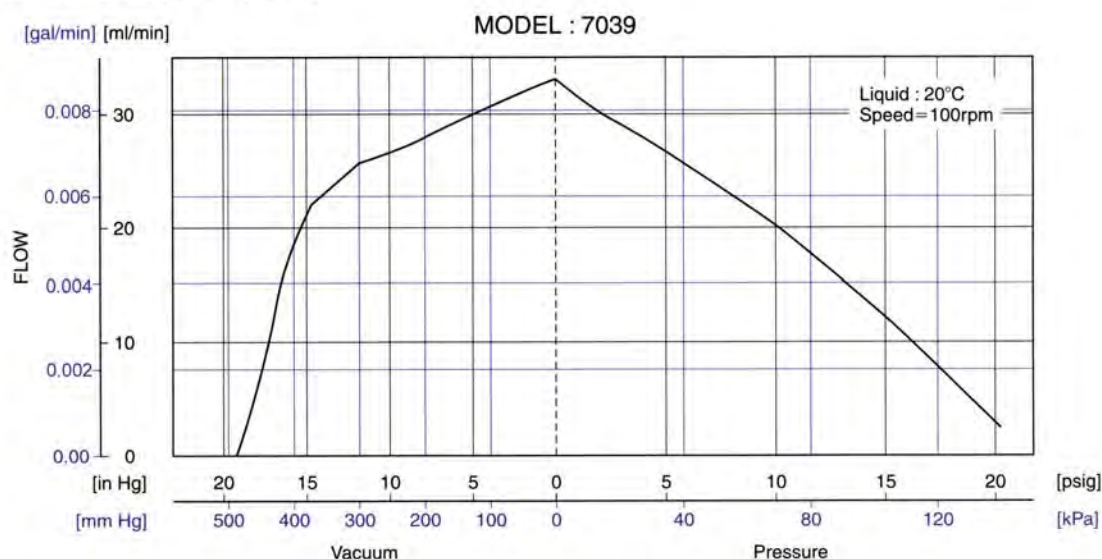
Flow Rate at Nominal Speed: 32 ml/min

Nominal Current Consumption: 0.3 A/phase

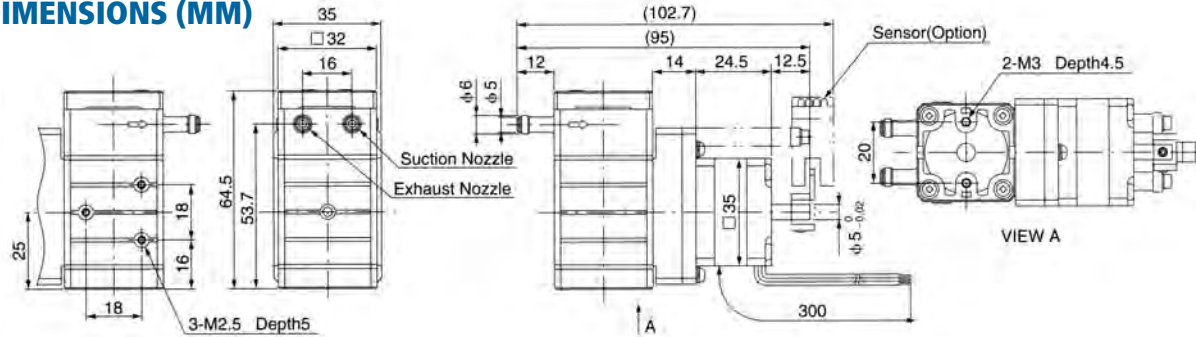
Pull-in Rate: Over 900 (full step) pps

Pull-out Rate: Under 1100 (full step) pps

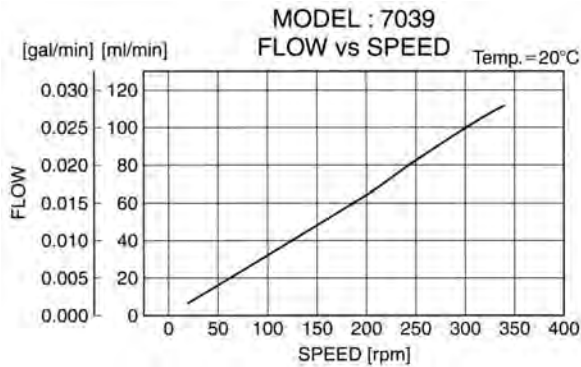
Weight: 280g



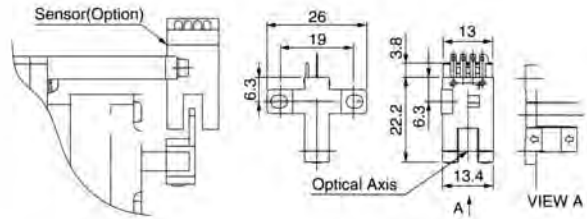
DIMENSIONS (MM)



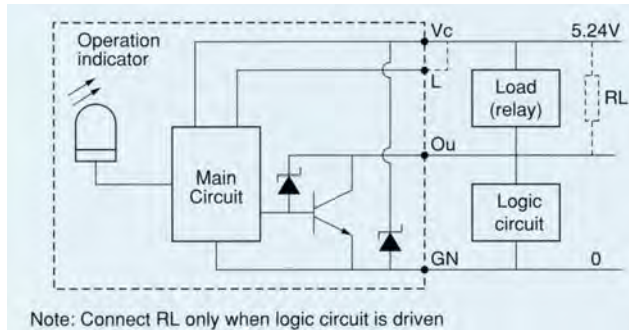
FLOW/SPEED CHARACTERISTICS



Optional Photomicrosensor: Omron, EE-SX672A



PHOTOMICROSENSOR OUTPUT CIRCUIT (NPN)

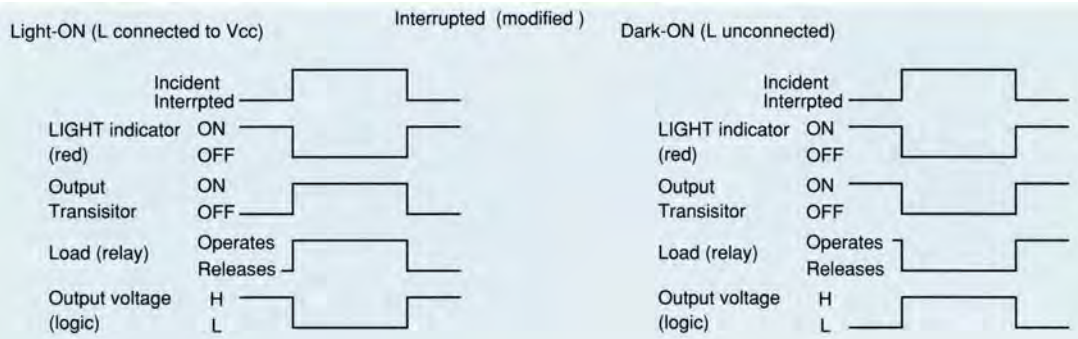


Supply Voltage: 5 to 24 V
Current Consumption: 35 mA
Max Load Current: 100 mA
Max Frequency: 1 kHz
Electrical:

Pin 1- Vcc
Pin 2- L
Pin 3- Output

Note: Connect RL only when logic circuit is driven

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

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.

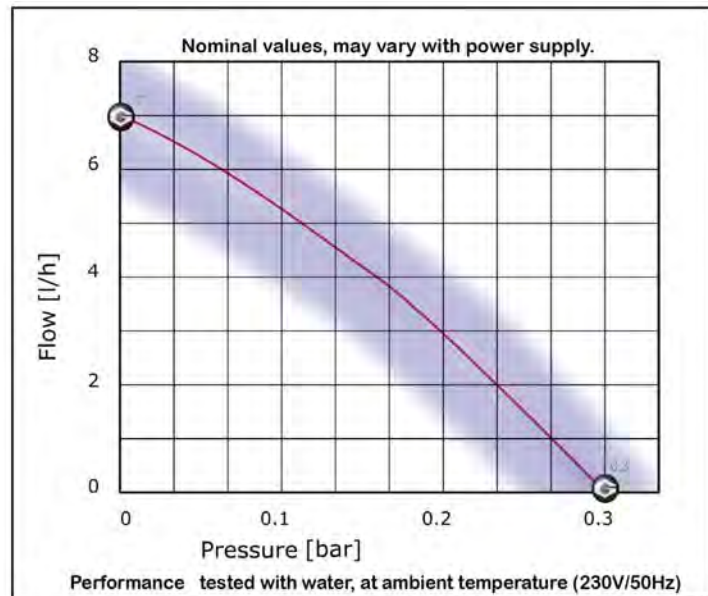
The pump is useful for many fluid transfer applications in equipment for HVAC, Medical, Automated Chemistry, and General Automation Applications.

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 mm²/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

FLOW CURVE



Above items typically ship from stock



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

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

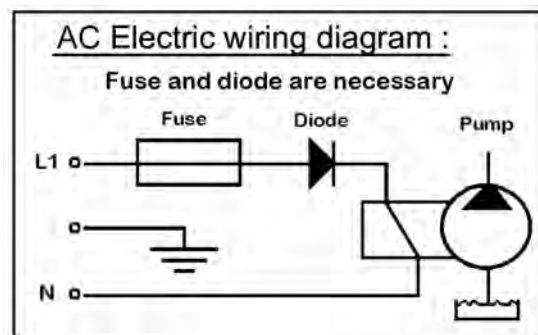
Insulation: Class F-100% ED / 20 [°C] with heat sink (Class H on request), Class I

Piping Connections- 1/4 " O.D. Barb

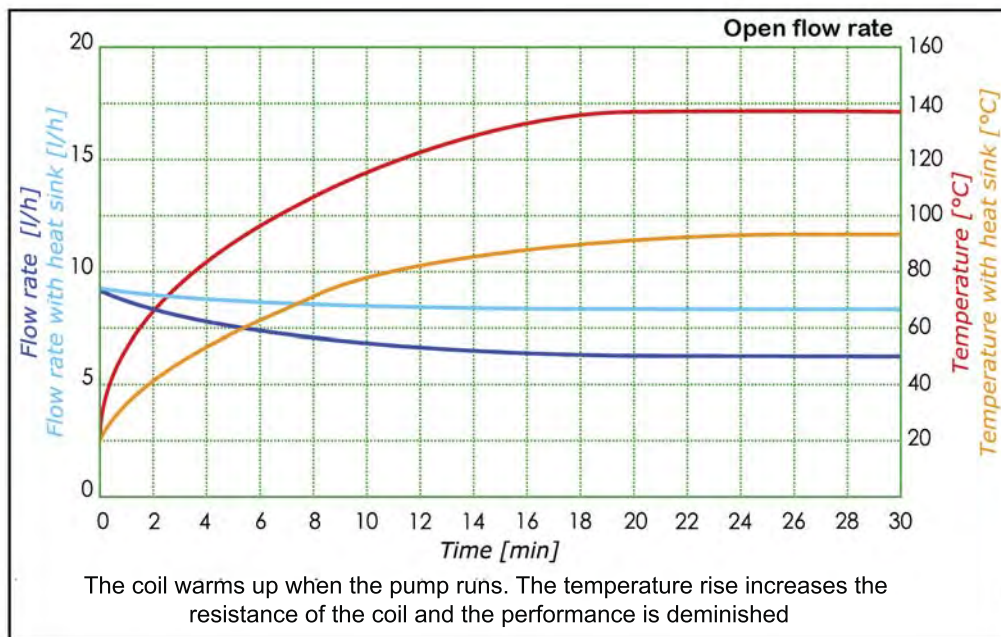
Optional Mounting- Integral Heat Sink w/2ea 1/8" Holes 3/4" on center (see drawing)

Weight- 90 g

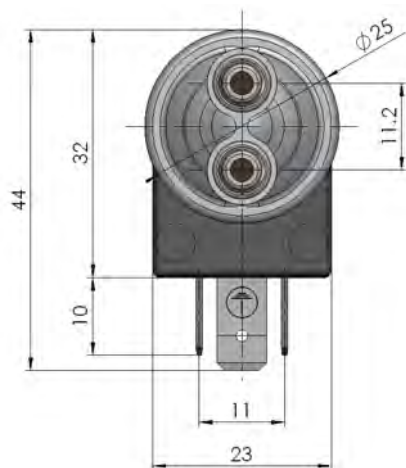
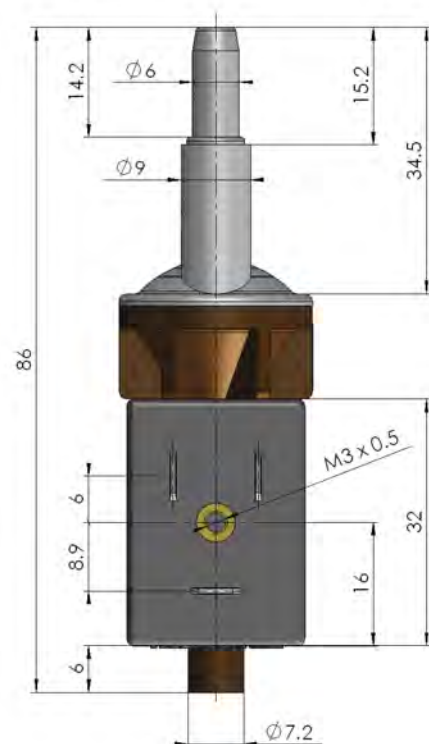
ELECTRICAL



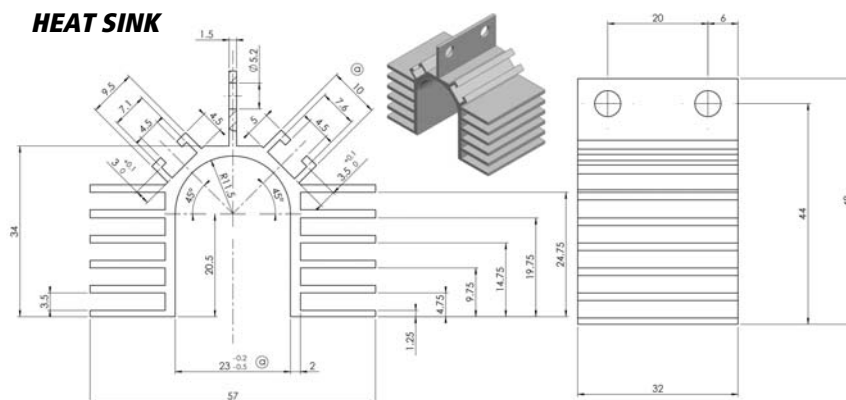
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



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

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 fluoro 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

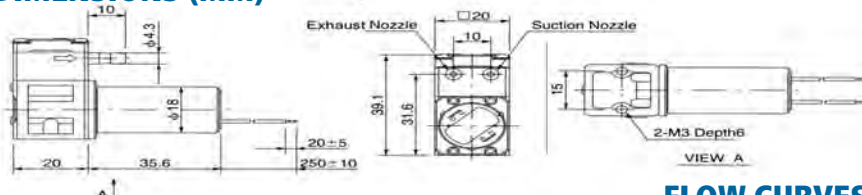
Brush Type: Graphite

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



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 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 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 fluoro 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)

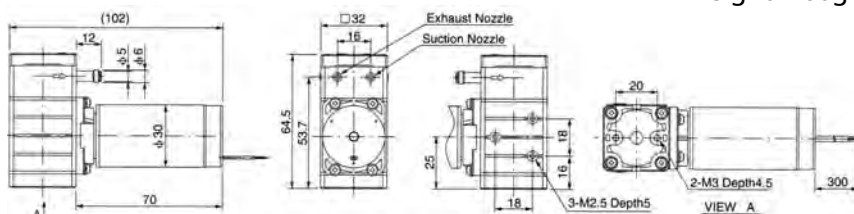
Suction Pressure Range: 0 to -375 mm Hg

Motor: Namiki 24VDC brushless with integrated sensor drive circuit type

Nominal Current Consumption: 370 mA

Weight: 280g

DIMENSIONS (MM)



FLOW CURVES

ORDERING INFORMATION

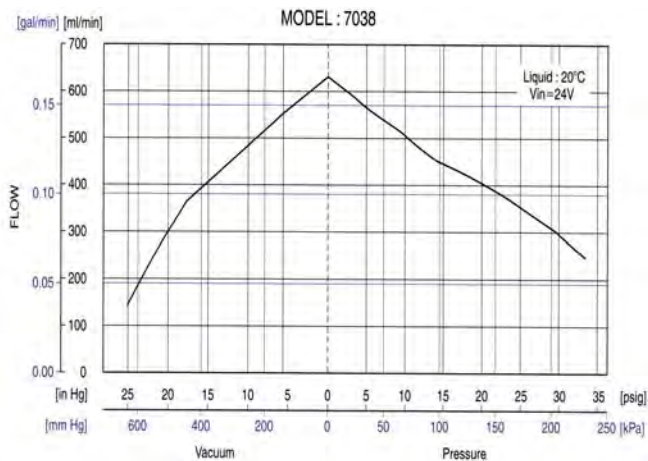
ORDER NUMBER (SEE TABLE)

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.



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)

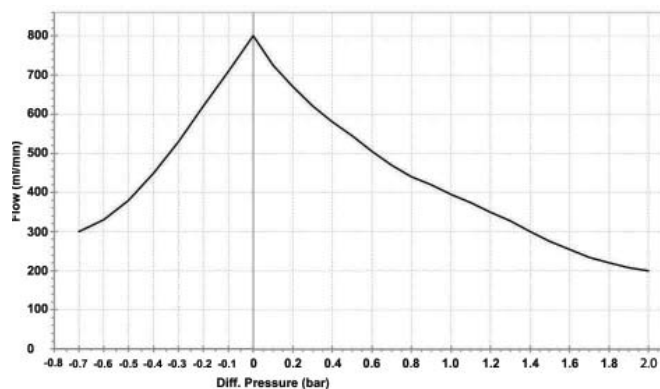
Diaphragm Material: EPDM

Valve Material: EPDM

Tubing Barb Size: 5 mm OD

Weight; 173g

FLOW CURVE

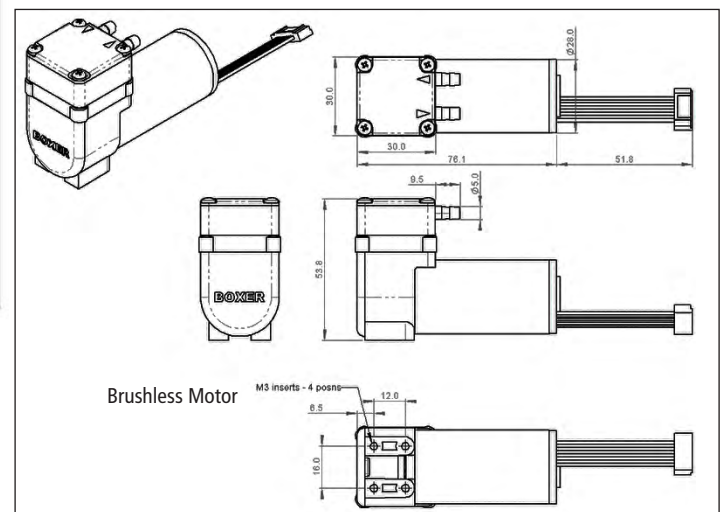
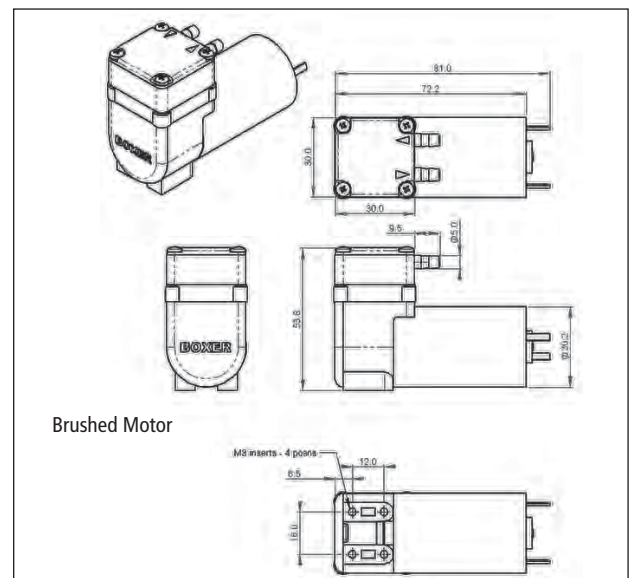


ORDERING INFORMATION

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		



DIMENSIONS (MM)



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.

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)

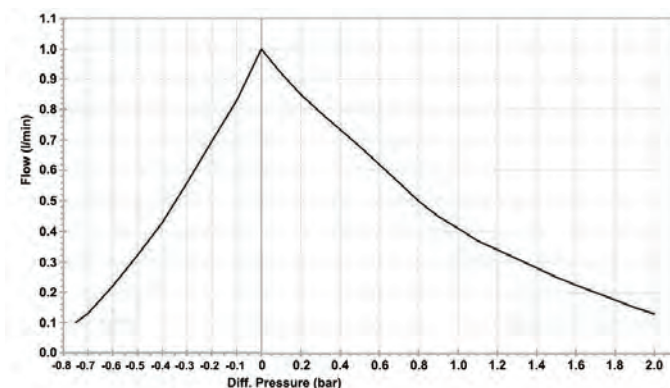
Diaphragm Material: Nitrile

Valve Material: Silicone

Tubing Barb Size: 5 mm OD

Mounting Bracket: Included

FLOW CURVE



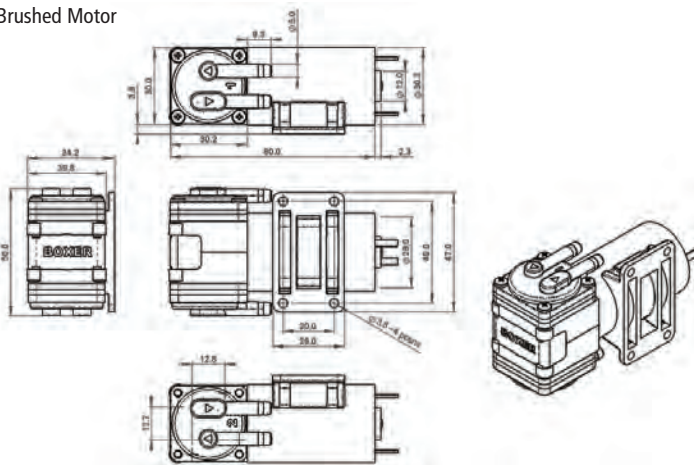
ORDERING INFORMATION

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		

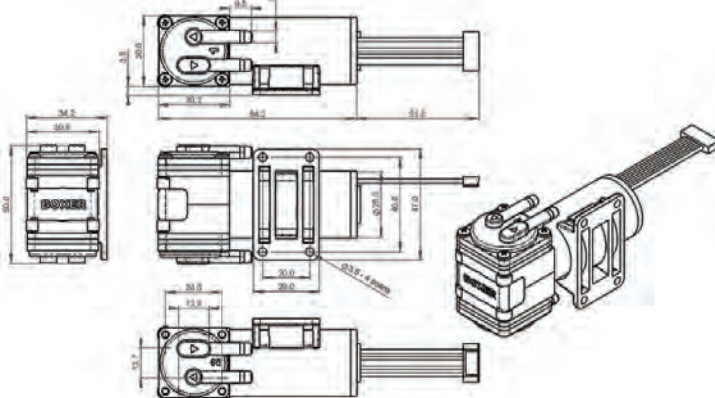


DIMENSIONS (MM)

Brushed Motor



Brushless Motor



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.

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 economically 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

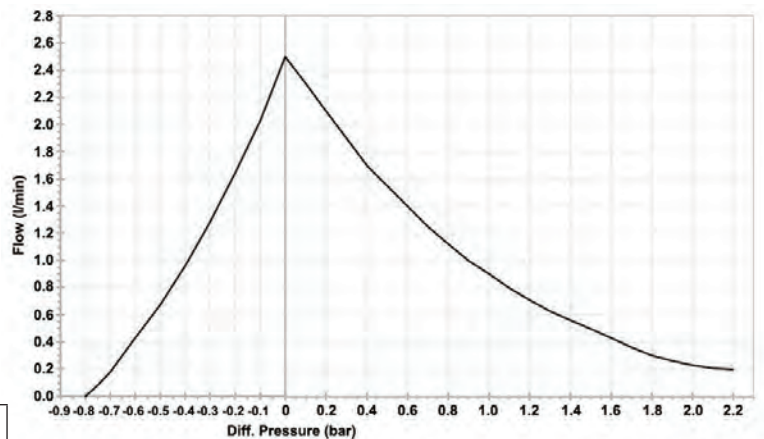
GENERAL

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

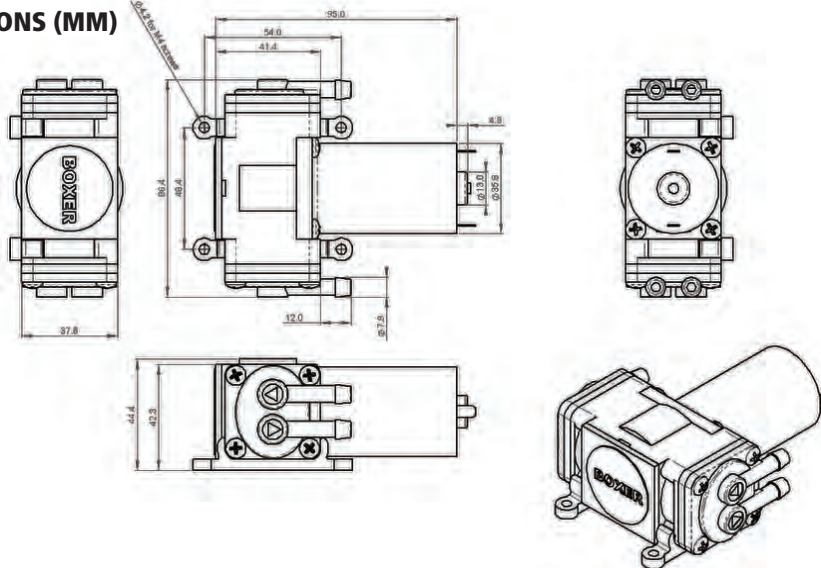
ORDERING INFORMATION

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

FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



DIMENSIONS (MM)



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 economically 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

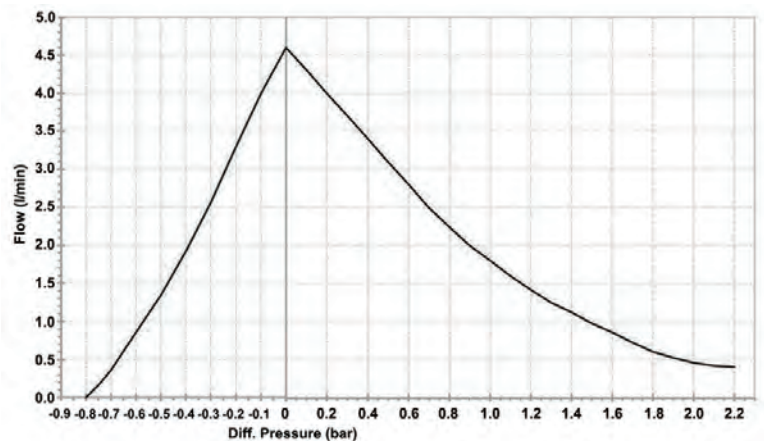
GENERAL

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

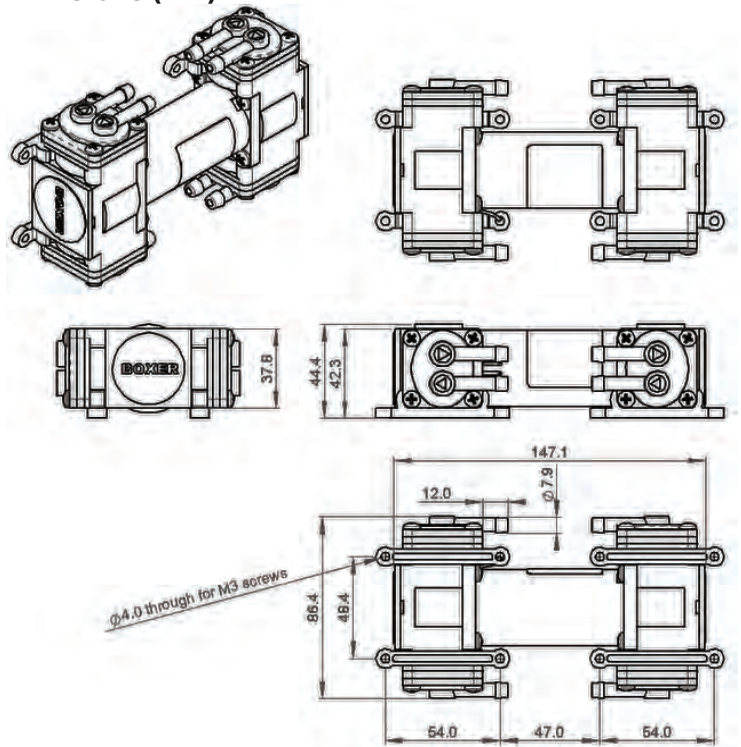
ORDERING INFORMATION

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)



GOTEC

Oscillating Piston Pumps

General Principle Of Operation

DESCRIPTION

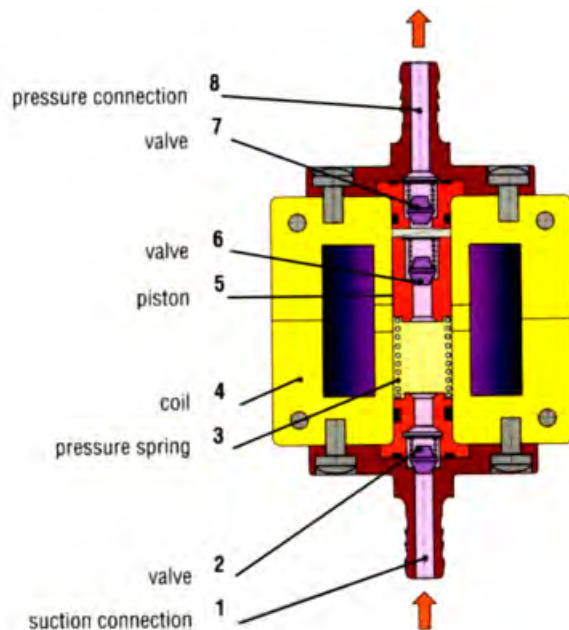
The piston (5) is moved by the electromagnetic field generated by the single wave diode rectified current flowing through the coil (4). Each current pulse moves the piston against the pressure spring (3). This movement, by reducing the volume in the suction chamber, opens the valve (6) set in the piston 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

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.

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 mm²/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

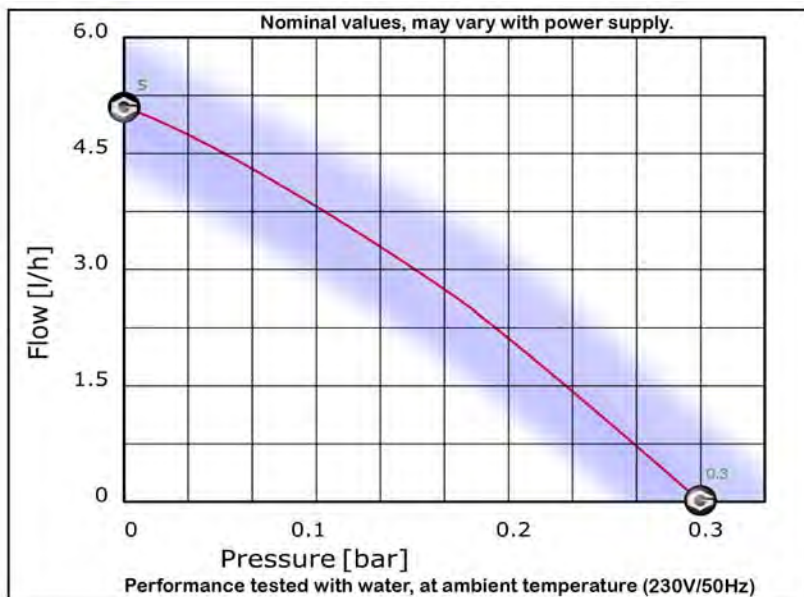
Insulation: Class F-100% ED / 20 [°C], Class 1
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)

Dimensions- See dimension drawing

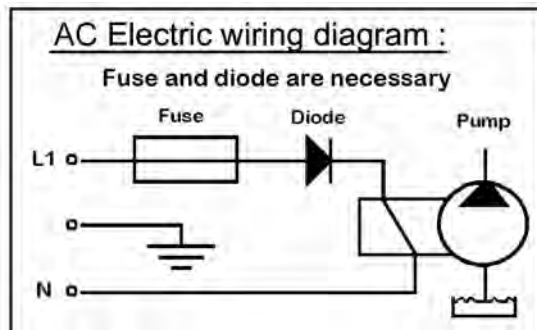
Piping Connections- 7 mm (1/4 " O.D.) hose barb

Weight- 35g

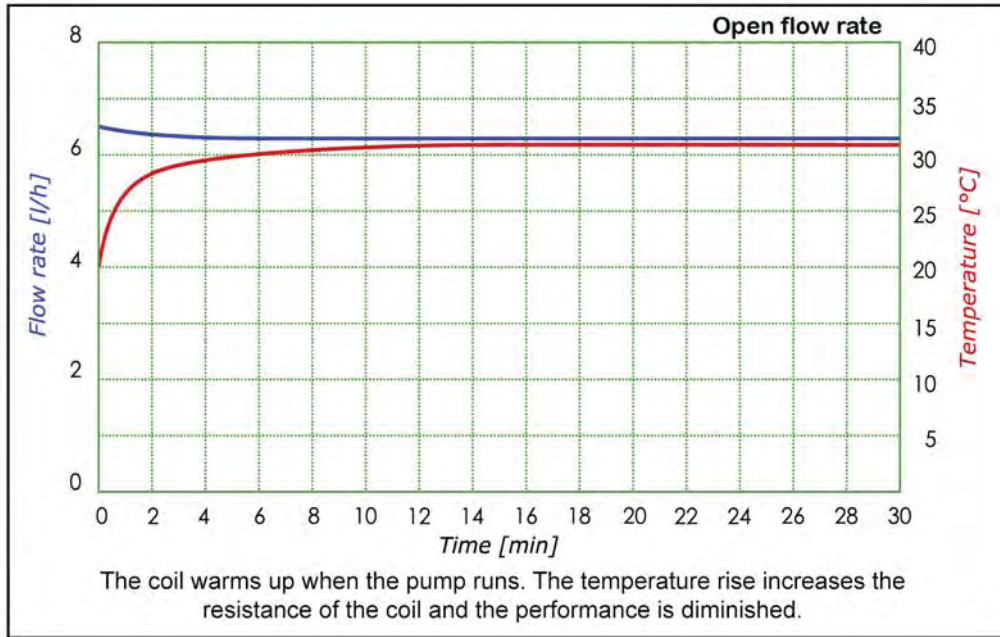
FLOW CURVE



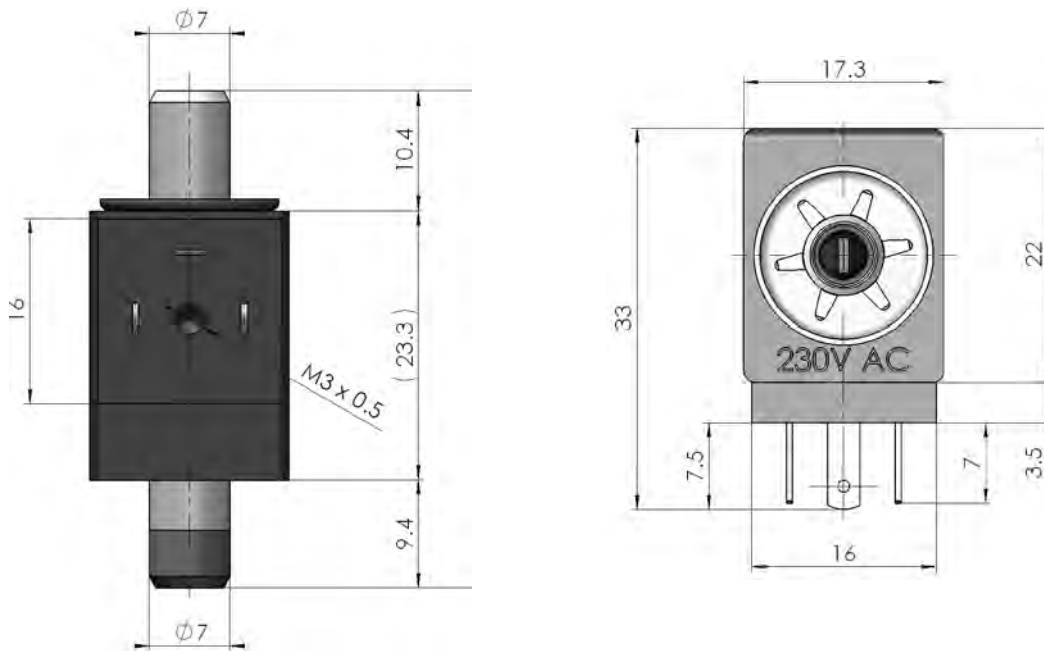
ELECTRICAL



EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



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.

GOTEC

EMX-25 Miniature Piston Pump

Solenoid Operated, Flow to 12 L/H (3.17 GPH)

Pressure to 2.5 Bar (36.3 PSI)

DESCRIPTION

Model EMX-25 oscillating piston pump is 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.

The precision ground machined elements, piston and bushing, guarantee minimum wear and exceptional component life. With only stainless steel connectors, piston and spring and PTFE or PPS valve tips 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, 50/60 Hz, diode rectified

Wetted Pump Materials- 303, 304, 316, & 431 SS

Connectors: AISI 431 SS (1.4057)

Piston: AISI 431 + Cr (1.4057 + Cr)

Springs: AISI 316 (1.4401)

Valves- PTFE or PPS

Solenoid Housing- Molded epoxy

Maximum Pressure- 2.5 bar (36.3 PSI)

Maximum Flow- Standard Vers., 12 L/H (2.38 GPH)

Viscosity Range- 1....600mm²/s

Particle Tolerance- 100 mesh

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

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)

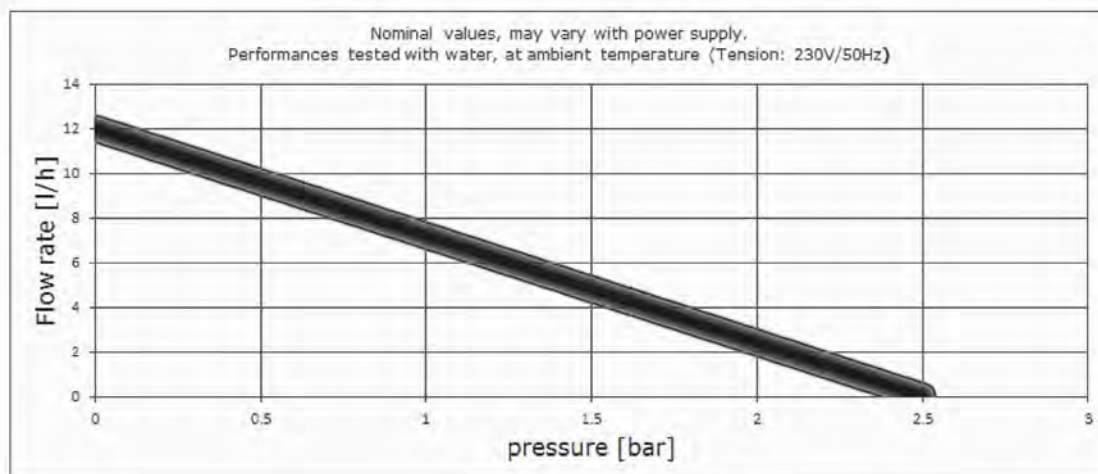
Noise level (1m): open flow = ~35 [dB(A)],
Max. pressure = ~29 [dB(A)]

Optional Mounting- Integral Heat Sink w/2ea 1/8" Holes
3/4" on center (see drawing)

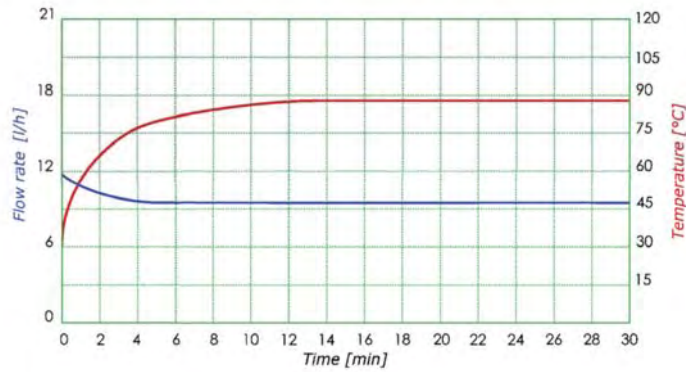
Weight- 95 g (0.2 lb)



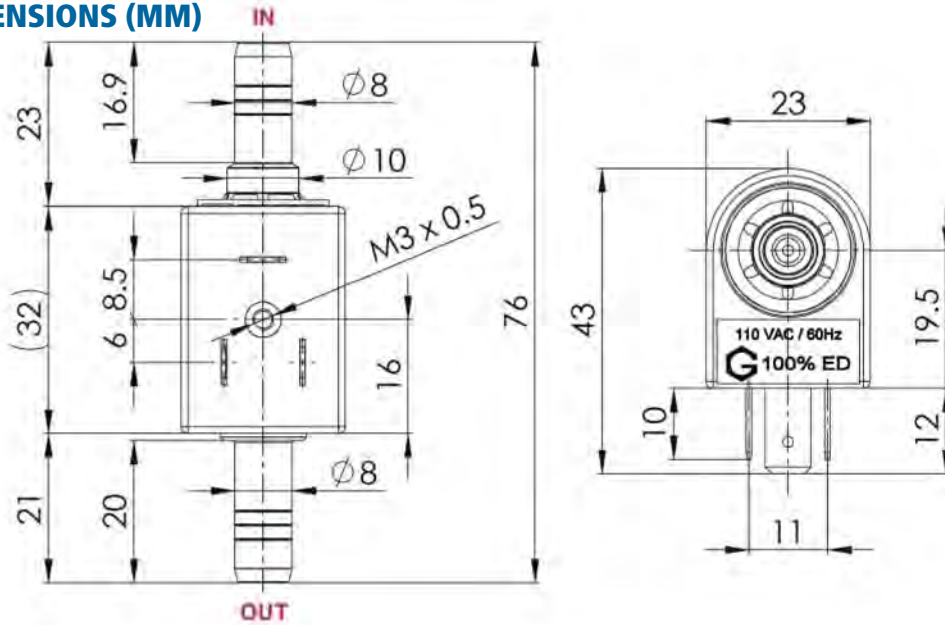
FLOW CURVES



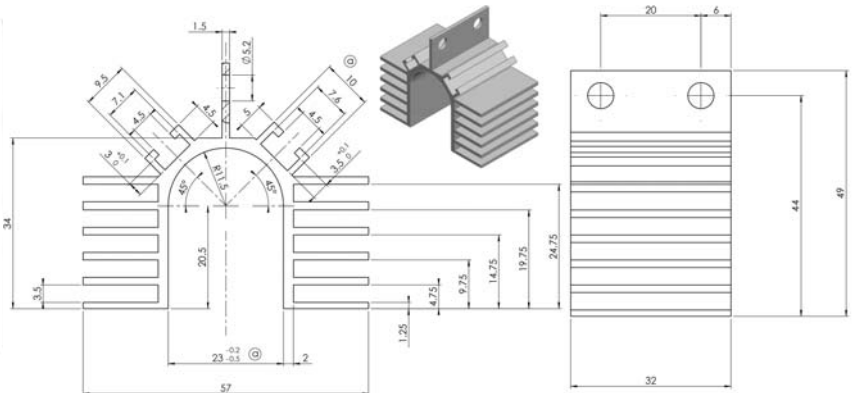
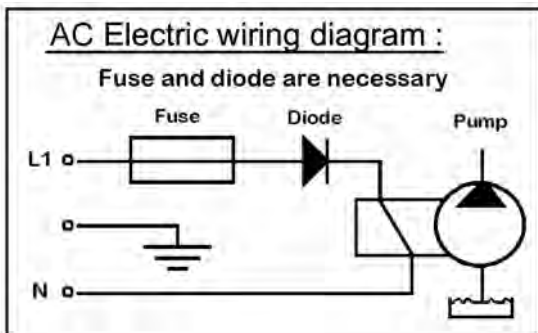
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



DIMENSIONS (MM)



ELECTRICAL



ORDERING INFORMATION

ABCDEF
EMX25TC24VS2V

A Model	B Valve Material	C Piston Coating	D Voltage	E Elec. Conn.	F #Valves
*EMX25=5/16" Hose Barb *Consult us with your OEM fitting requirements	T=Teflon P= PPS	C=Chrome	12V=12V 110V=110V 24V=24V 230V=230V	S=DIN Spade	2V=2Valves

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....600mm²/s

Particle Tolerance- 100 mesh

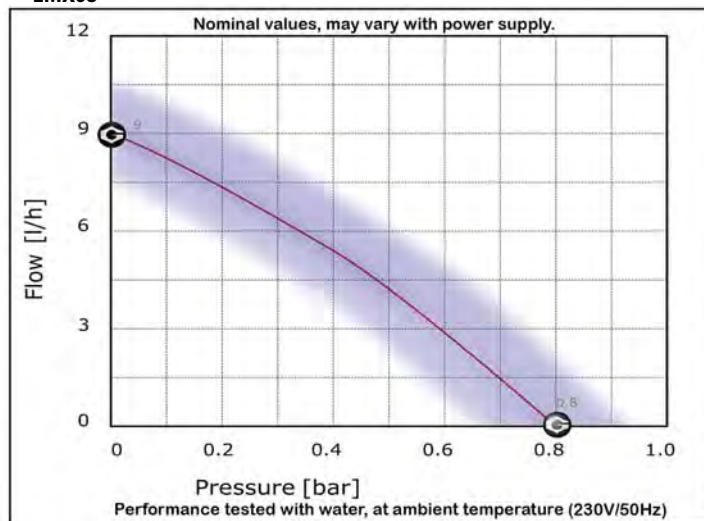
Frequency- 50/60 Hz

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)

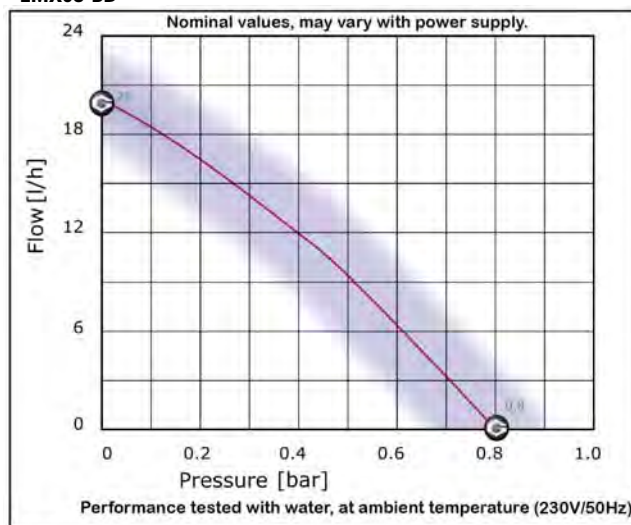


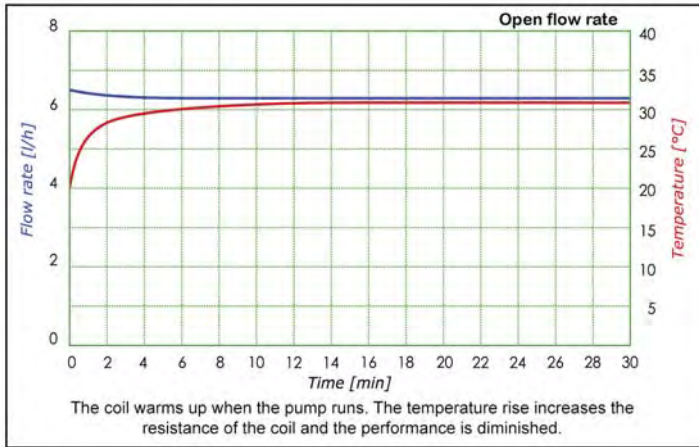
FLOW CURVES

EMX08

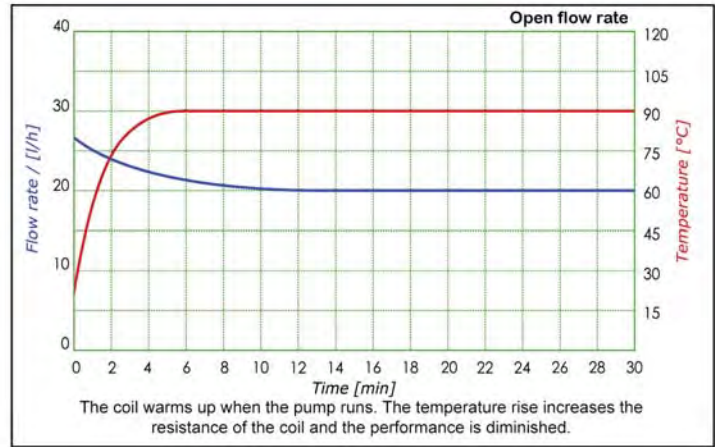


EMX08-BD

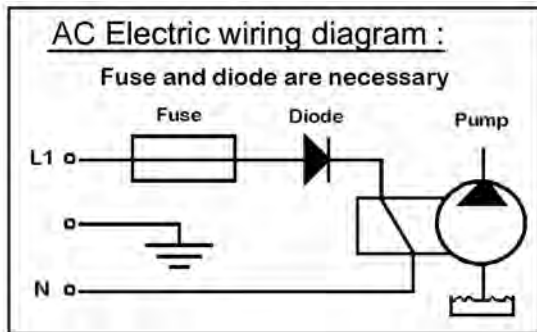


EMX-08

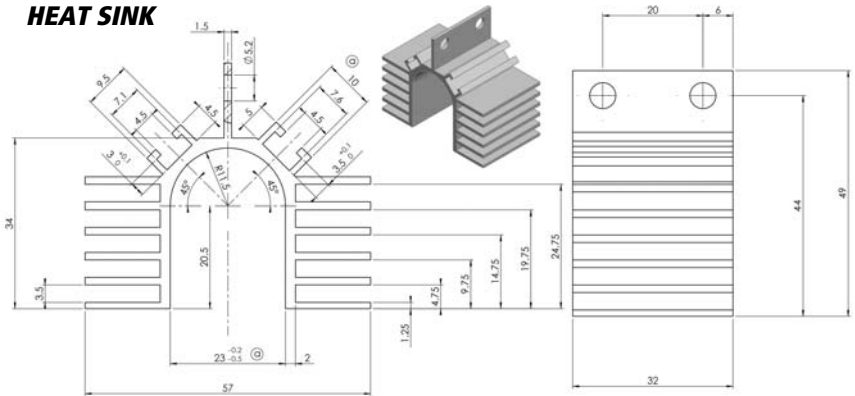
EMX-08BD



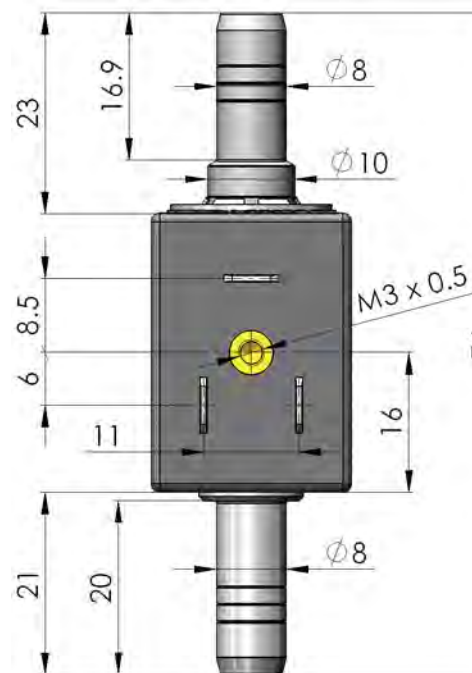
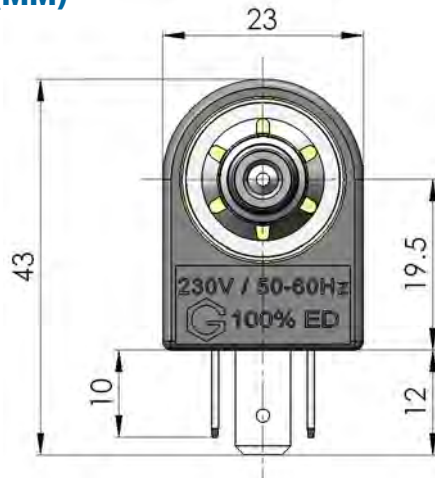
ELECTRICAL



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	T=Teflon	C=Chrome	12V=12V	S=DIN Spade	2V=2Valves
EME08= 1/8" NPT Male			110V=110V	L=Flying Leads	3V=3Valves
EMX08BD=5/16" Hose Barb			24V=24V		
EME08BD= 1/8" NPT Male			230V=230V	130mm	

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			

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...600mm²/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"

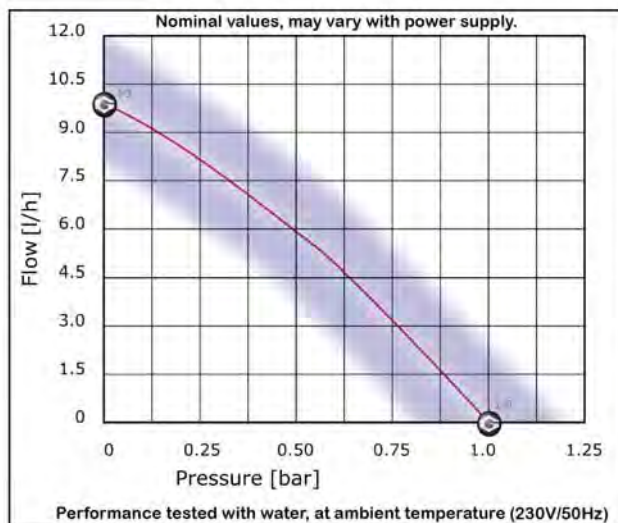
Holes 3/4" on center (see drawing)

Weight- 95 g (0.21lb)

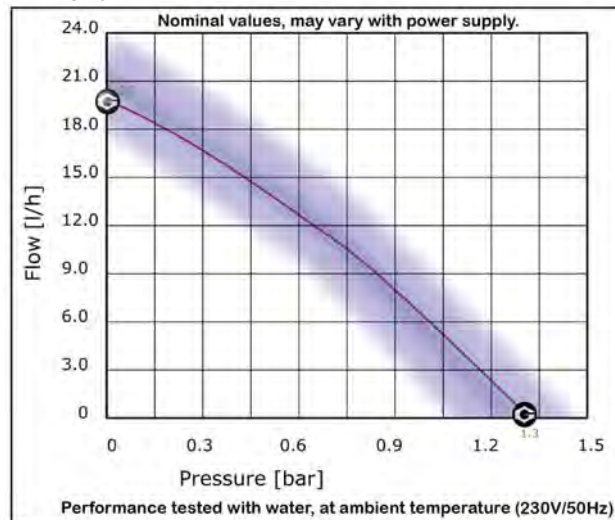


FLOW CURVES

EMS 10

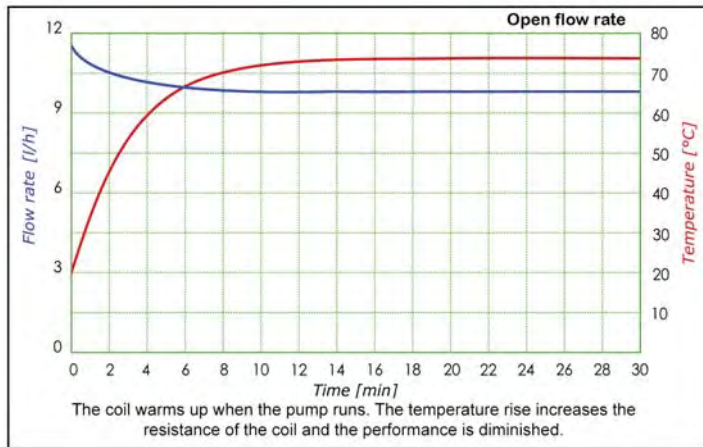


EMS 10-BD

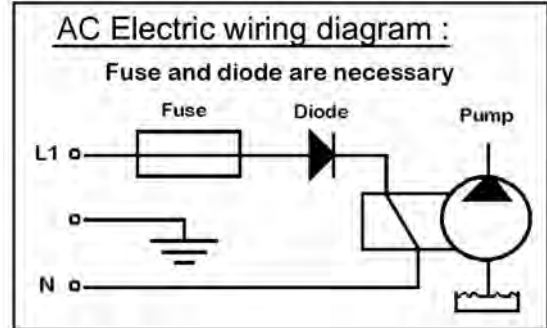


EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE

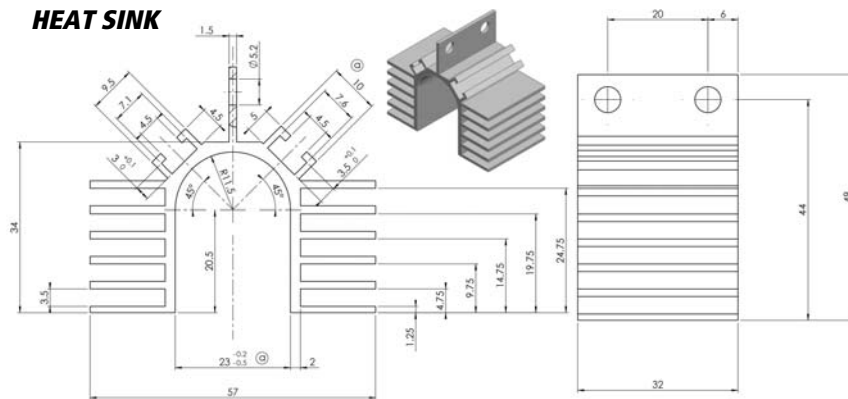
EMS 10



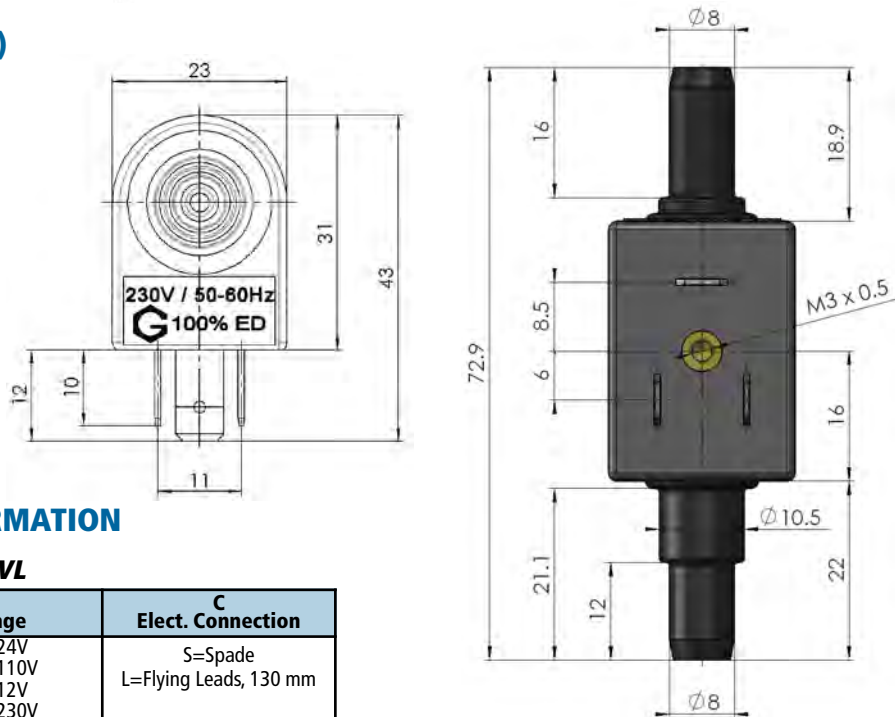
ELECTRICAL



HEAT SINK



DIMENSIONS (MM)



ORDERING INFORMATION

ABC
EXAMPLE: EMS10-24VL

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

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		

GOTEC

ET-200 Oscillating Piston Pump

Solenoid Operated, Flow to 20 L/H (5.28 GPH)

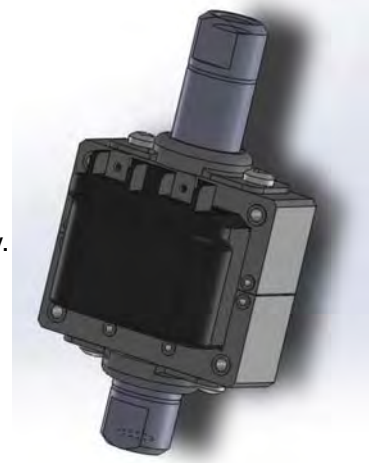
Pressure to 22 Bar (319 PSI)

DESCRIPTION

Model ET-200 oscillating piston pump is 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 pump will run without damage when the liquid flow is stopped momentarily.

The precision ground machined elements, piston and bushing, guarantees minimum wear and exceptional component life. With stainless steel connectors, piston and spring and NBR o-ring and PPS valve tips 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, 50/60 Hz, diode rectified

Wetted Pump Materials-303, 304, 316, & 431 SS

Connectors: AISI 431 SS (1.4057)

Piston: AISI 431 + Cr (1.4057 + Cr)

Springs: AISI 316 (1.4401)

Valve Tips: PPS

O-ring: NBR

Maximum Pressure- 22 bar (319 PSI)

Maximum Flow- Standard Vers., 20 L/H (5.28 GPH)

Viscosity Range- 1....600mm²/s

Max. Suction: 0.3 m (11.8 inches w.c.)

Particle Tolerance- 100 mesh

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

Power Consumption- 25 W

Insulation: Class F-100% ED / 20 [°C]

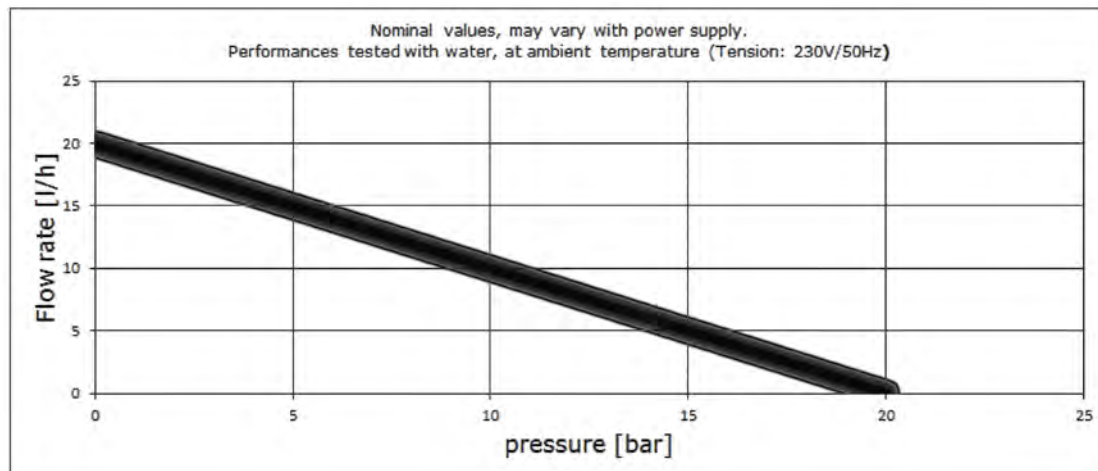
(Class H on request), Class II

Operating Factor- 100% continuous@ 68°F

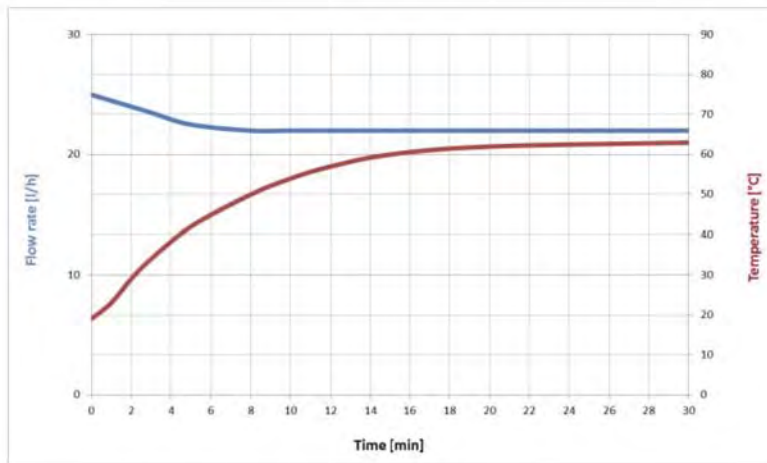
Ambient/Process Temperature Range- 1 to 50°C (33.8 to 122°F)

Weight- 440 g (0.97 lb)

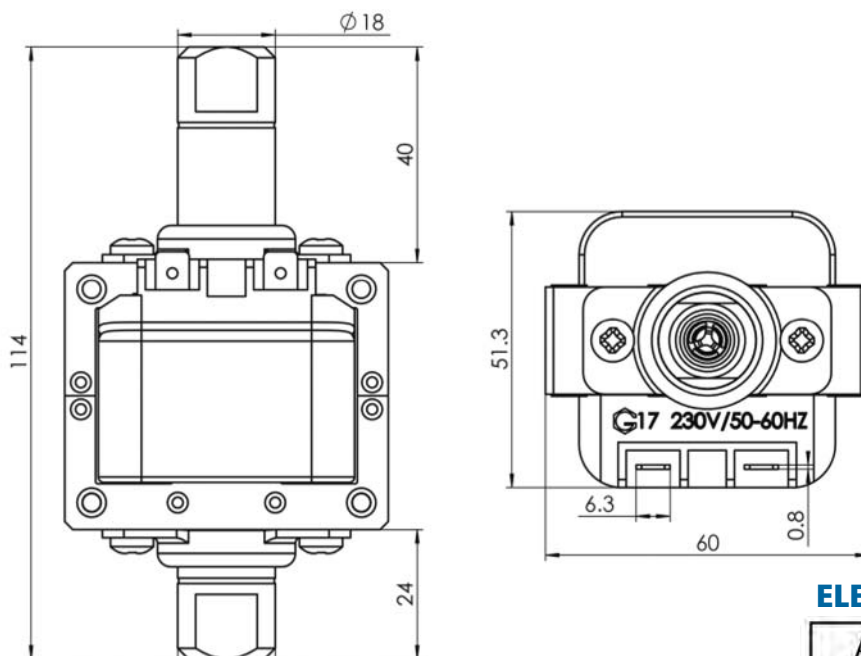
FLOW CURVES



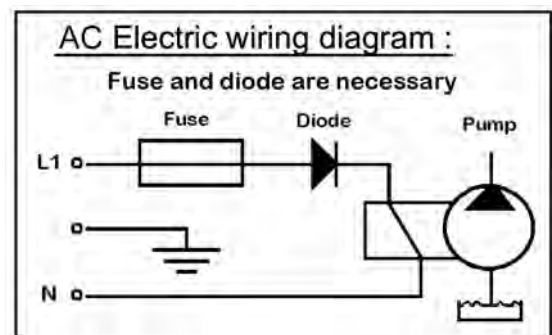
EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



DIMENSIONS (MM)



ELECTRICAL



ORDERING INFORMATION

ABCDEF EMX25TC24VS2V

A Model	B Valve Material	C Piston Coating	D Voltage
*ET200= G1/8 Female Threads *Consult us with your OEM fitting requirements	P= PPS	C=Chrome	12V=12V 110V=110V 24V=24V 230V=230V

Options	
Model	Description
Model PD-106	DC driver board, 9-35 VDC in, 9-35V pulsed DC out
Model 1N5406	Diode
106628	Heat Sink
19726.1	Mounting Plate
112170	Male G 1/8 to 1/8 NPT Male adapter

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 compatible 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 mm²/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)

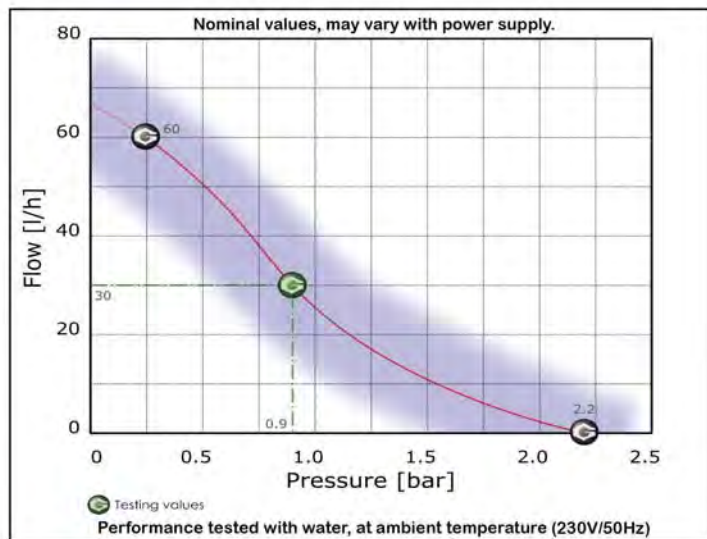
Noise level (1m)- Open flow = ~55 [dB(A)]

Max. pressure = ~48 [dB(A)]

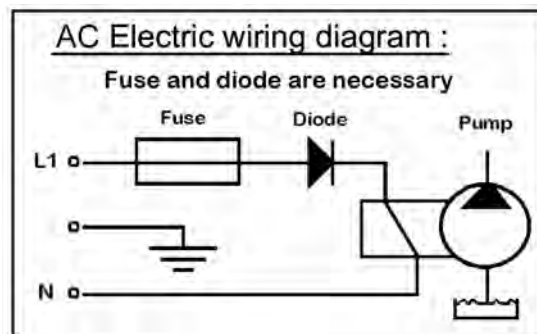
Weight- 450 g (.99 lb)



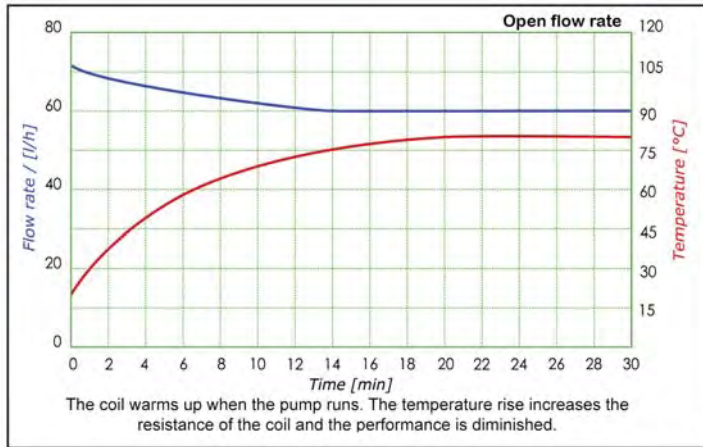
FLOW CURVE



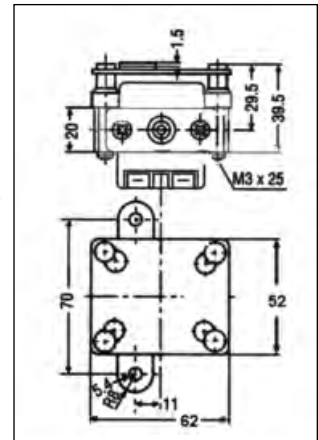
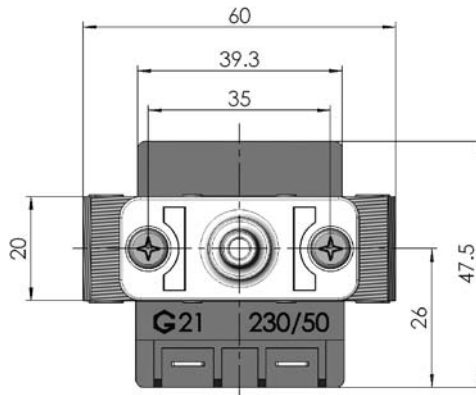
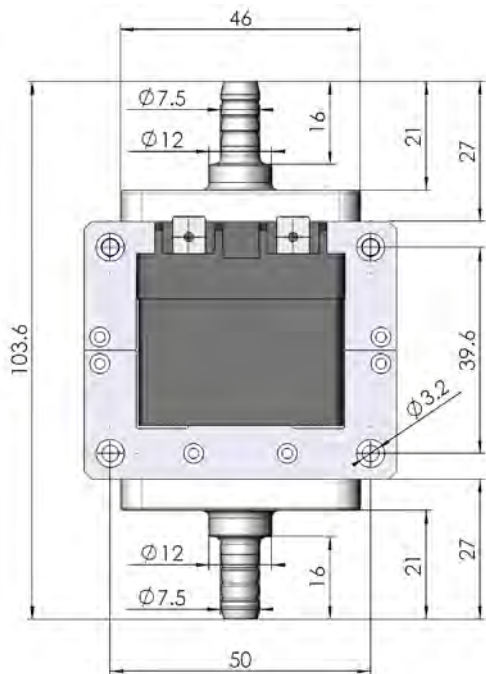
ELECTRICAL



EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



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		

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

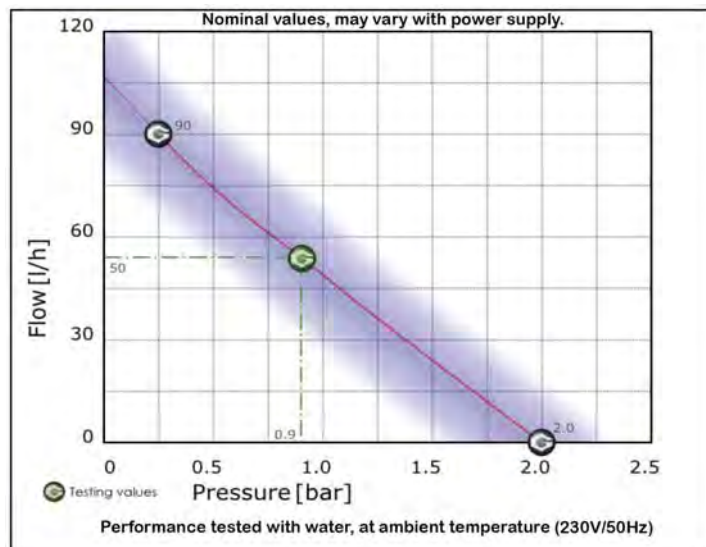
GENERAL

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 mm²/s
Particle Tolerance- 100 Mesh
Supply Voltage- 24, 110, 230VAC, diode rectified
Frequency- 50/60 Hz

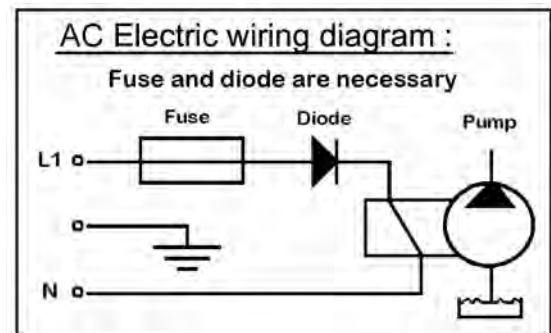


DC Operation: Optional model PD-106 DC driver board
Power Consumption- 40 W
Insulation: Class F-100% ED / 20 [°C]
(Class H on request), Class I (Class II on request)
Operating Factor- 100% continuous@ 68°F
Electrical Connections- 2 x 6.3 mm (1/4")x 0.8 mm
spade
Ambient/Process Temperature Range- 1 to 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)

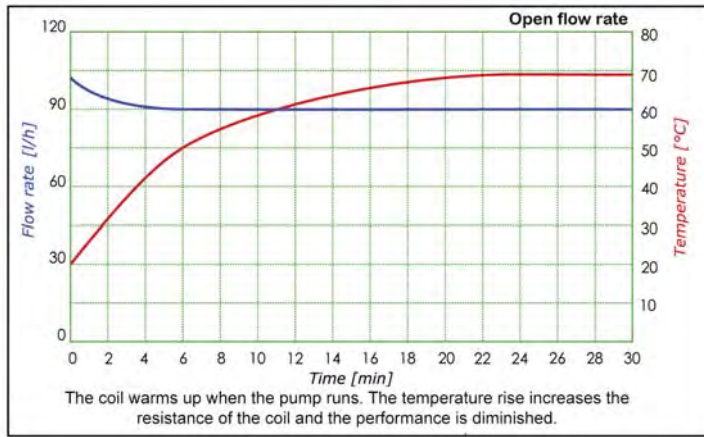
FLOW CURVE



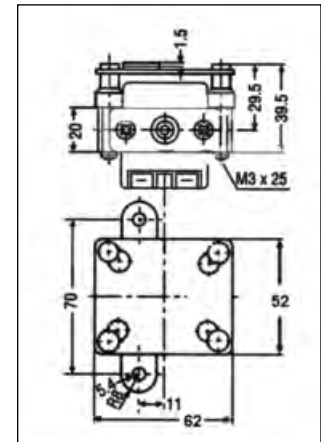
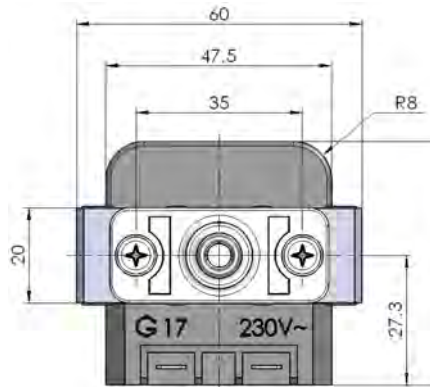
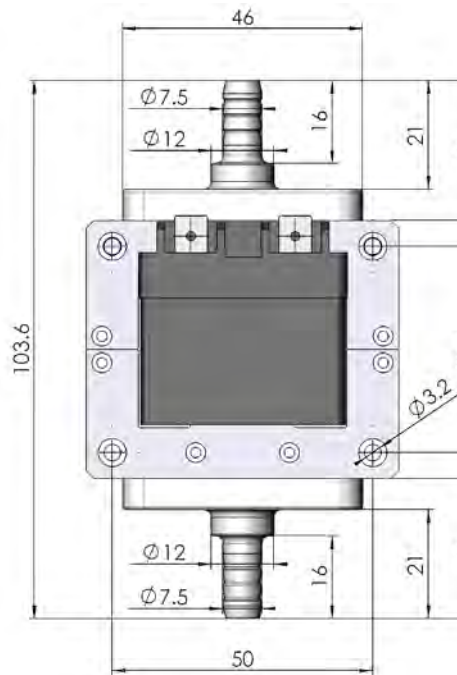
ELECTRICAL



EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



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		

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.

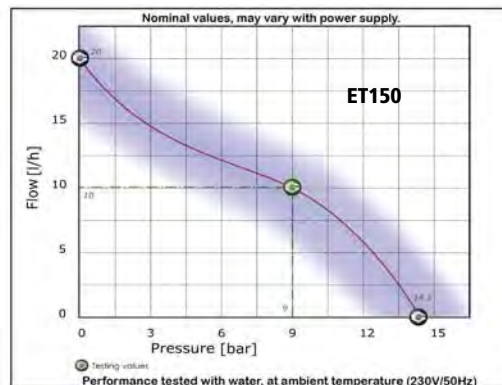
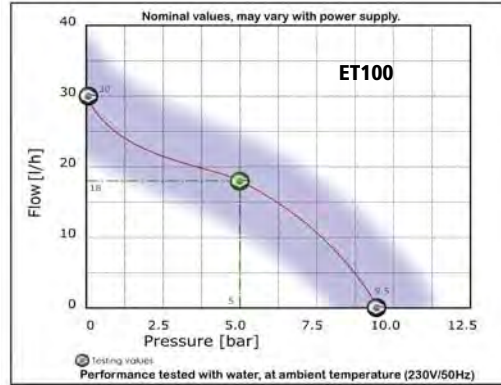
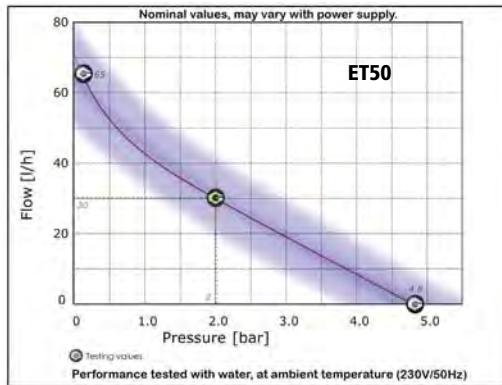
SPECIFICATIONS



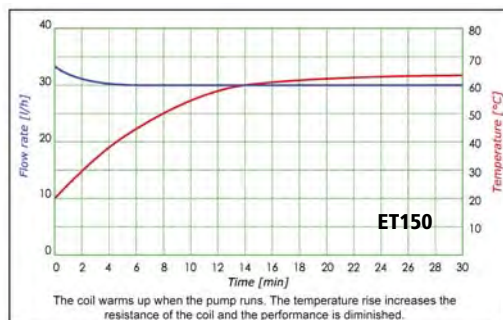
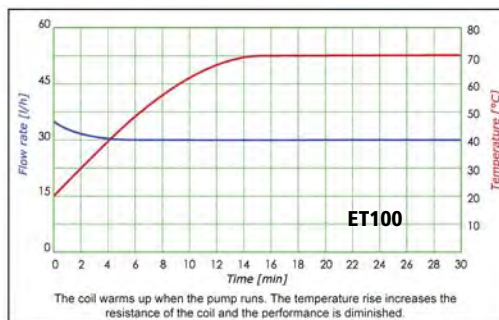
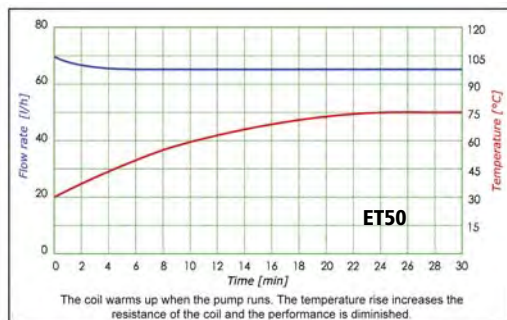
	ET50	ET100	ET150
Pump Piston	Chrome coated AISI 431 SS		
Pump Spring	AISI 316 SS		
Pump End Connections	AISI 303 SS w/G1/8 female thread or POM w/7.5 mm O.D.barb		
Valve/Seal Material	NBR		
Max Pressure	4.8 Bar (69.6 PSI)	9.5 Bar (138 PSI)	14.5 Bar (210 PSI)
Max Flow	65L/H (17.2 GPH)	30 L/H (7.93 GPH)	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		

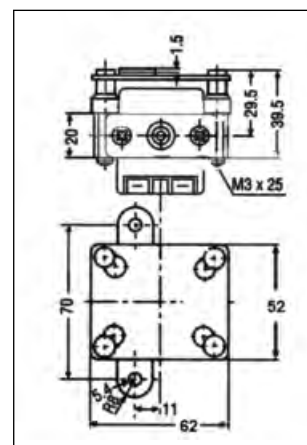
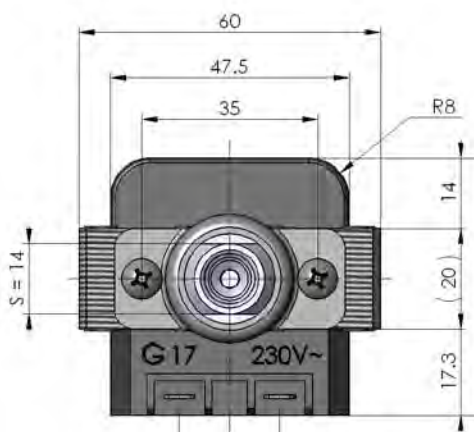
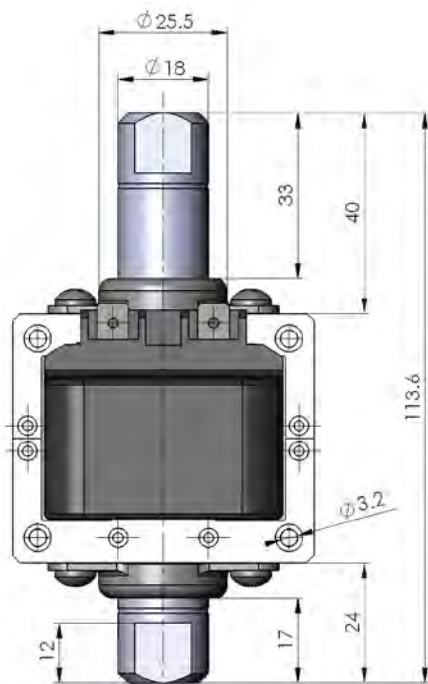
FLOW CURVES



EFFECT OF COIL TEMPERATURE RISE ON FLOW RATE



DIMENSIONS (MM)



Model 19726.1 Mounting
Plate

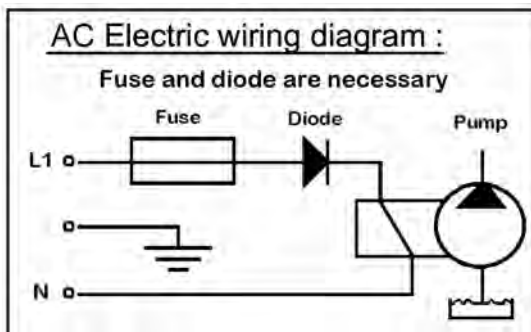
ORDERING INFORMATION ABCD (ETG100P24V60HZ)

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

ELECTRICAL



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

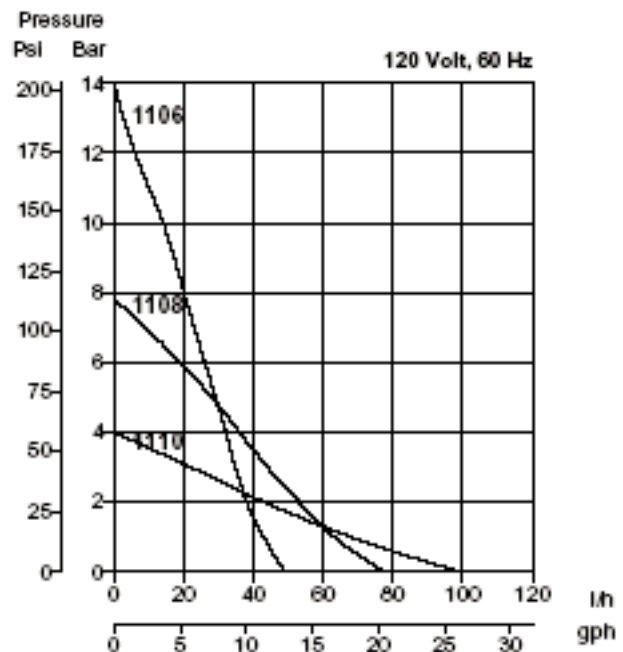
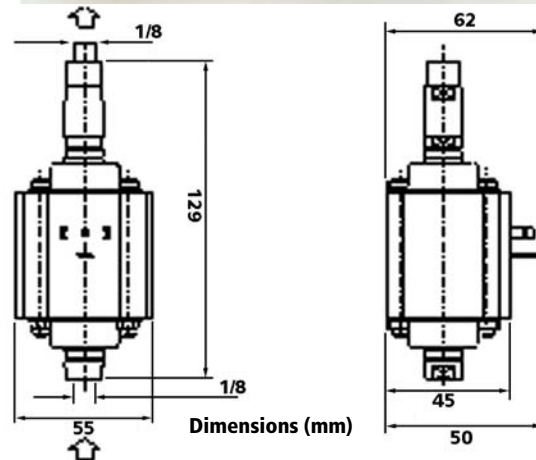
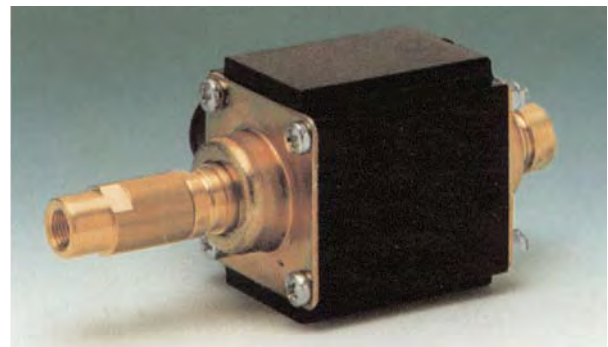
Inlet/Outlet Connections: 1/8" NPT brass

Flow: Dependent on piston size, see flow chart

Model 1106- 6mm piston

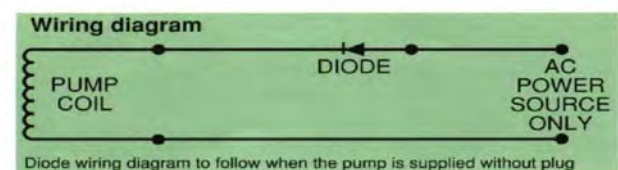
Model 1108- 8mm piston

Model 1110- 10mm piston



ORDERING INFORMATION

Model	Description
1106RLIFM9E	6 mm Piston
1108RLIFM9E	8 mm piston
1110RLIFM9E	10 mm piston



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

Accessories: Units supplied with four screw mount Nylon circuit board supports. These mount to customer enclosure/chassis with self-tapping no. 6 screws (not supplied)

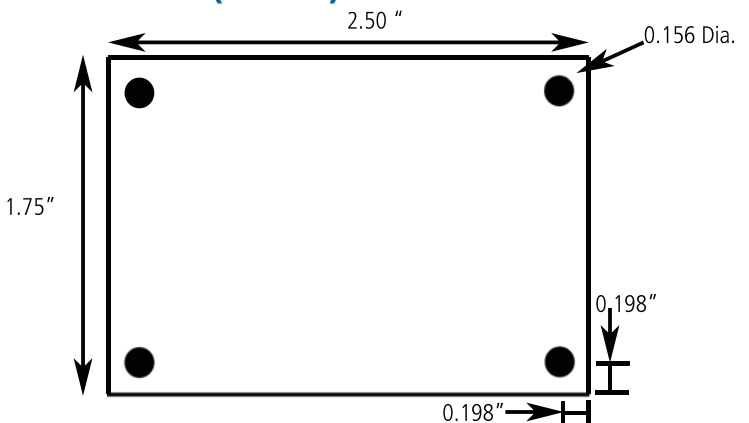
Dimensions: 2.50"W x 1.75" D x 0.91" Max. H (not including board supports)

Packaging: 4" x 6" ESD shielding bag

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.

WIRING



ORDERING INFORMATION

MODEL NUMBER: PD-106

PUMP ENGINEERING

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

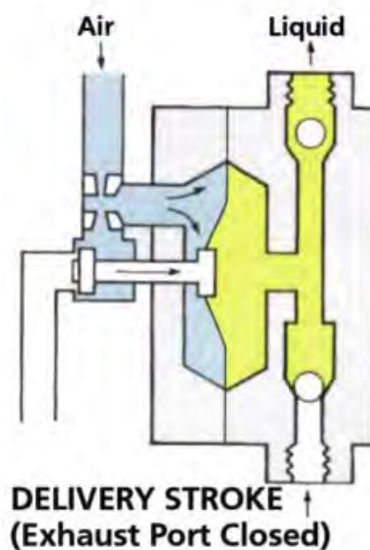
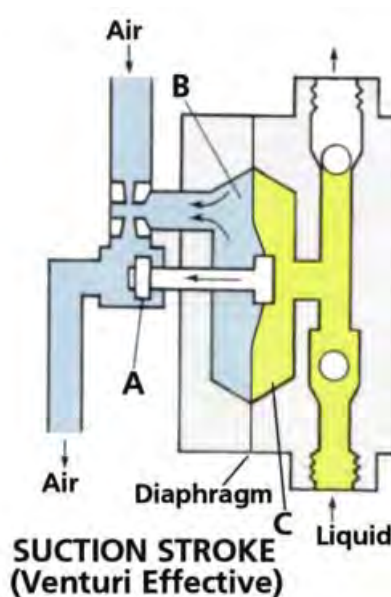
GENERAL

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.



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)

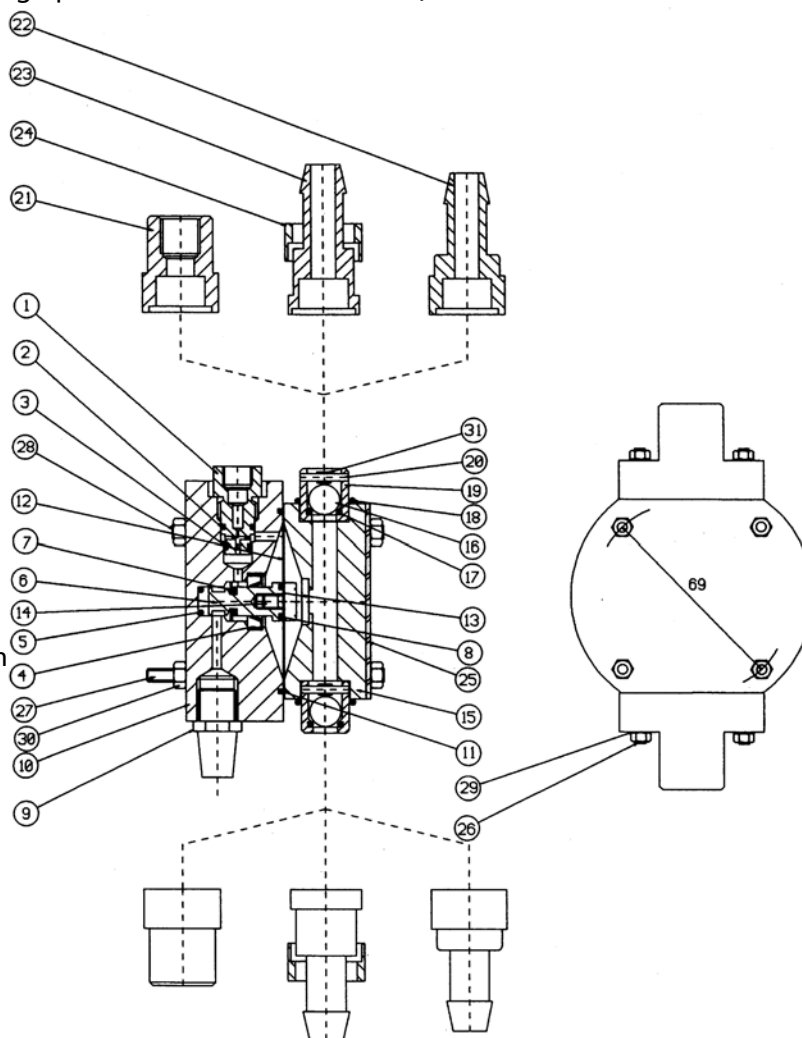
Seals-	EPDM (some chemicals and solvents)
	Nitrile (for water, caustic soda and mineral oils)
	FPM (for acids, oils and fats, hydrocarbons)
	Chemraz® (for MEK, THF, DMF, toluene, amines, etc.)

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

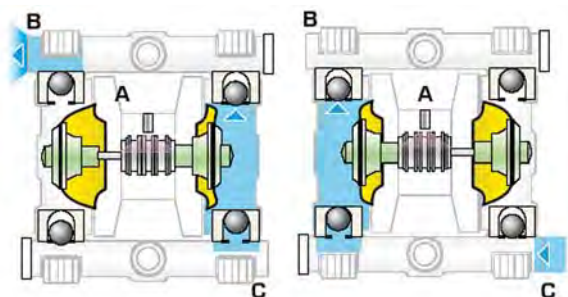
Debem air operated diaphragm pumps are characterized by exceptional performance, power and strength, making them ideal for pumping liquids with very high apparent viscosity up to 50000 cps (at 20°C), even if containing suspended solids.

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.

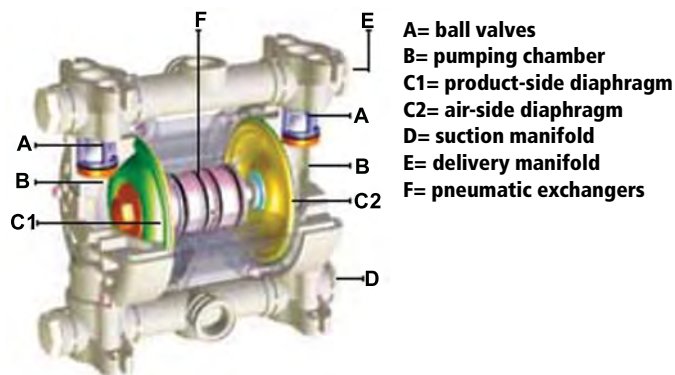
They are specifically designed for demanding applications with high humidity or in potentially explosive atmospheres (ATEX certification).



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.



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

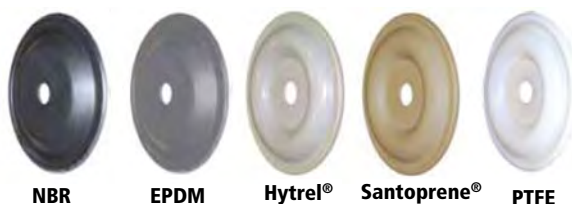
PNEUMATIC EXCHANGERS

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.



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 distribution:

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.

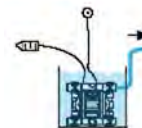
Santoprene® is a registered trademark of Exxon Mobile.

INSTALLATION

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



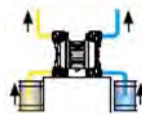
Self-priming (max. viscosity 10000 cps at 20° C)



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



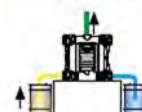
Drum transfer (max. viscosity 10000 cps at 20° C)



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).



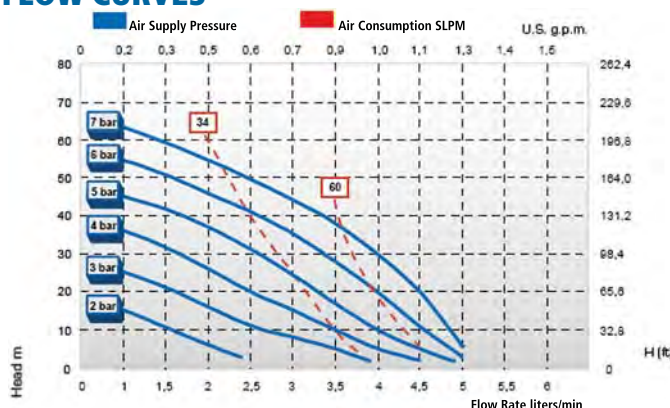
SPECIFICATIONS

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 Ⓔ II 3/3 GD c IIB T135°C (for zone 2)

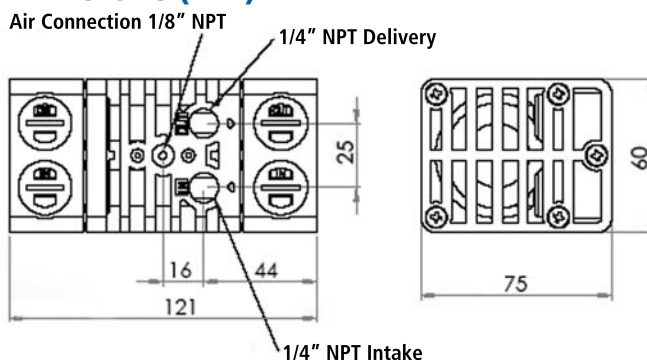
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber), made from conductive plastic. Ⓔ II 2/2 GD c IIB T135°C (for zone 1)

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: 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

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 Ⓜ 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)

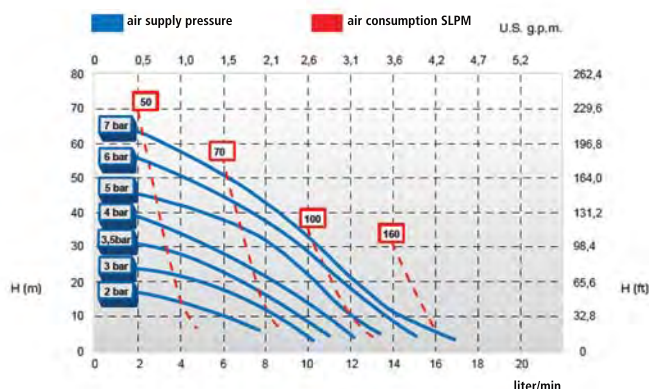
ORDERING INFORMATION

ABCDEFGH

Example: CU15ECNTTET

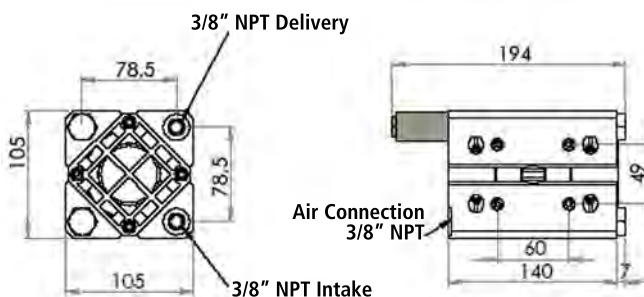
A Model	B Pump Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Balls	F Ball Seats	G O Rings	Options
CU15	P= Polypropylene EC= ECTFE	N= NBR	T= PTFE	T=PTFE A= AISI 316 D= EPDM (PP Body Only)	P= Polypropylene (PP Body Only) A= AISI 316 I= PE-UHMV (PP Body Only) E= ECTFE (ECTFE Body Only)	D= EPDM V= Viton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

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)



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 Ⓜ 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)

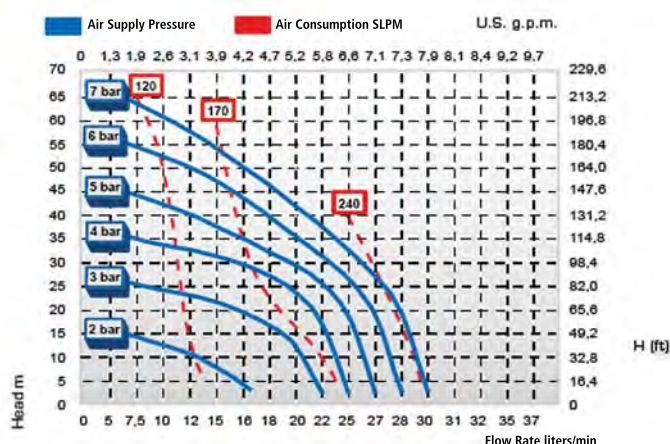
ORDERING INFORMATION

ABCDEFG

Example: MICRAHTTAT

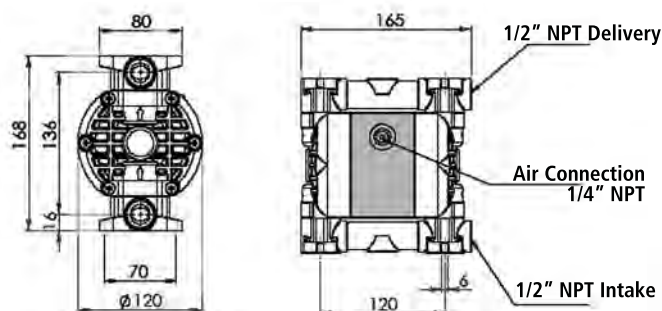


FLOW CURVES



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)



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 (Alu- minum & PVDF Bodies Only)	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 L= Aluminum Pump Body Polypropylene Ball Seats P, A, I F, A L, I A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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).

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 Ⓜ 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)

ORDERING INFORMATION

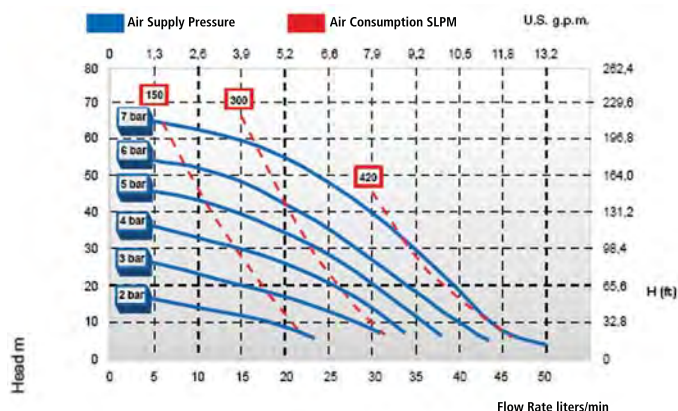
ABCDEFGH

Example: B50AHTTAT



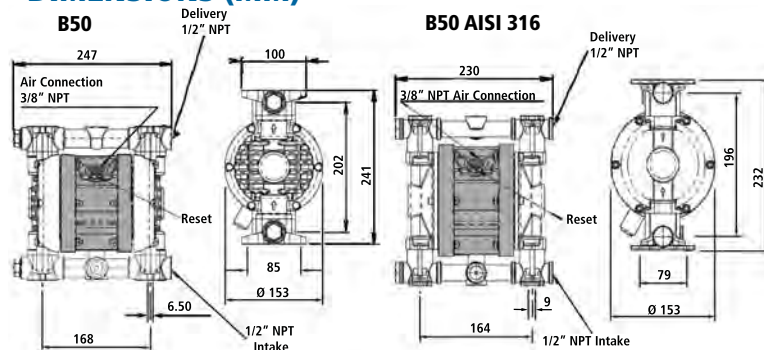
B50 Aluminum

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)



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 Polypropylene PVDF Aluminum AISI 316 SS Balls T,D,N,A T, A T,D,N,A A	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 L= Aluminum Pump Body Polypropylene PVDF Aluminum AISI 316 SS Ball Seats P, A, I F, A L, I A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	= None X= Twin Manifold C= CONDUCT ATEX Rating

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).

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; AISI316 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 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)

ORDERING INFORMATION

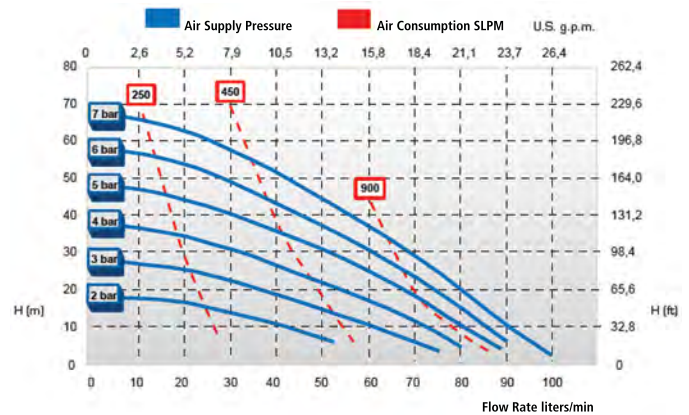
ABCDEFGH

Example: B80AHTTAT



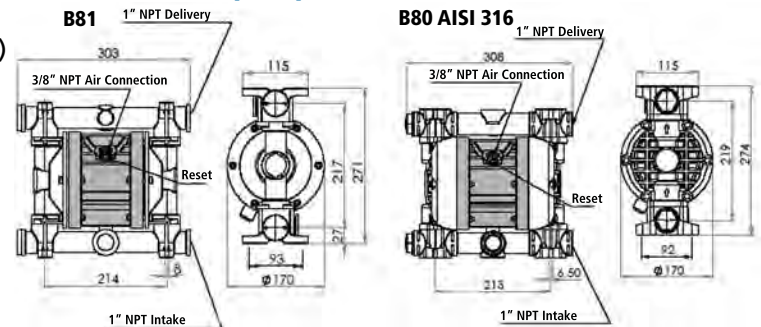
B80 PP

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)



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 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 P, A, I Polypropylene F, A PVDF L, I Aluminum A AISI 316 SS A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	= None X= Twin Manifold C= CONDUCT ATEX Rating

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.

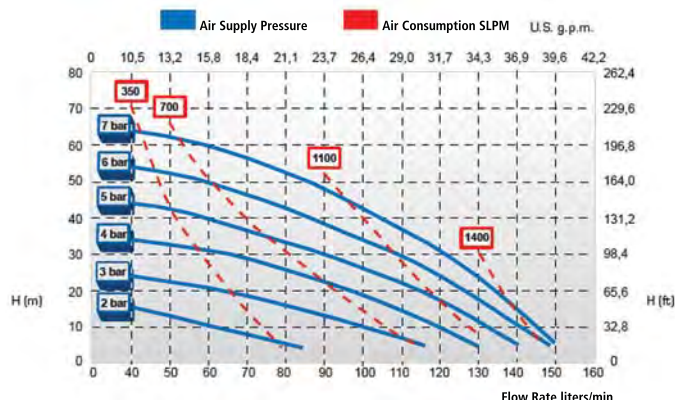
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



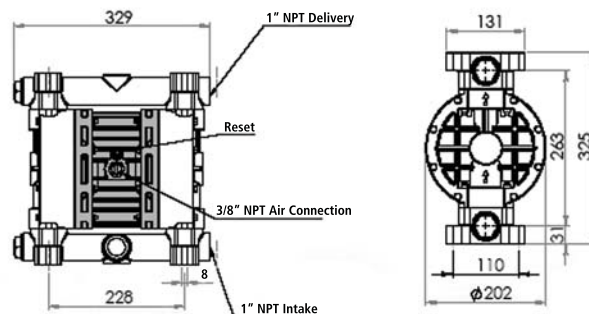
B100 Aluminum

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)



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; AISI316 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 Ⓜ 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)

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 Polypropylene PVDF Aluminum AISI 316 SS Balls T,D,N,A T,A T,D,N,A A	P= Polypropylene F= PVDF I= PE-UHMV A= AISI 316 R= PPS-V Pump Body Polypropylene PVDF Aluminum AISI 316 SS Ball Seats P, A, I F, A R, I A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	= None X= Twin Manifold C= CONDUCT ATEX Rating

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.

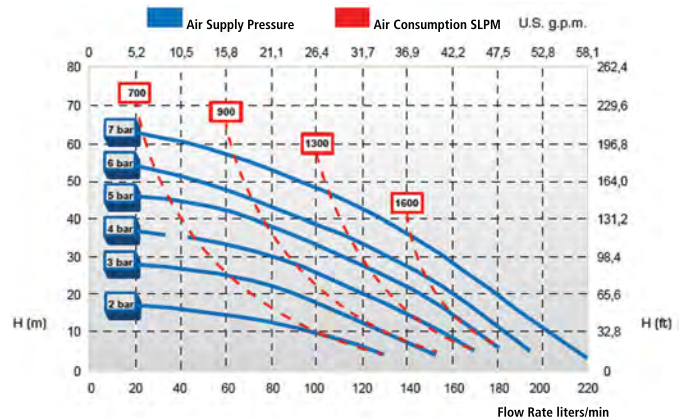
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



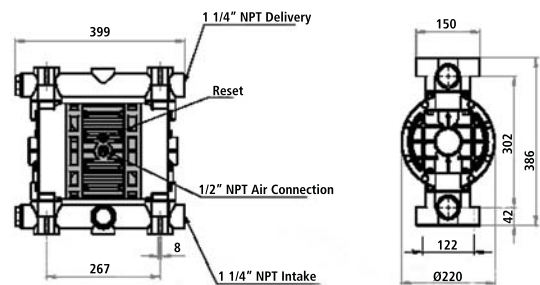
B150 AISI 316 SS

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.

DIMENSIONS (MM)



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; AISI316 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 Ⓔ 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)

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 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 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

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.

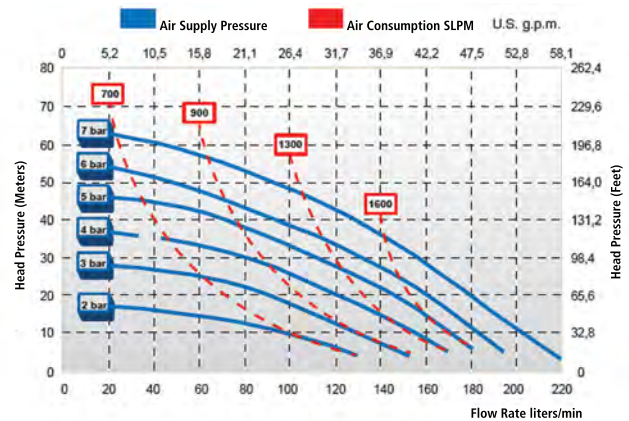
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



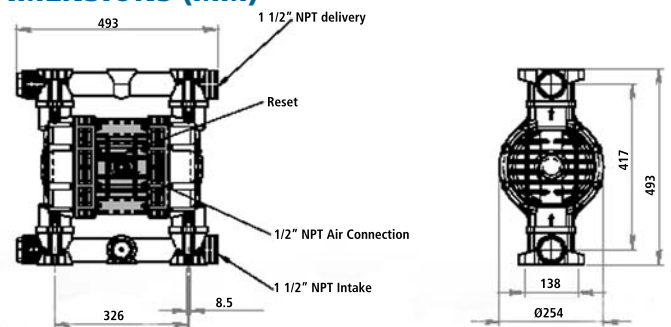
B251 Polypropylene

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.

DIMENSIONS (MM)



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; AISI316 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 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)

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 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 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

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.

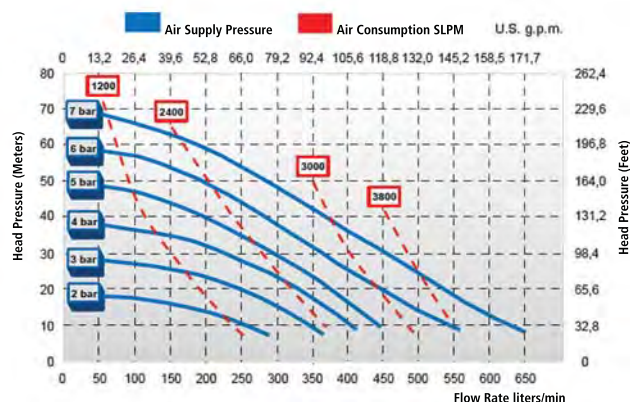
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



B502 PVDF

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

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)

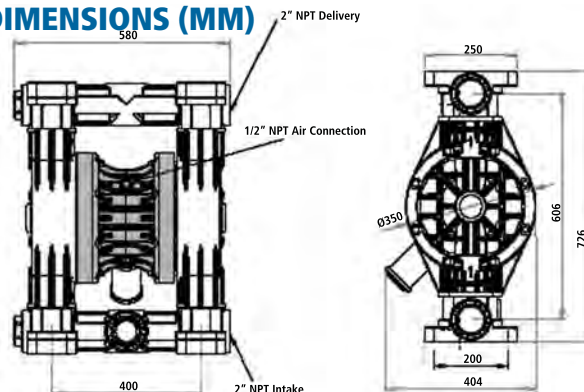
ATEX Ratings:

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)

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 Polypropylene PVDF Balls T,D,N,A T, A	P= Polypropylene F= PVDF I= PE-UHMV Pump Body Polypropylene PVDF Ball Seats P, I F	D= EPDM V= Viton	-= None X= Twin Manifold C= CONDUCT ATEX Rating

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.

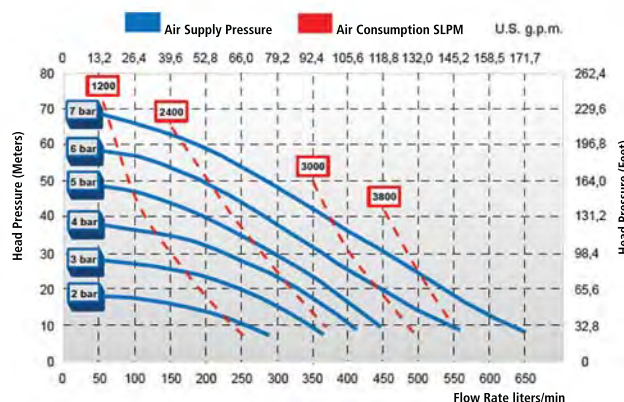
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



B502 Aluminum

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

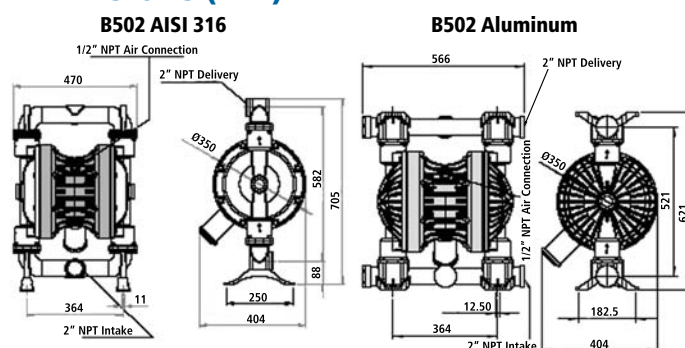
Pump Body Materials: Aluminum, AISI 316 SS
 Intake/delivery Connections: 2" NPT Female
 Air Connection: 1/2" NPT Female
 Max. Self-Priming Capacity: 4 meters (13.17 ft)
 Max. Flow Rate: 650 l/min (89.8 GPM)
 Max. Head: 70 m (99.7 PSI)
 Max. Air Supply Pressure: 7 bar (102 PSI)
 Max. Diameter of Passing 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 Ⓔ 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)

DIMENSIONS (MM)



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 Aluminum AISI 316 SS Balls T,D,N,A A,T	D= EPDM I= PE-UHMV A= AISI 316 L= Aluminum Pump Body Aluminum AISI 316 SS Ball Seats L,D,I A	D= EPDM V= Viton S= Silicone N= NBR T= PTFE	= None X= Twin Manifold C= CONDUCT ATEX Rating

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.

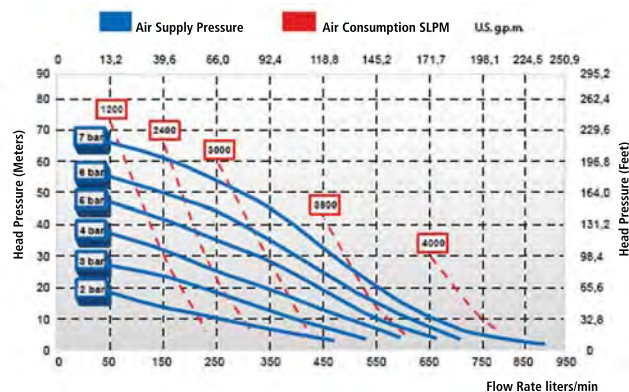
In addition, the huge choice of construction materials allows selection of optimum chemical compatibility with the fluid and/or environment without neglecting the temperature range.

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



FLOW CURVES

B503 Polypropylene



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

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)

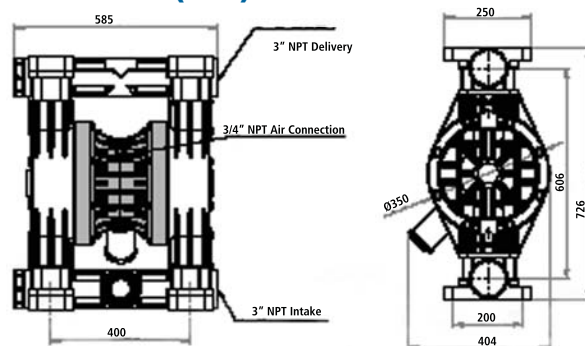
ATEX Ratings:

STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.

ATEX Classification 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)

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 Polypropylene PVDF Balls T,D,N T	P= Polypropylene F= PVDF I= PE-UHMV Pump Body Polypropylene PVDF Ball Seats P, I F	D= EPDM V= Viton	= None X= Twin Manifold C= CONDUCT ATEX Rating

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).

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 Ⓔ 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)

ORDERING INFORMATION

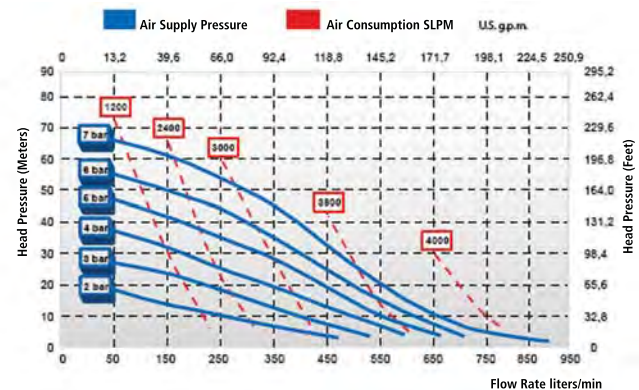
ABCDEFGH

Example: B503AHTTAT



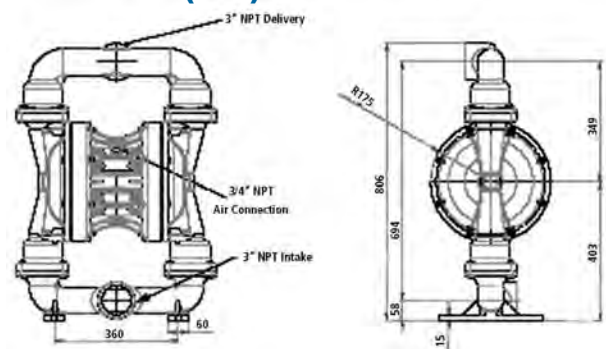
B503 AISI 316 SS

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.

DIMENSIONS (MM)



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 Aluminum AISI 316 SS Balls T,D,N A,T	N= NBR I= PE-UHMV A= AISI 316 L= Aluminum D= EPDM Pump Body Aluminum AISI 316 SS Ball Seats L,D,I,N A	D= EPDM V= Viton N= NBR T= PTFE	= None X= Twin Manifold C= CONDUCT ATEX Rating

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).

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:

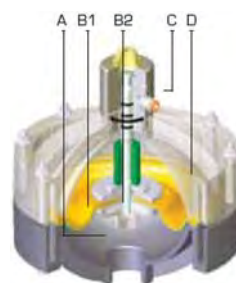
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.

ATEX Classification Ⓜ II 3/3 GD c IIB T135°C (for zone 2)

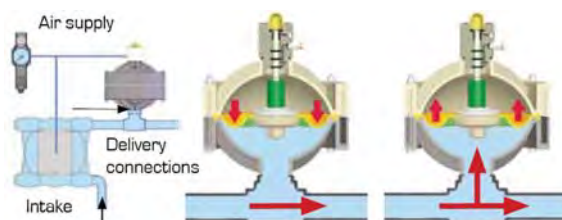
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). Ⓜ II 2/2 GD c IIB T135°C (for zone 1)



EQ51 Polypropylene



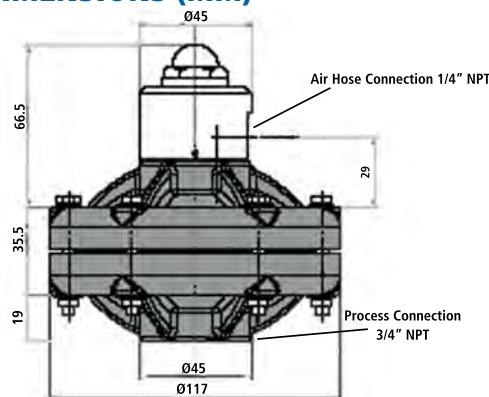
- A = expansion opening
- B1 = air-side diaphragm
- B2 = fluid-side diaphragm
- C = automatic pneumatic valve
- D = compressed-air chamber



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.

DIMENSIONS (MM)



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

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).

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 Ⓜ 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)

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

ORDERING INFORMATION

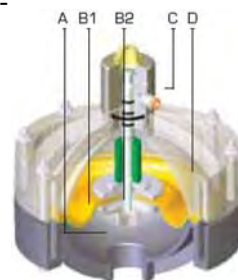
ABCDE

Example: EQ100PHT

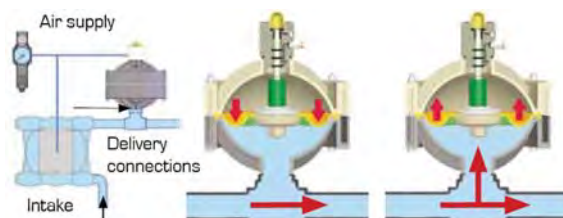
A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ100	P= PP FC= PVDF+CF R=PPS-V	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	= None C= CONDUCT ATEX Rating



EQ100 Polypropylene



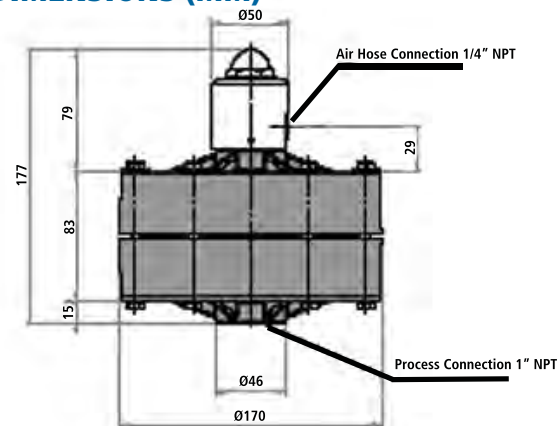
A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



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.

DIMENSIONS (MM)



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).

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:

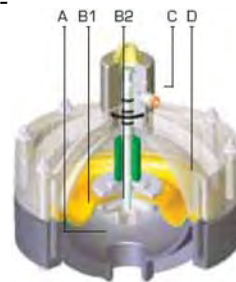
STANDARD version: Made from non-conductive plastic and/or with non-conductive center casing or from metal with non-conductive center casing.

ATEX Classification II 3/3 GD c IIB T135°C (for zone 2)

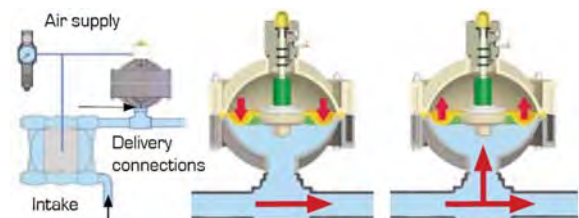
CONDUCT version: Built with pump casings and/or manifolds (PP + carbon fiber, ECTFE/PVDF + carbon fiber), made from conductive plastic and metal materials (aluminium, stainless steel). II 2/2 GD c IIB T135°C (for zone 1)



EQ200 Polypropylene



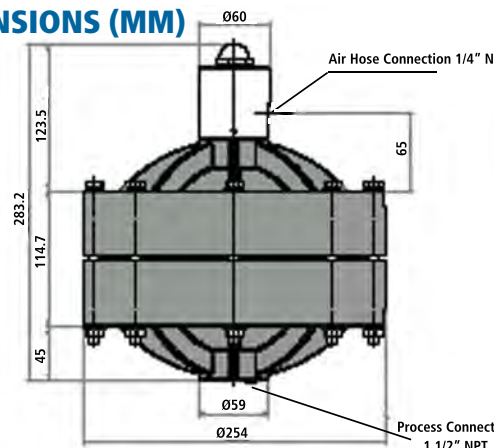
A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



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.

DIMENSIONS (MM)



Dampener Model	Use With Pump Model	Pump Housing Material
EQ200P (Polypropylene)	B100, B150, B251	PP
EQ200F (PVDF+CF)	B150, B251, B100	AlSi316
	B150, B251	PVDF
EQ200R (PPS-V)	B100, B150, B251	ALUMINUM

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

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).

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); PVDF/AISI 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 Ⓜ 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)

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

ORDERING INFORMATION

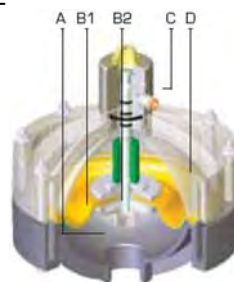
ABCDE

Example: EQ302PMT

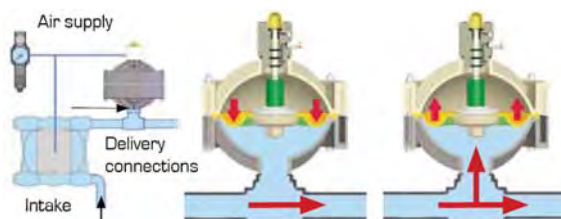
A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ302	P= PP FC= PVDF+CF A= AISI 316 AL= Aluminum	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	= None C= CONDUCT ATEX Rating



EQ302 Polypropylene



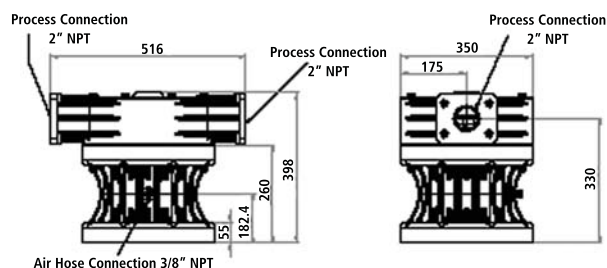
A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



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.

DIMENSIONS (MM)



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).

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); PVDF/AISI 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 Ⓢ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)

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

ORDERING INFORMATION

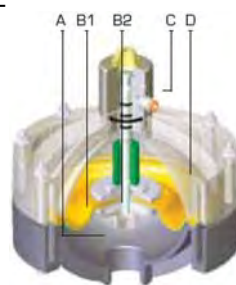
ABCDE

Example: EQ303PMT

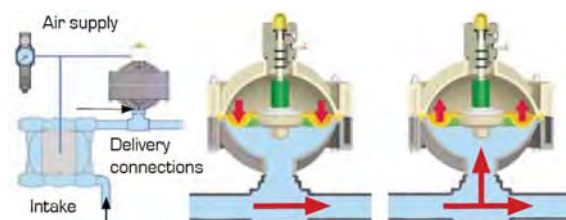
A Model	B Dampener Body	C Air Side Diaphragm	D Fluid Side Diaphragm	E Options
EQ303	P= PP FC= PVDF+CF A= AISI 316 AL= Aluminum	*H= Hytrel® M= Santoprene® *Hytrel not available with PVDF dampener body	T= PTFE	-= None C= CONDUCT ATEX Rating



EQ303 Polypropylene



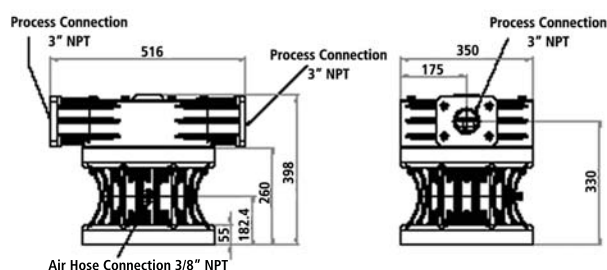
A = expansion opening
B1 = air-side diaphragm
B2 = fluid-side diaphragm
C = automatic pneumatic valve
D = compressed-air chamber



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.

DIMENSIONS (MM)



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 squeezed 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; USPXXI CLASS VI; 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 220°C. 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 200° 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 182°C

OCCCLUSION (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 necessary.

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 x 1.6	3.2 x 1.6	3.2 x 1.6	3.2 x 1.6
3.2 x 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				

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)

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 compatibility 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.

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 $\pm 15\%$ (tap water at 20°C)

Discharge Pressure: 50 kPa (7.26 psi)

Tube Material: Silicone (I.D. 1.5 mm)

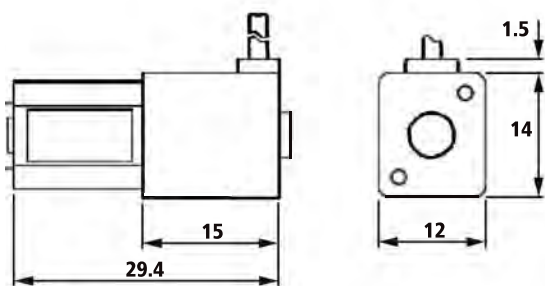
Motor: DC geared motor

Rated Voltage: 3 VDC

Power Consumption: 0.12 W

Weight: 11 g

DIMENSIONS (MM)



ORDERING INFORMATION

MODEL NUMBER

RP-Q1

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

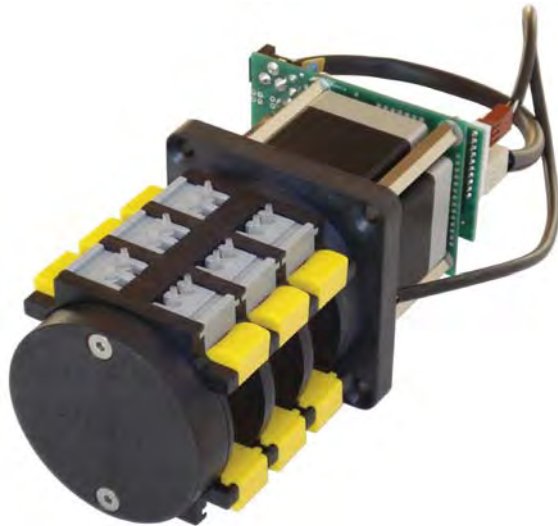


The pump head has a unique operating principle whereby the tubes are engaged with the rollers over a section of 95° only. This arrangement allows the installation of two tubes on both sides of the roller wheel with the advantage of 50% space saving, a balanced and much reduced motor load and less wear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

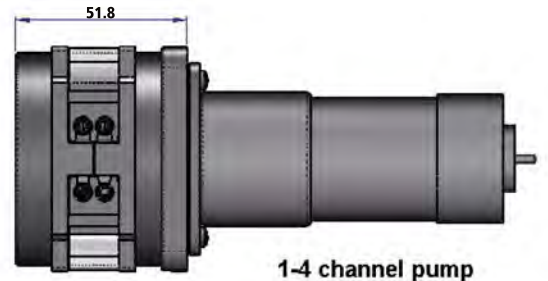
PUMP SPECIFICATION

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

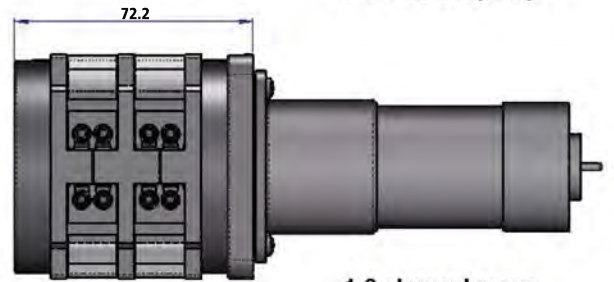
DIMENSIONS



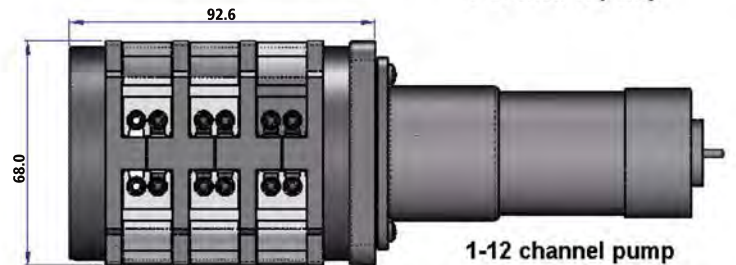
Stepper Motor Controlled Universe



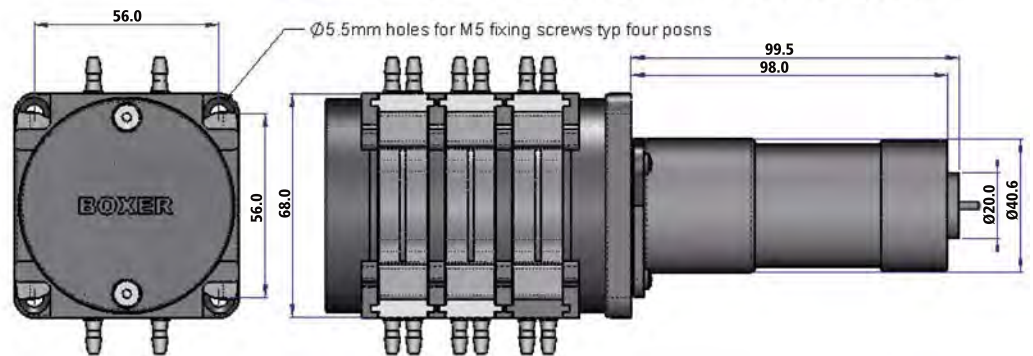
1-4 channel pump



1-8 channel pump



1-12 channel pump

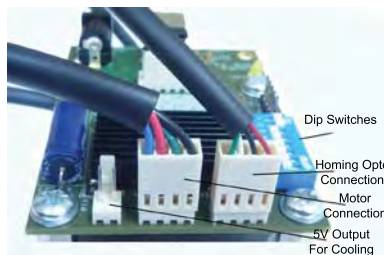


Model 6900.001 Stepper MotorControl Board

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
- Decelerate
- 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.

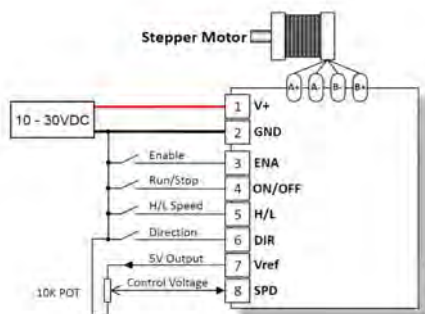
Required for installation but not supplied:

- 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.

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

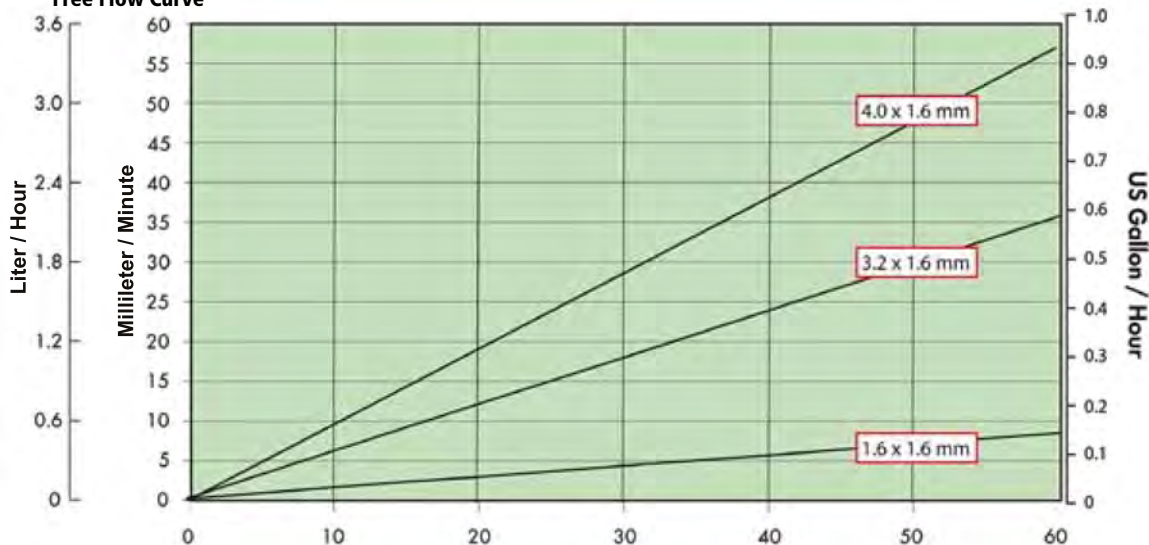
Options: 3-roller

Tube: Silicone, Verderprene®, Polypropylene tube
connectors provided

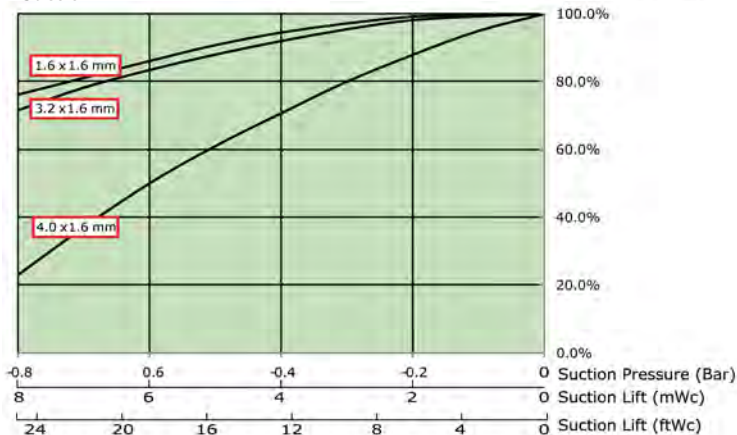
Tube Sizes (I.D x Wall Thickness) 1.6 x 1.6 mm, 3.2 x 1.6 mm, 4.0 x 1.6 mm



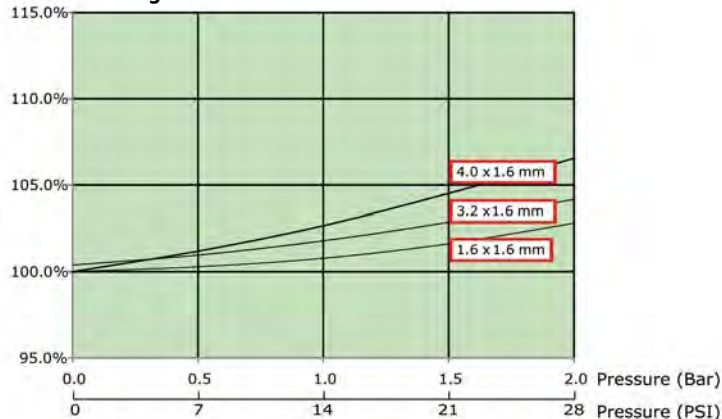
Free Flow Curve



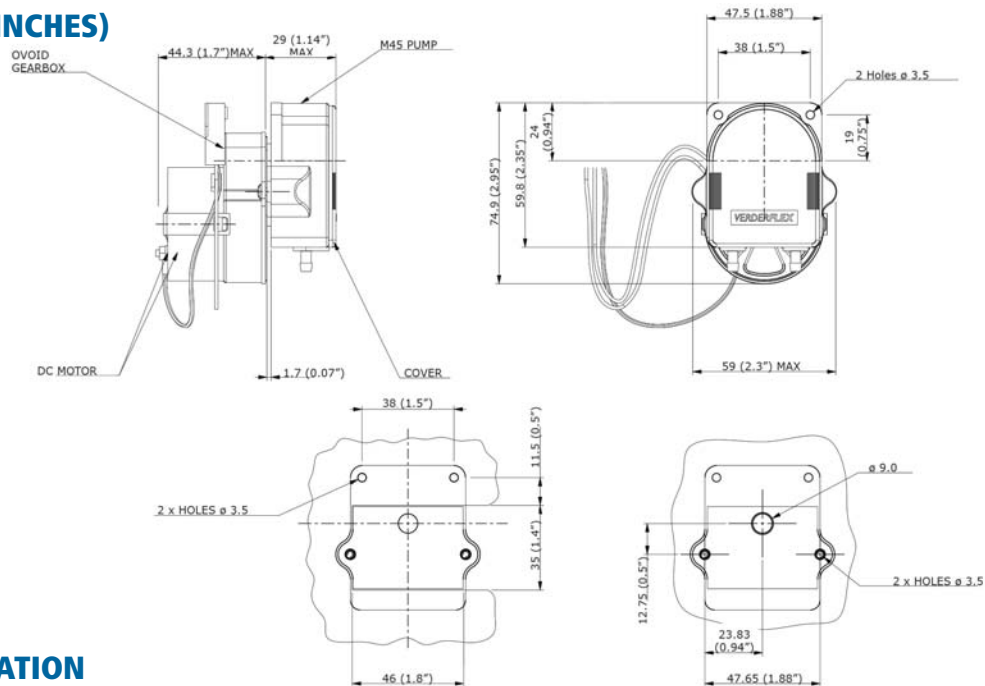
Suction



Discharge



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 μ l per rev. (3/4/6 rollers)

2 mm ID Tube- 160/148/106 μ l per rev. (3/4/6 rollers)

3 mm ID Tube- 381/325/191 μ l 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 μ l per rev. (3/4/6 rollers)

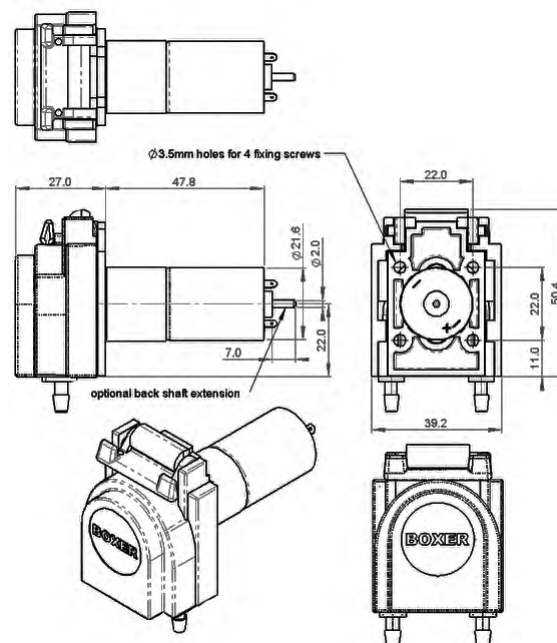
Tube Materials: Silicone, Lagoprene, PHI or ED-Plex

Weight: 130g

Options: Back shaft motor encoder, 10 pulses per motor revolution (consider gearbox ratio for pulses per pump rotor revolution)

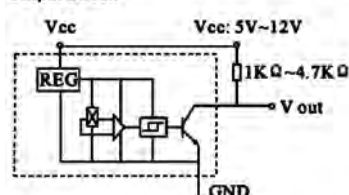


DIMENSIONS (MM) WITH DC MOTOR

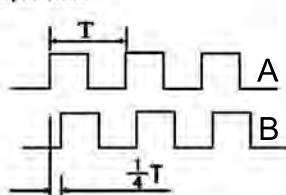


BACK SHAFT ENCODER

Output Circuit

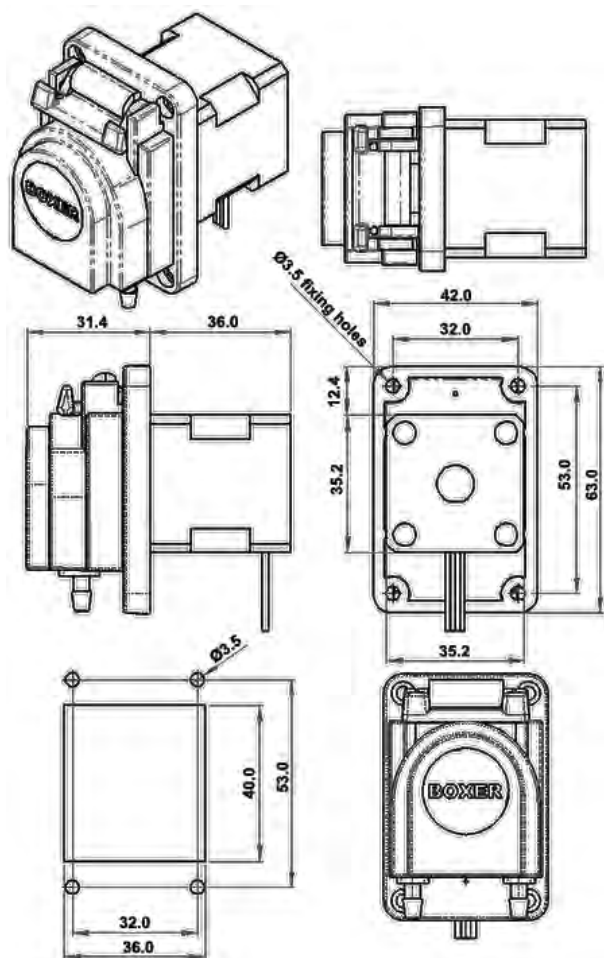


Output Wave



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



ORDERING INFORMATION

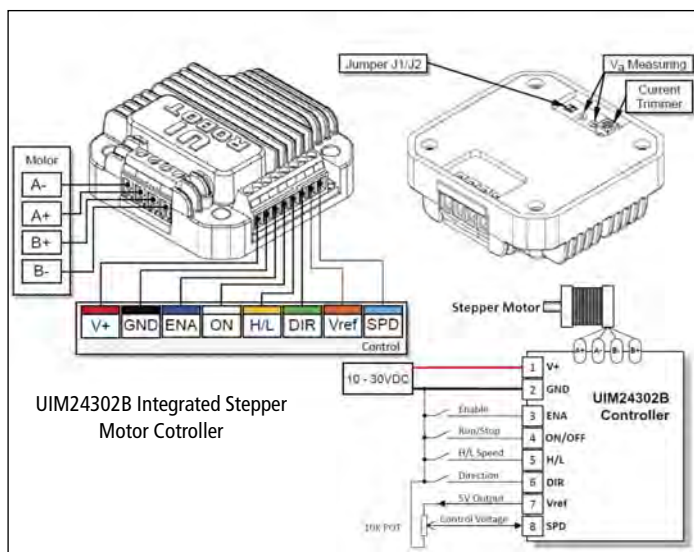
- 1) Select pump model
- 2) Select tubing model
- 3) Select any additional accessories

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

NEMA 17 STEPPER MOTOR CONTROLLERS

ROTATIONAL SPEEDS TO 780 RPM



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.

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 Controller

* 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

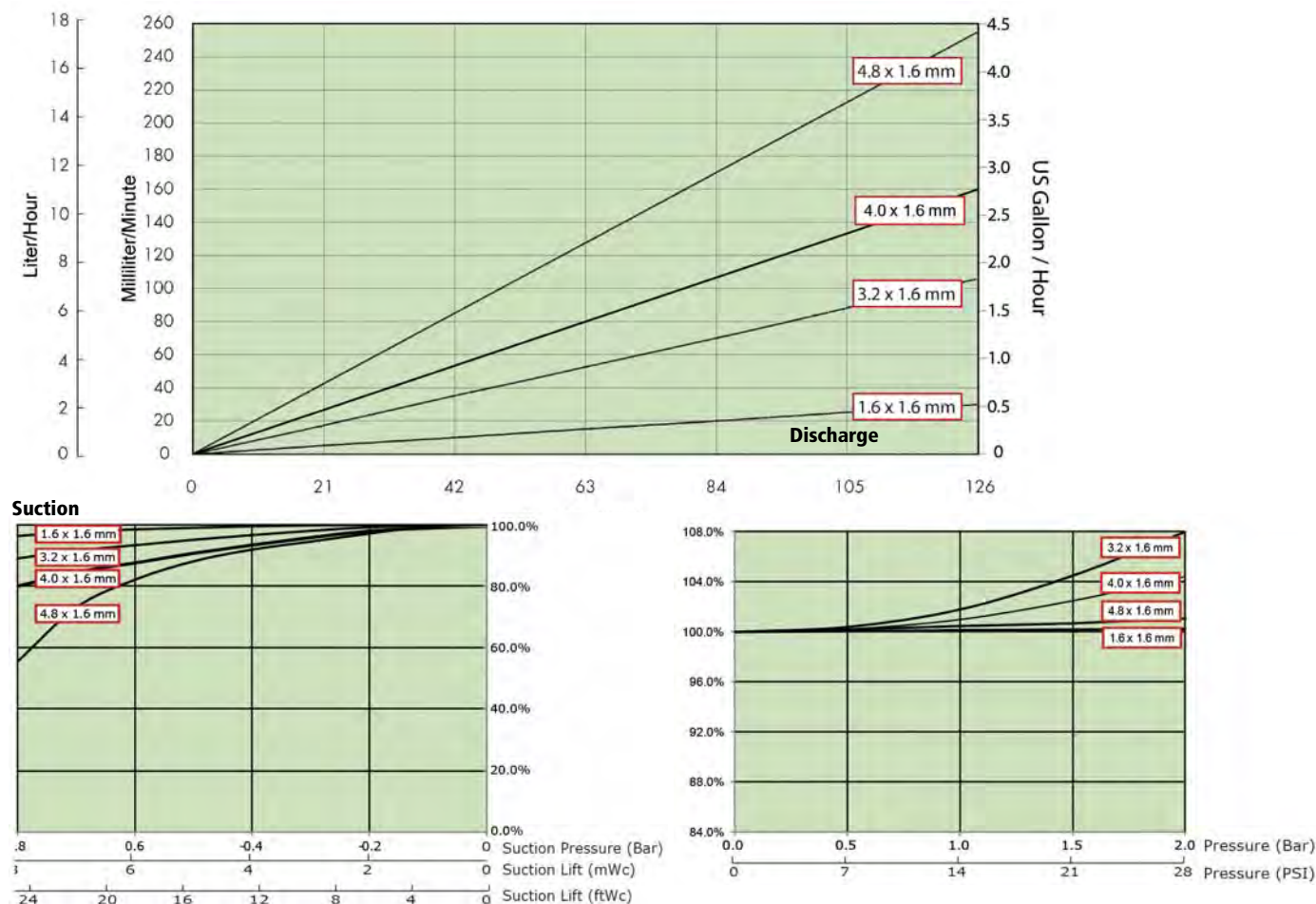
Tube: Silicone, Verderprene®; Polypropylene tube connectors provided

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

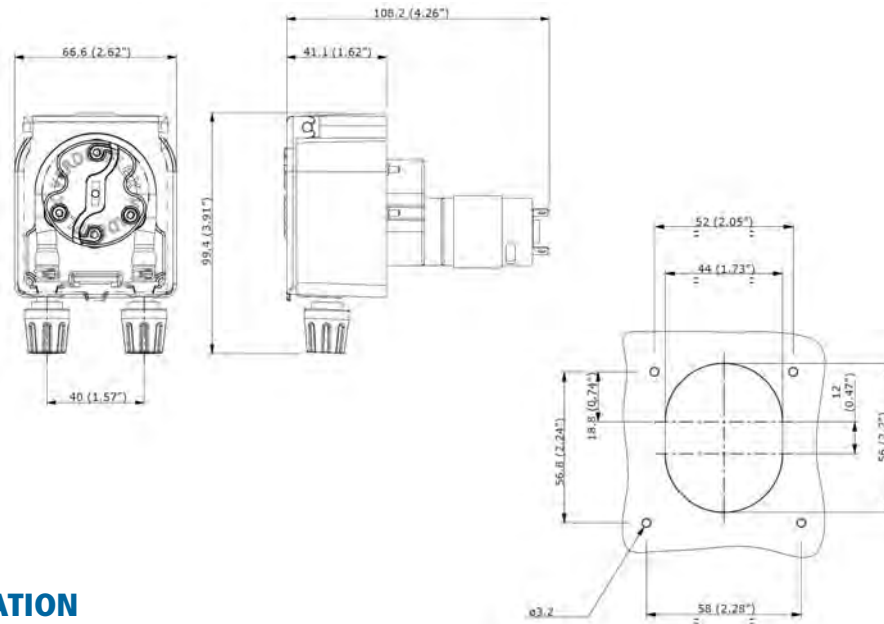
Weight: 0.4 kgs (0.9 lb)



Free Flow Curve



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)

Verder

Steptronic Mini-Load Peristaltic Pump

Flow Rate to 380 ml/min, Stepper Motor Drive

DESCRIPTION

The Steptronic Mini-Load is a cost effective single source solution giving all users from design engineers to large OEM manufactures maximized performance and reliability. Steptronic Mini-Load reduces downtime and eliminates the design uncertainty and risks associated with the separate specification of pumps, drives and control systems.

FEATURES

- Quick release, compact tube head
- 4000:1 turn down
- 0.1% speed accuracy
- Programmable speed range
- Built in electronic controller

SPECIFICATIONS

GENERAL

Pump Head: Acetal & Glass Filled Nylon (One or Two head options available)

Motor: High resolution, 12 bit stepper drive, 12-36V range DC 20W
Variable Speed - 0.001 to 409.6 RPM

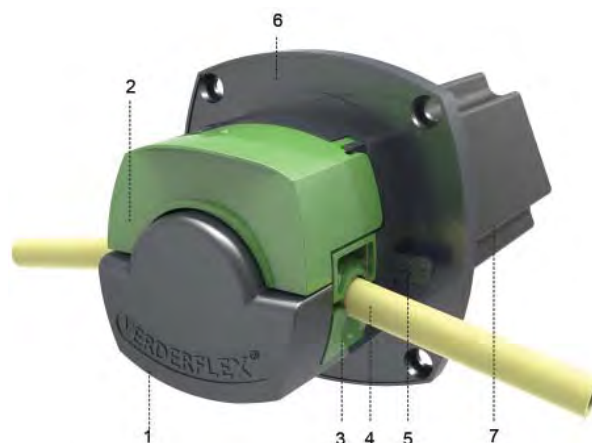
Analog Flow Control: 0-10Vdc (13Vdc Max), scaleable 4-20mA (27mA Max)

Rotor: 4 Roller

Tube: Verderprene, Silicone, Viton® and Tygon®

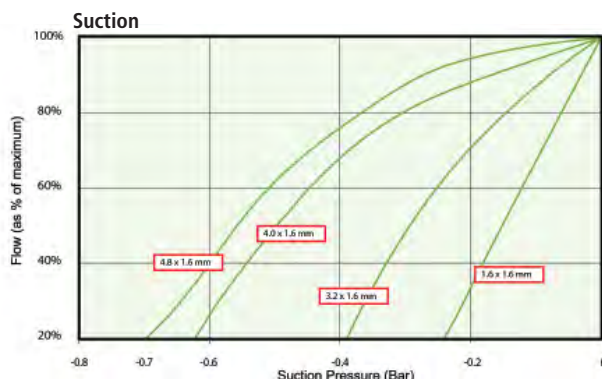
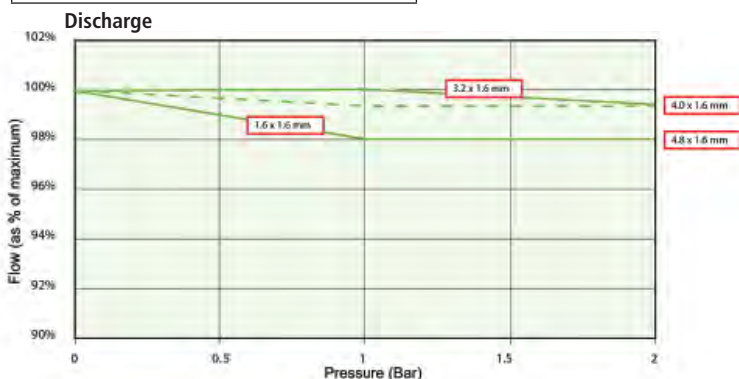
Tube Sizes: 1.6 x 1.6mm, 3.2 x 1.6mm, 4.0 x 1.6mm, 4.8 x 1.6mm; Tube clamps for the different tube sizes included

Weight: 1.89 kg (Cased Option - 2.65 kg)

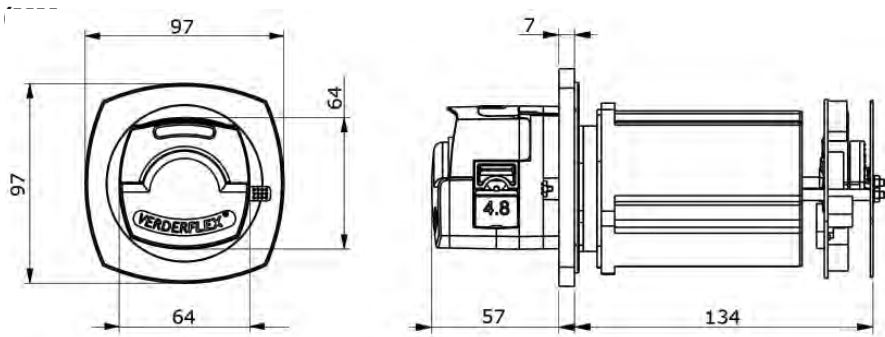


1	Front Cover
2	Tube Saddle
3	Tube Clamp Assembly
4	Tube Element
5	Pump-head Release Lever
6	Back Plate
7	Stepper Motor

Typical Flow Rates		
Tube (ID x Wall)	RPM	*Flow (ml/min)
1.6 x 1.6 mm	0-400	0-72
3.2 x 1.6 mm	0-400	0-232
4.0 x 1.6 mm	0-400	0-328
4.8 x 1.6 mm	0-400	0-380
*Flows measured with water at 20°C with no suction lift or discharge pressure		

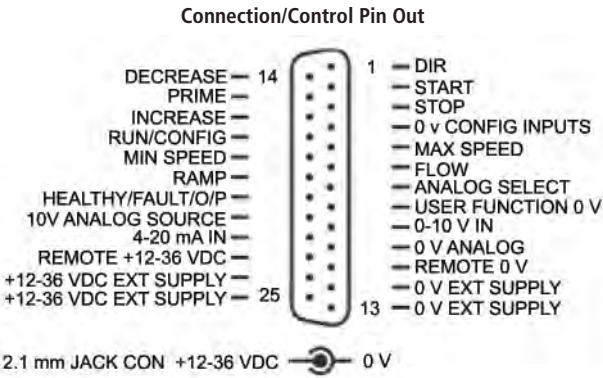


DIMENSIONS



WIRING

PIN	Description	PIN	Description
1	Direction	14	Speed Decrease
2	Start	15	Fast Prime
3	Stop	16	Speed Increase
4	0 V Config Inputs	17	Select Run/Config. Mode
5	Config. Max. Speed	18	Config. Min. Speed
6	Flow Scaling Select	19	Config. RAMP Speed
7	Analog Select (0-10 V or 4-20 mA)	20	Healthy/Fault Indicator
8	User Function 0 V	21	10 V analog Source
9	0-10 V In	22	4-20 mA In
10	0 V analog	23	Remote Power 12-36 V
11	Remote Power Return (0 V)	24	12-36 VDC Ext. Supply
12	0 V EXT Supply (Earth)	25	12-36 VDC Ext. Supply
12	0 V EXT Supply (Earth)		



STEPTRONIC MINI-LOAD CASED VERSION



1	Front Cover
2	Tube Saddle
3	Tube Clamp Assembly
4	Tube Element
5	Pump-head Release Lever
6	Back Plate
7	Pump Body
8	25 way D-sub
9	Power Socket
10	Earth Connector

ORDERING INFORMATION

Model Number	Description	Model Number	Description
162.1000	Steptronic Mini-Load Pump	AU T0016 SAT 07	5 Meters Verderprene 1.6 mm ID x 1/16 mm WT Tubing
162.1009	Cased Steptronic Mini-Load Pump	AU T0016 SAT 08	5 Meters Verderprene 3.2 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 12	5 Meters Silicone 1.6 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 13/55	5 Meters Verderprene 4.0 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 16	5 Meters Silicone 3.2 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 01	5 Meters Verderprene 4.8 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 01	5 Meters Silicone 4.0 mm ID x 1/16 mm WT Tubing	Contact us for additional tubing options	
AU T0016 SLT 02	5 Meters Silicone 4.8 mm ID x 1/16 mm WT Tubing		

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)

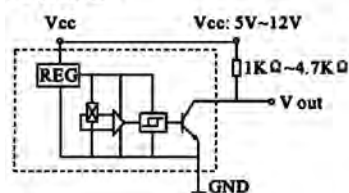
Tube Materials: Silicone, Neoprene G, PHI or ED-Plex

Weight: 402g

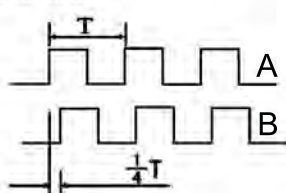
Options: Back shaft motor encoder, 10 pulses per motor revolution (consider gearbox ratio for pulses per pump rotor revolution)

BACK SHAFT ENCODER

Output Circuit



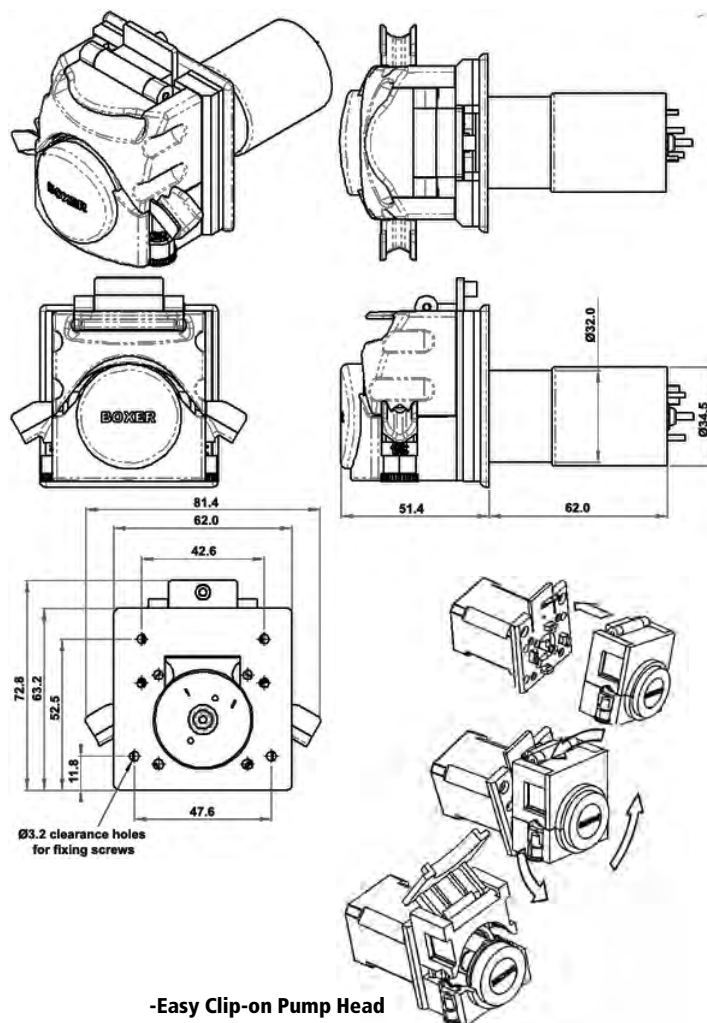
Output Wave



Shaft Encoder Pin Assignments

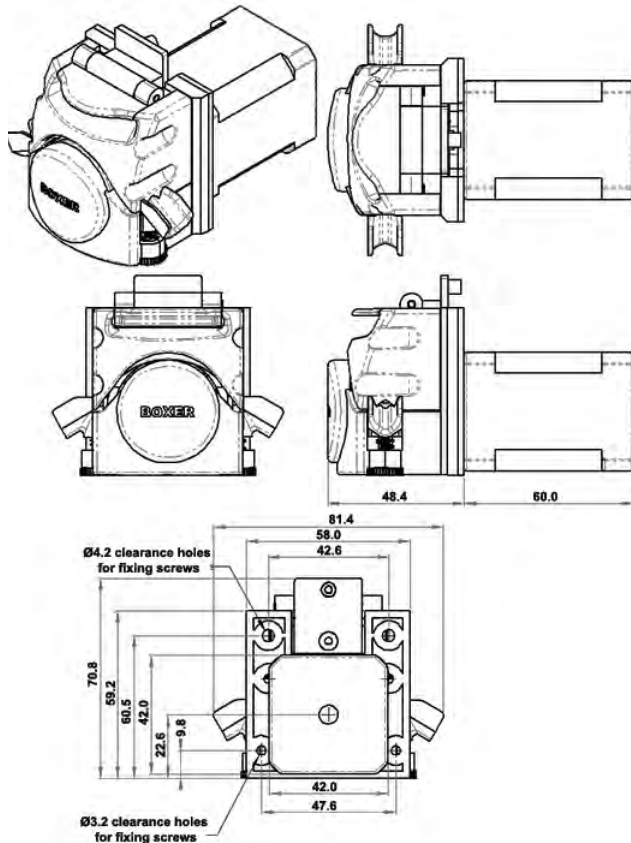
Motor	-	Hall Sensor	Gnd
Motor	+	Hall Sensor A	V out
Hall Sensor	Vcc	Hall Sensor B	V out

DIMENSIONS (MM) WITH DC MOTOR



-Easy Clip-on Pump Head
-Easy Tube Loading

DIMENSIONS (MM) WITH STEPPER MOTOR



ORDERING INFORMATION

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

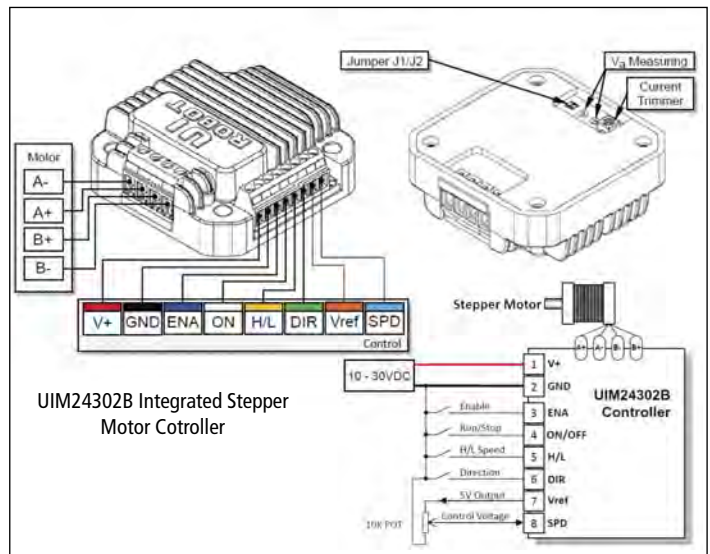
15KS Models	15QQ Models	*Number of Rollers	Nom. Voltage (VDC)	RPM
Pump Head, DC Motor & Gearbox				
15011.100	15011.900	4	12	312
15012.100	15012.900	4	12	437
15013.100	15013.900	4	24	298
15014.100	15014.900	4	24	420
Pump Head & Stepper Motor				
15602.100	15602.900	4	24	max. 800
**15652.101	**15652.901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

NEMA 23 STEPPER MOTOR CONTROLLERS

ROTATIONAL SPEEDS TO 780 RPM



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.

UIM24302B 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.

UIM24302B 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.

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 Controller

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

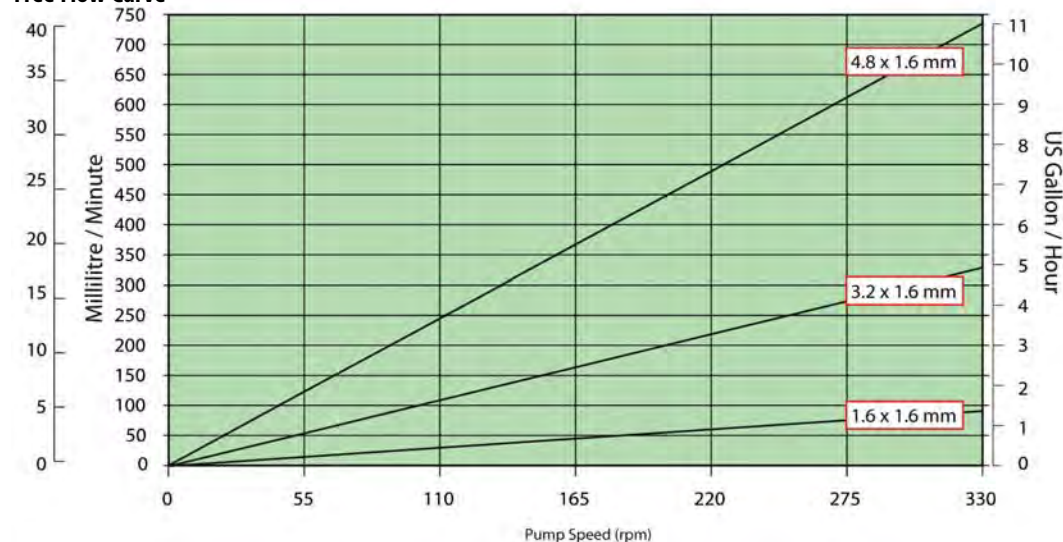
Tube: Silicone, Verderprene®, call for other tubing;

Polypropylene tube connectors provided

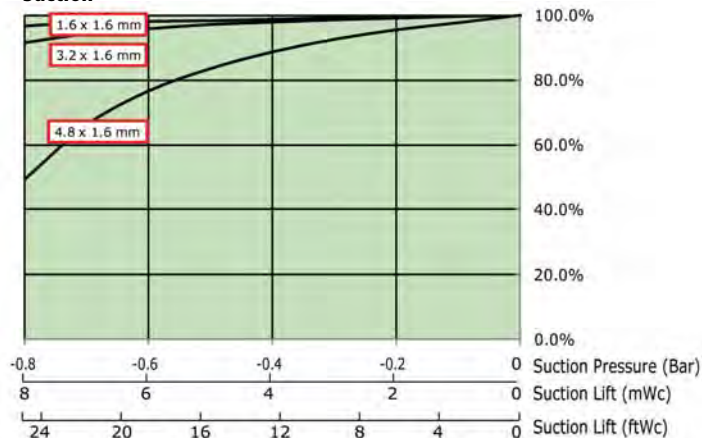
Tube Sizes (I.D x Wall Thickness): 1.6 mm x 1.6 mm,
3.2 x 1.6 mm, 4.8 x 1.6 mm



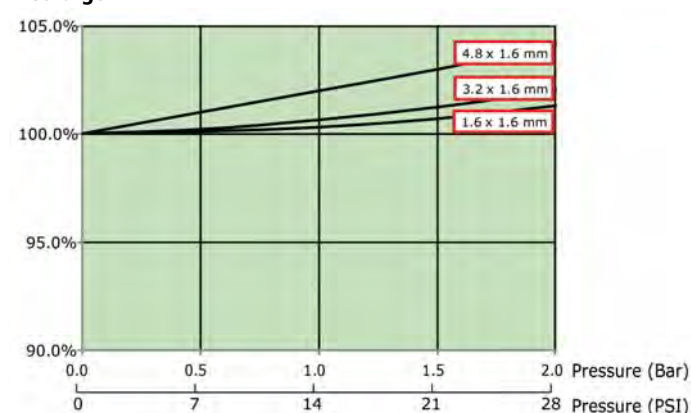
Free Flow Curve



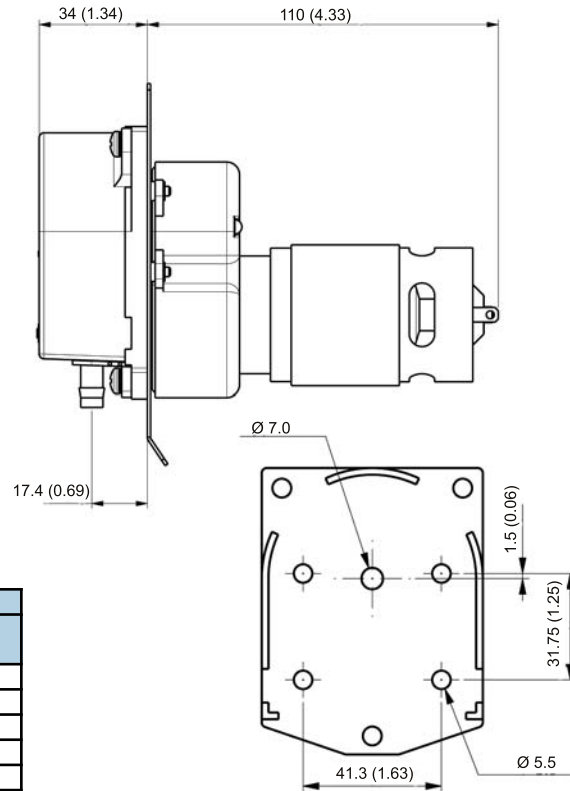
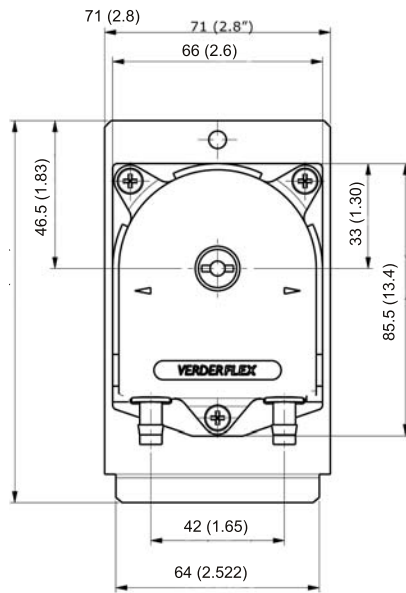
Suction



Discharge



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
			4.8 mm	AU M550082 02
	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
			4.8 mm	AU M550082 02
125	12V DC	VERDERPRENE	3.2 mm	AU M530125 09
			4.8 mm	AU M550125 52
			4.8 mm	AU M550125 52
		SILICONE	3.2 mm	AU M530125 22
			4.8 mm	AU M550125 58
			4.8 mm	AU M550125 58
	24V DC	VERDERPRENE	3.2 mm	AU M530125 11
			4.8 mm	AU M550125 05
			4.8 mm	AU M550125 05
		SILICONE	3.2 mm	AU M530125 05
			4.8 mm	AU M550125 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
			4.8 mm	AU M550176 31
		SILICONE	4.8 mm	AU M550176 31
			4.8 mm	AU M550176 03
			4.8 mm	AU M550176 04
	24V DC	VERDERPRENE	3.2 mm	AU M530176 10
			4.8 mm	AU M550176 30
			4.8 mm	AU M550176 30
		SILICONE	3.2 mm	AU M530176 10
			4.8 mm	AU M550176 30
			4.8 mm	AU M550176 30
240	12V DC	VERDERPRENE	4.8 mm	AU M550240 06
		SILICONE	4.8 mm	AU M550240 07
		SILICONE	4.8 mm	AU M550240 07
	24V DC	VERDERPRENE	4.8 mm	AU M550240 03
		SILICONE	4.8 mm	AU M550240 08
		SILICONE	4.8 mm	AU M550240 08
325	12V DC	VERDERPRENE	4.8 mm	AU M550325 07
		SILICONE	4.8 mm	AU M550325 17
		SILICONE	4.8 mm	AU M550325 17
	24V DC	VERDERPRENE	4.8 mm	AU M550325 13
		SILICONE	4.8 mm	AU M550325 18
		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)

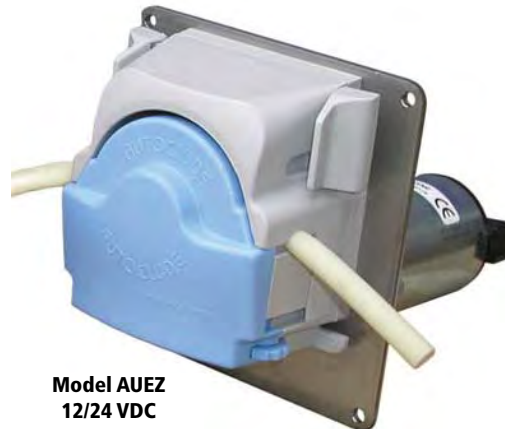
DESCRIPTION

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

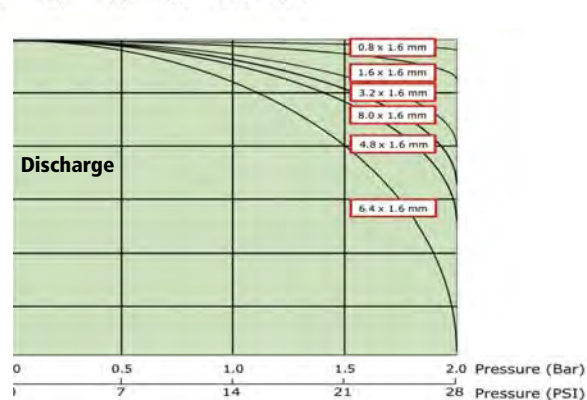
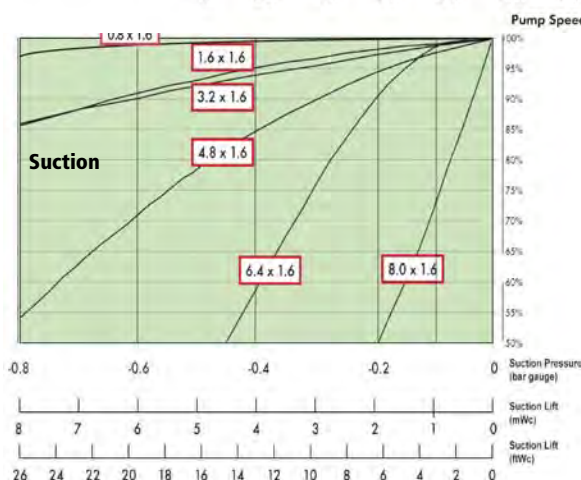
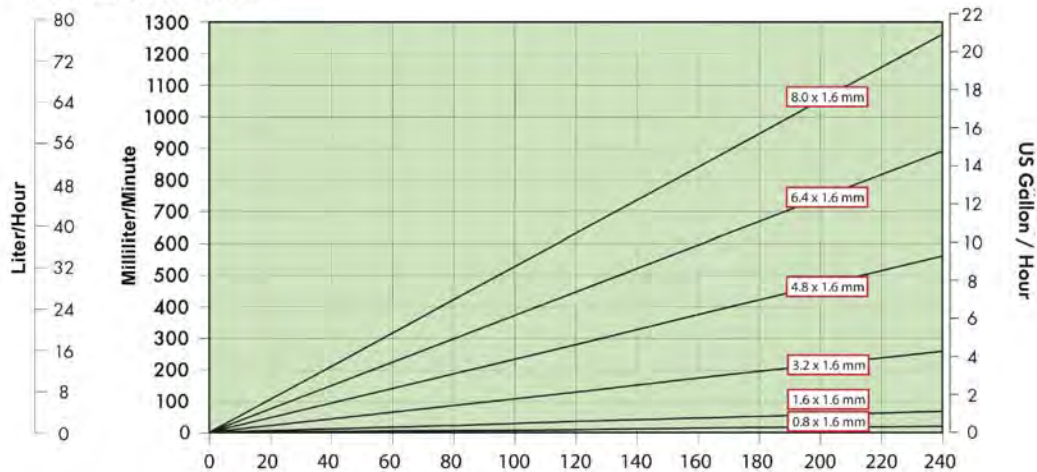
Options: 3-roller

Tube: Silicone, Verderprene®, Tygon, Viton

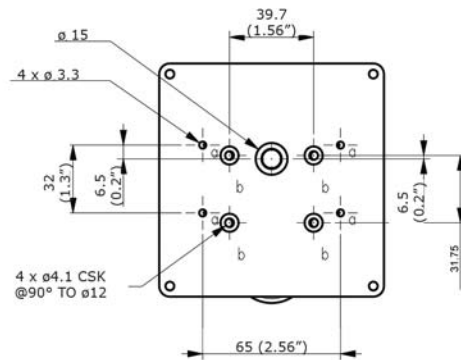
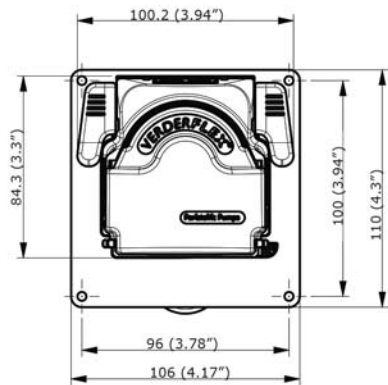
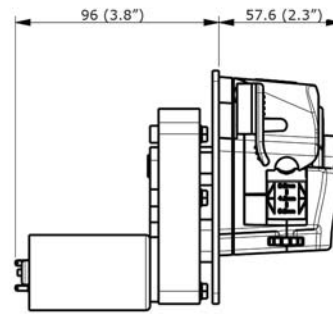
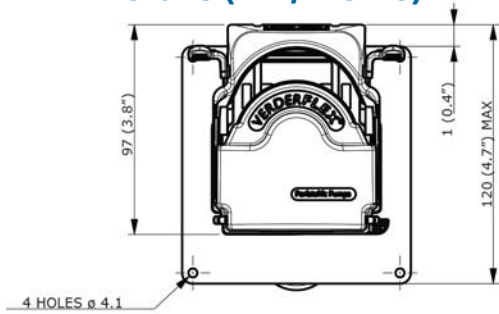
Tube Sizes (I.D x Wall Thickness): .08 x 1.6 mm, 1.6 x 1.6 mm, 3.2 x 1.6 mm, 4.8 x 1.6 mm, 6.4 x 1.6 mm and 8.0 x 1.6 mm

Weight: 1.3 kgs (2.9 lb)

EZ Free Flow Curve



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
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.

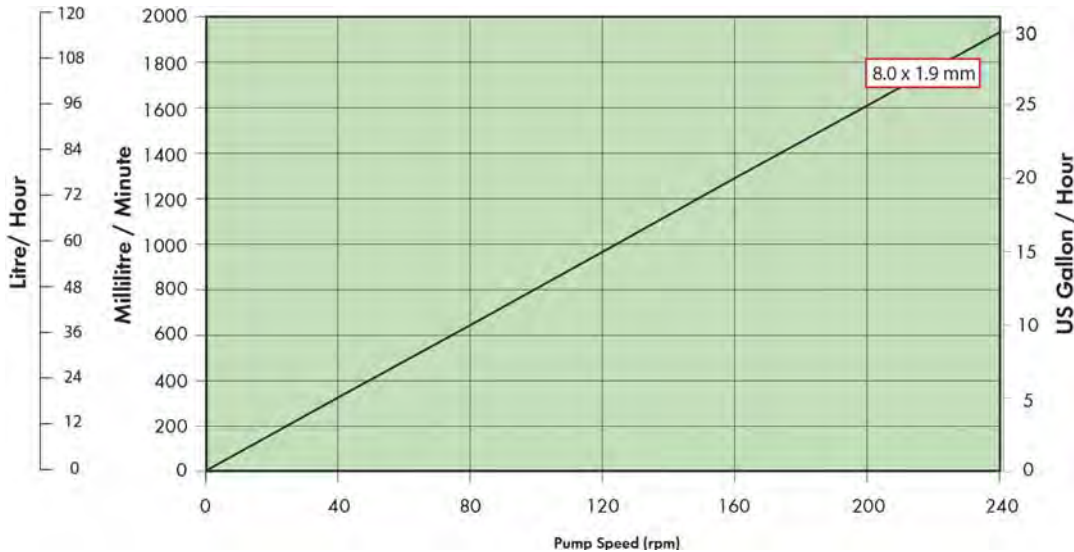


SPECIFICATIONS

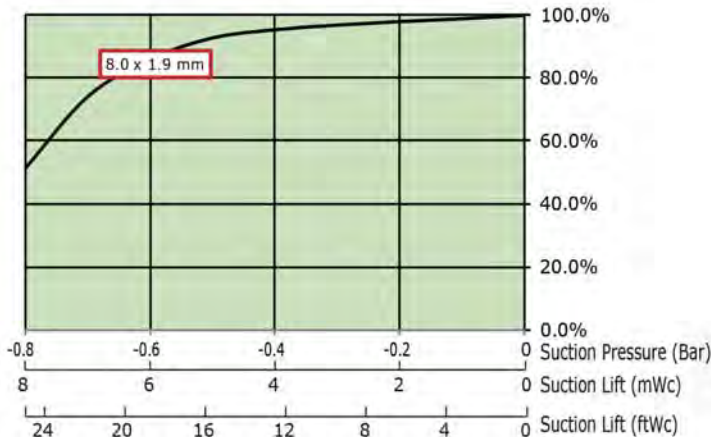
Pump Head: Black polycarbonate with support bearing and mounting plate
Rotor: Polycarbonate, 316 stainless steel inserts with Nylatron® rollers
Motor: 24V D.C., 30W

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



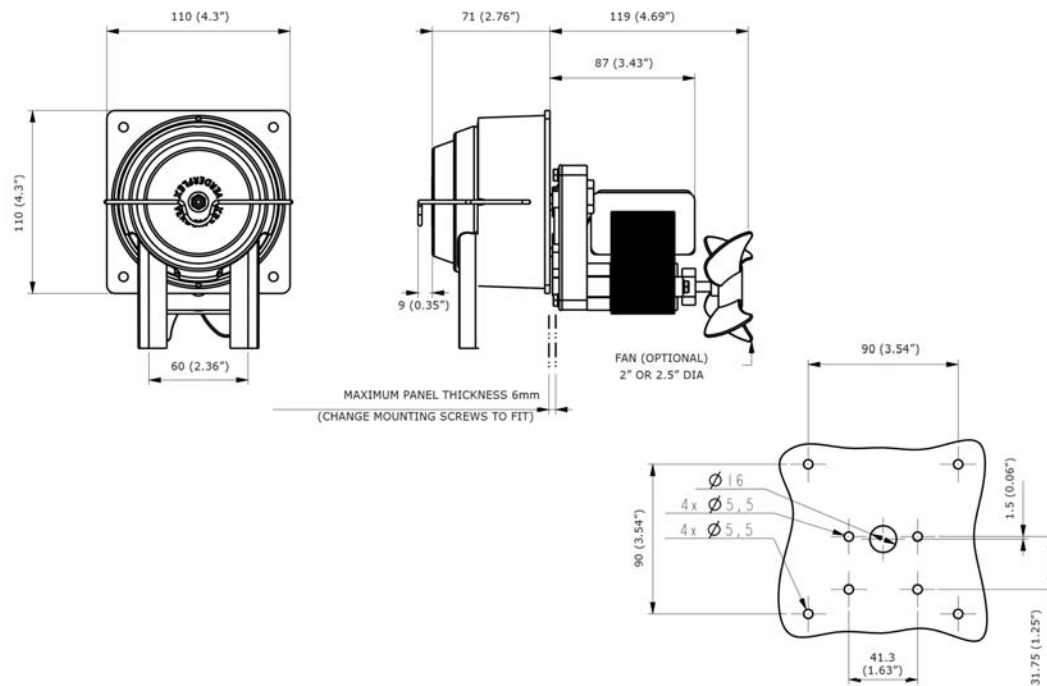
Suction



Discharge



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

Steptronic EZ Head Peristaltic Pump

Flow Rate to 1310 ml/min, Stepper Motor Drive

DESCRIPTION

The Steptronic EZ Head is a cost effective single source solution giving all users from design engineers to large OEM manufactures maximized performance and reliability. Steptronic EZ Head reduces downtime and eliminates the design uncertainty and risks associated with the separate specification of pumps, drives and control systems.

FEATURES

- Quick release, compact tube head
- 4000:1 turn down
- 0.1% speed accuracy
- Programmable speed range
- Built in electronic controller

SPECIFICATIONS

GENERAL

Pump Head: Polyamide (One pump head standard, two pump head option available)

Motor: High resolution, 12 bit stepper drive, 12-36V range DC 20W
Variable Speed - 0.001 to 250 RPM

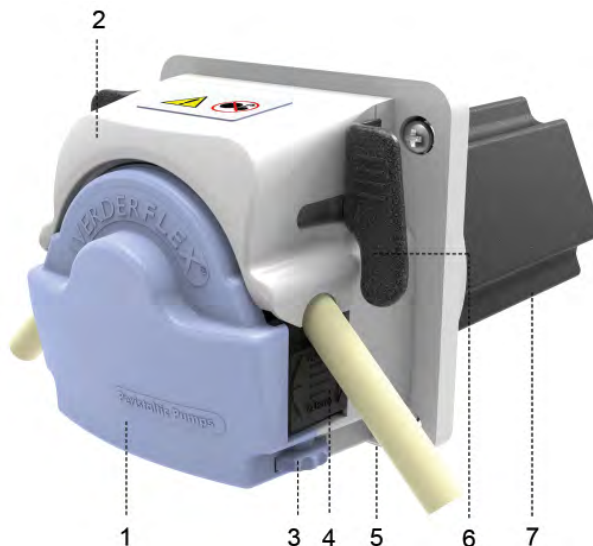
Analog Flow Control: 0-10Vdc (13Vdc Max), scaleable 4-20mA (27mA Max)

Rotor: 3 Roller

Tube: Verderprene, Silicone, Viton® and Tygon®

Tube Sizes: 0.8 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, 8.0 x 1.6 mm; Tube clamps for the different tube sizes included

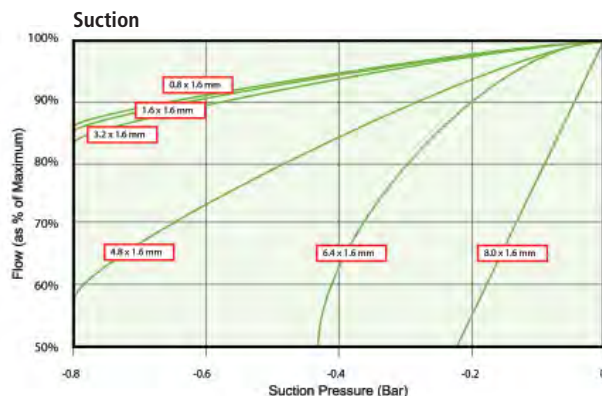
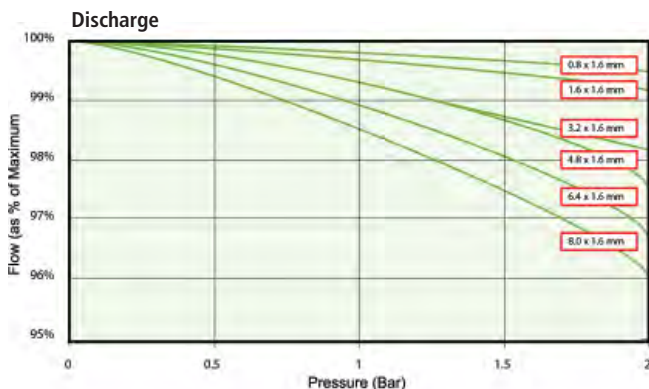
Weight: 2.0 kg (Cased Option - 2.73 kg)



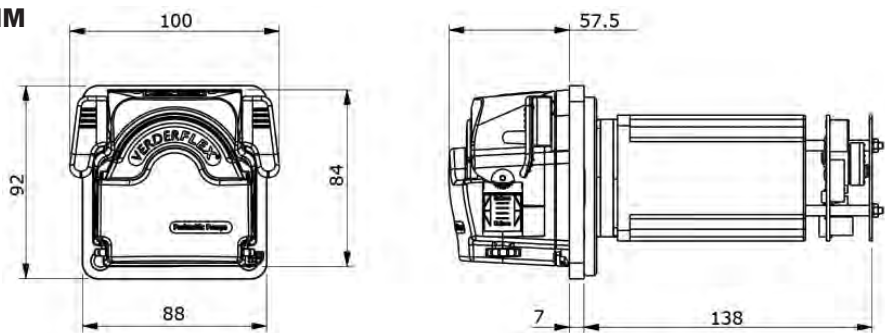
1	Front Cover
2	Tube Saddle
3	Variable Tube Clamp
4	Tube Clamp Assembly
5	Pump-head Release Lever
6	Lugs
7	Stepper Motor

Typical Flow Rates		
Tube (ID x Wall)	RPM	*Flow (ml/min)
0.8 x 1.6 mm	0-250	0-19
1.6 x 1.6 mm	0-250	0-70
3.2 x 1.6 mm	0-250	0-268
4.8 x 1.6 mm	0-250	0-588
6.4 x 1.6 mm	0-250	0-938
8.0 x 1.6 mm	0-250	0-1310

*Flows measured with water at 20°C with no suction lift or discharge pressure

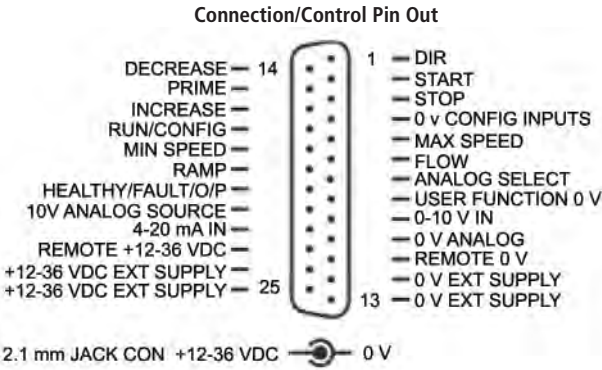


DIMENSIONS (MM)

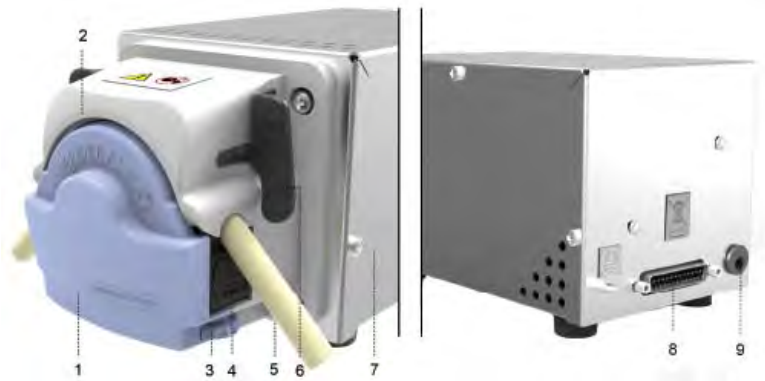


WIRING

PIN	Description	PIN	Description
1	Direction	14	Speed Decrease
2	Start	15	Fast Prime
3	Stop	16	Speed Increase
4	0 V Config Inputs	17	Select Run/Config. Mode
5	Config. Max. Speed	18	Config. Min. Speed
6	Flow Scaling Select	19	Config. RAMP Speed
7	Analog Select (0-10 V or 4-20 mA)	20	Healthy/Fault Indicator
8	User Function 0 V	21	10 V analog Source
9	0-10 V In	22	4-20 mA In
10	0 V analog	23	Remote Power 12-36 V
11	Remote Power Return (0 V)	24	12-36 VDC Ext. Supply
12	0 V EXT Supply (Earth)	25	12-36 VDC Ext. Supply
12	0 V EXT Supply (Earth)		



STEPTRONIC EZ HEAD CASED VERSION



1	Front Cover
2	Tube Saddle
3	Variable Tube Clamp
4	Tube Clamp Assembly
5	Pump-head Release Lever
6	Lugs
7	Pump Body
8	25 way D-sub
9	Power Socket
10	Earth Connector

ORDERING INFORMATION

Model Number	Description	Model Number	Description
162.1001	Steptronic EZ Head Pump	AU T0016 SAT 24	5 Meters Verderprene 0.8 mm ID x 1/16 mm WT Tubing
162.1043	Cased Steptronic EZ Head Pump	AU T0016 SAT 07	5 Meters Verderprene 1.6 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 25	5 Meters Silicone 0.8 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 08	5 Meters Verderprene 3.2 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 12	5 Meters Silicone 1.6 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 01	5 Meters Verderprene 4.8 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 16	5 Meters Silicone 3.2 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 03	5 Meters Verderprene 6.4 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 02	5 Meters Silicone 4.8 mm ID x 1/16 mm WT Tubing	AU T0016 SAT 04	5 Meters Verderprene 8.0 mm ID x 1/16 mm WT Tubing
AU T0016 SLT 03	5 Meters Silicone 6.4 mm ID x 1/16 mm WT Tubing		
AU T0016 SLT 04	5 Meters Silicone 8.0 mm ID x 1/16 mm WT Tubing		Contact us for additional tubing options

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 cycloloy 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

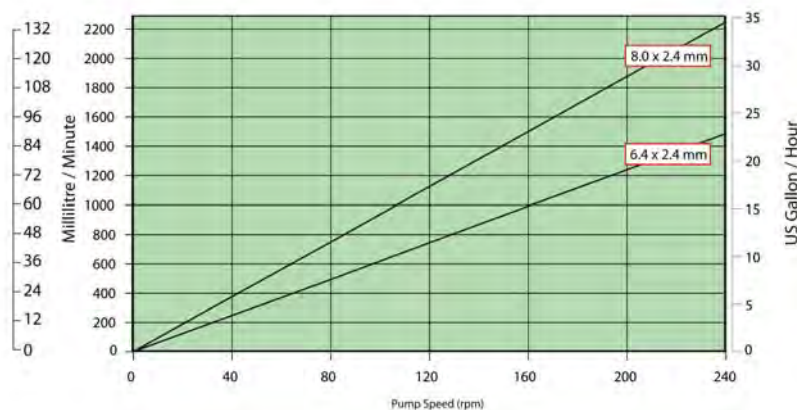
Tube: Thick wall (2.4 mm) round sections Silicone & Verderprene, 6.4 mm and 8 mm I.D.;

Polypropylene tube connectors provided.

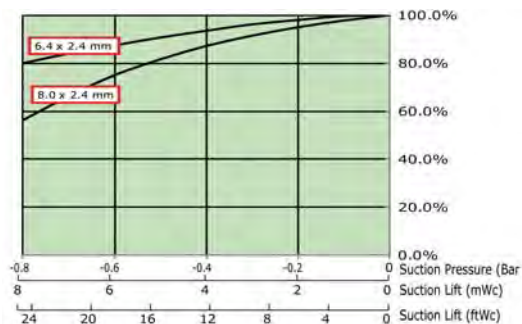
Weight: 1.8 kgs (4.0 lb)



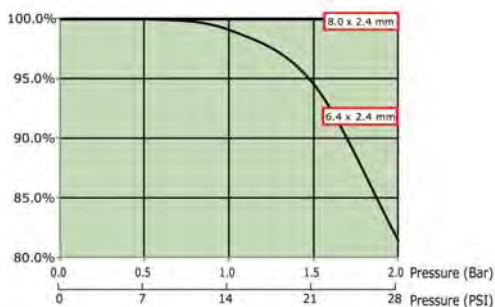
Free Flow Curve



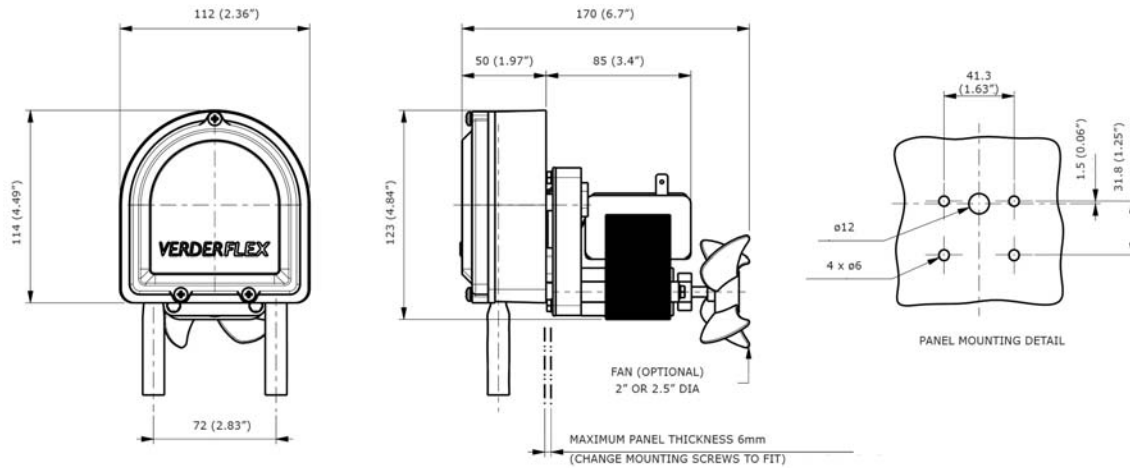
Suction



Discharge



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 various 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

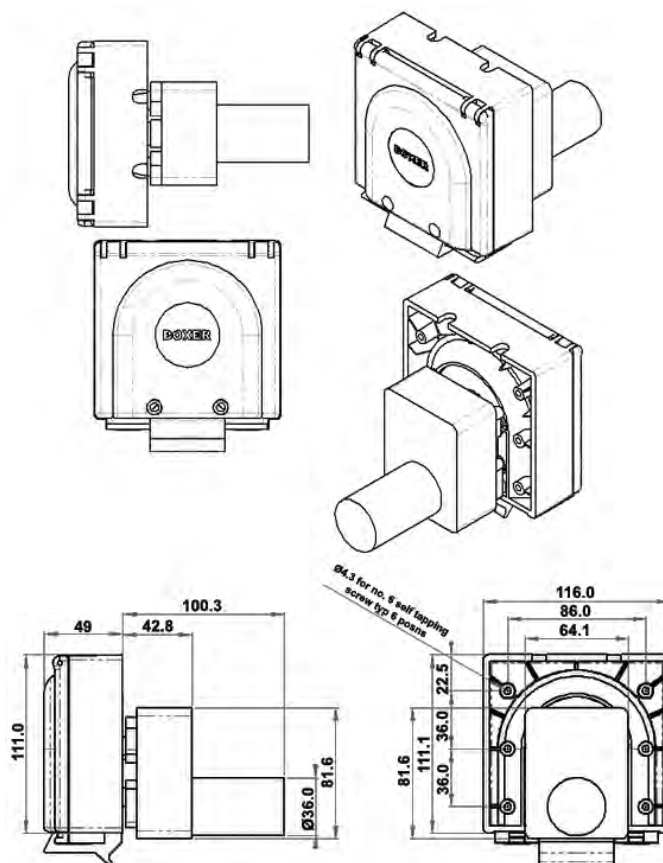
RPM: 280 RPM at nominal voltage

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

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

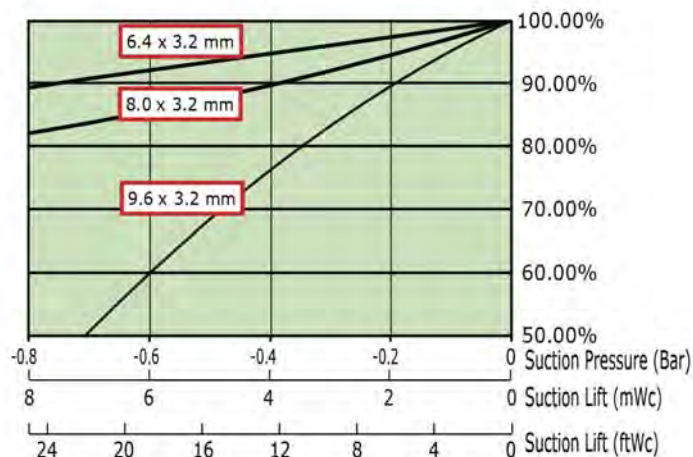
Tube Sizes (I.D x Wall Thickness): 6.4 x 3.2mm, 8.0 x 3.2mm and 9.6 x 3.2mm
Weight: 1.75 kg (3.9 lb)

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

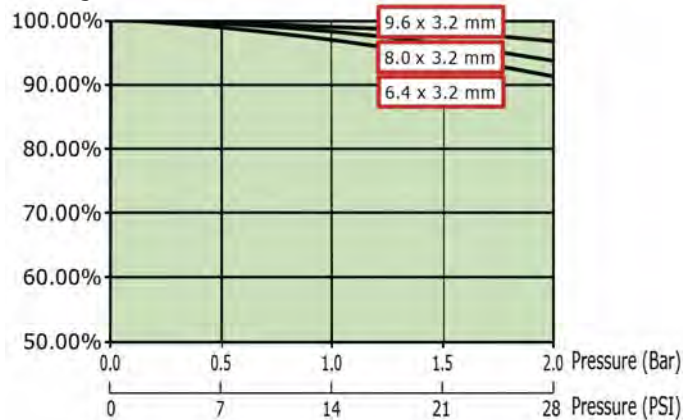
Spare Parts & Tube Sets	
Part Number	Description
AU E3212 ASSY	R3D HOUSING ASSY
AU E0197/B	R3D SHAFT ADAPTOR
AU E3215 ASSY	R3 FRONT COVER ASSY
AU E0690 04	R3DC STD 3R ROTOR ASSY
AU E3214 ASSY	R3 TUBE CLAMP ASSY
185.1035.P	PK 10 8/10 MM WHT ACETAL TUBE CONNECTORS
185.1034.P	PK 10 8/10MM BLACK PP TUBE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



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

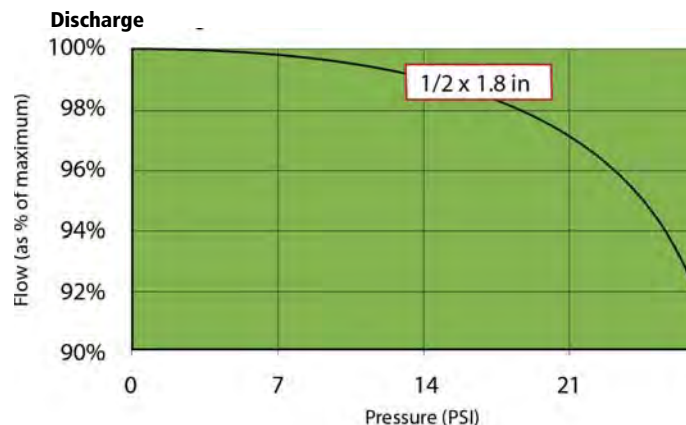
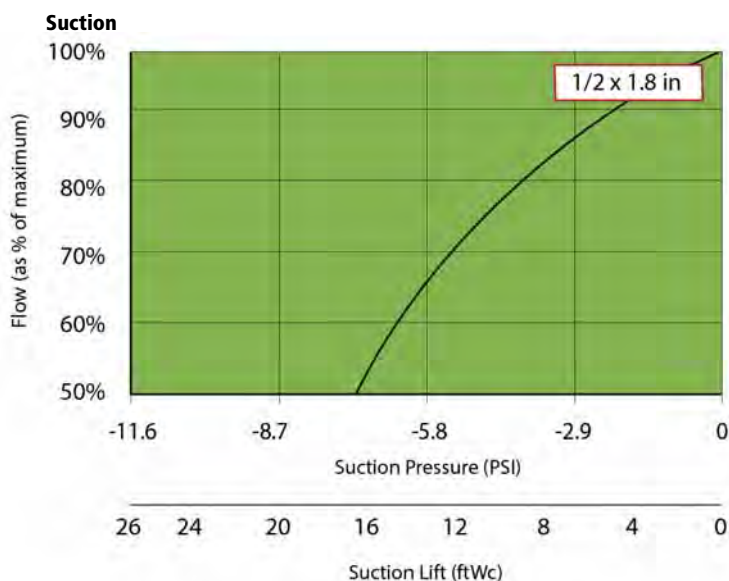
Tube Sizes (I.D x Wall Thickness): 1/2" x 1.8"

(12.7 x 3.2 mm)

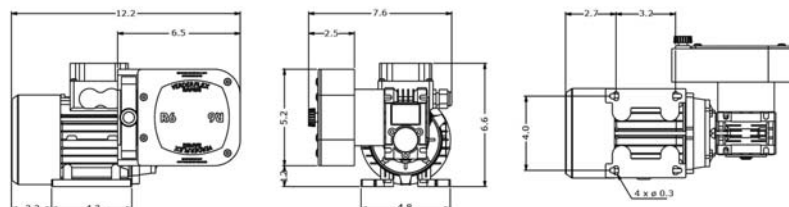
Weight: 14.3 lb

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



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"

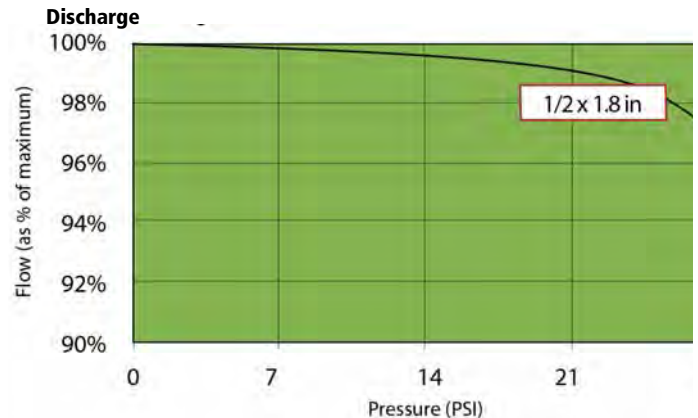
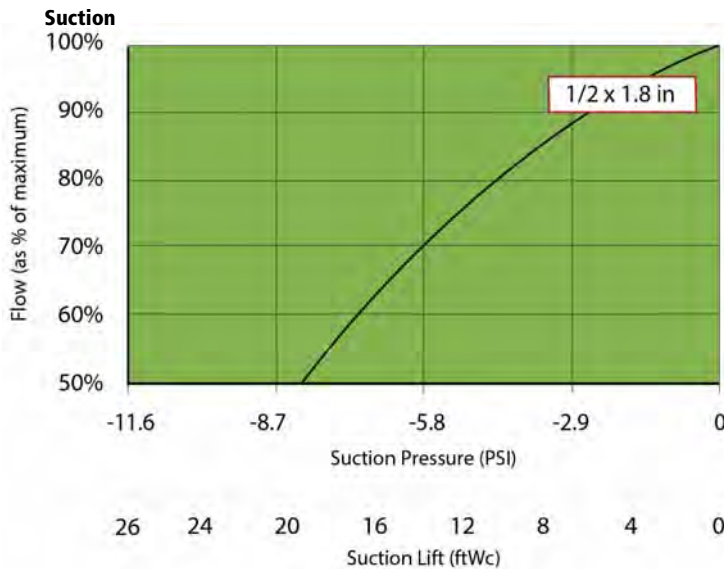
(12.7 x 3.2 mm)

Weight: 14.3 lb

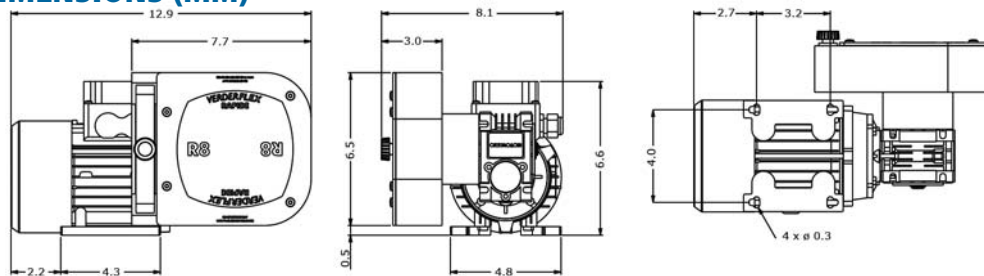


Model Selection							
Model No. w/Verderprene Tubing	Model No. w/Silicone Tubing	Tubing ID	Gear Box Ratio	Pump Speed (RPM)	Flow (GPH)	Flow (GPM)	Flow (L/Min)
AU M813068 08	AU M813068 09	1/2"	20:1	84	55.3	0.922	3.49
AU M813137 05	AU M813137 06	1/2"	10:1	167	89.5	1.79	6.78
AU M813196 13	AU M813196 14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



DIMENSIONS (MM)



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: 1/4 HP 60Hz

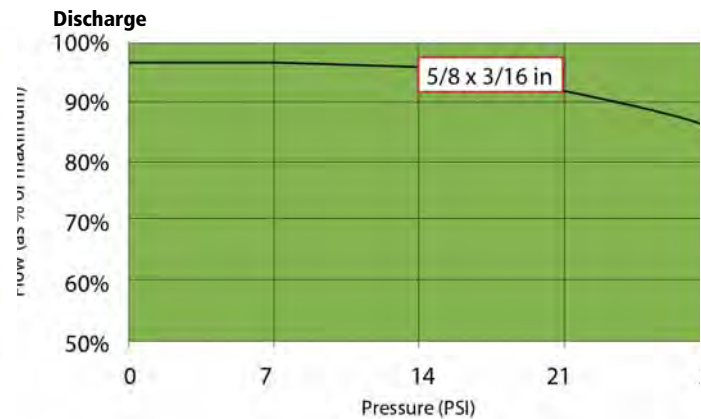
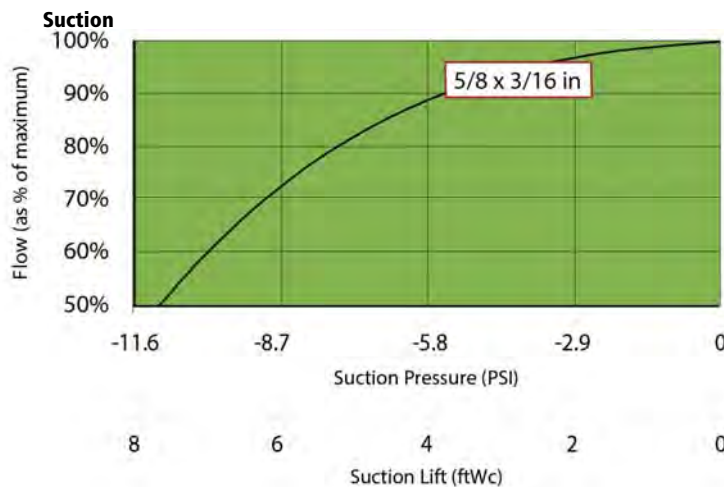
Tube: Verderprene or Silicone

Tube Sizes (I.D x Wall Thickness): 5/8" x 3/16"

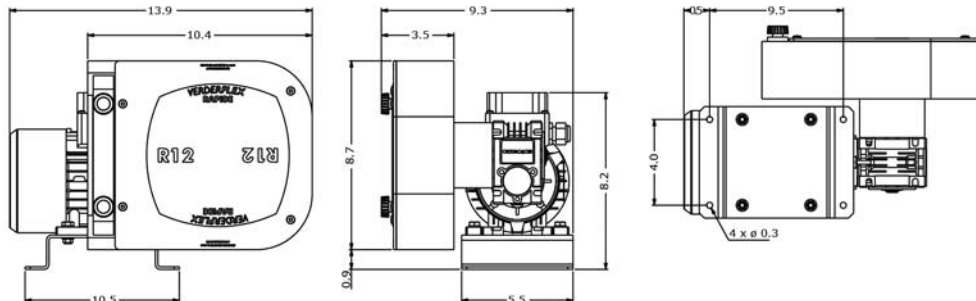
Weight: 26.5 lb

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



DIMENSIONS (MM, INCHES)



BOXER

9700 Bench Top Peristaltic Pump Dispensor

Variable Speed, Reversible, 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

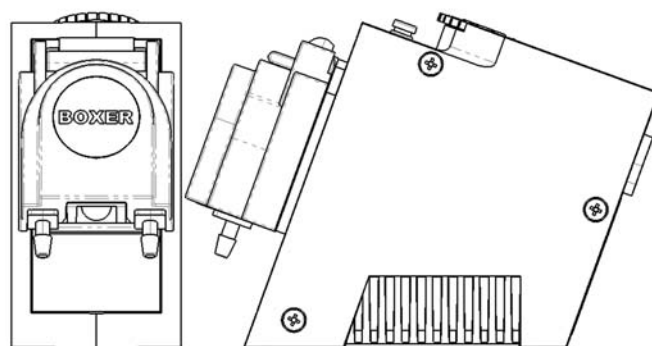
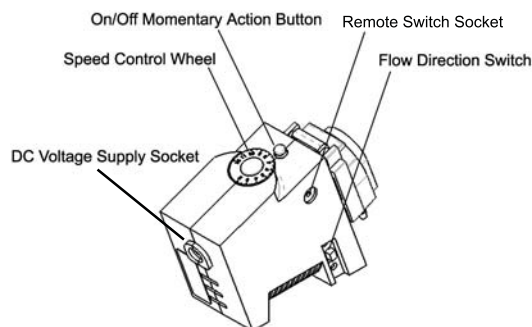
Flow Direction: Manual switch to reverse flow

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, Reversible, 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 economic 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)

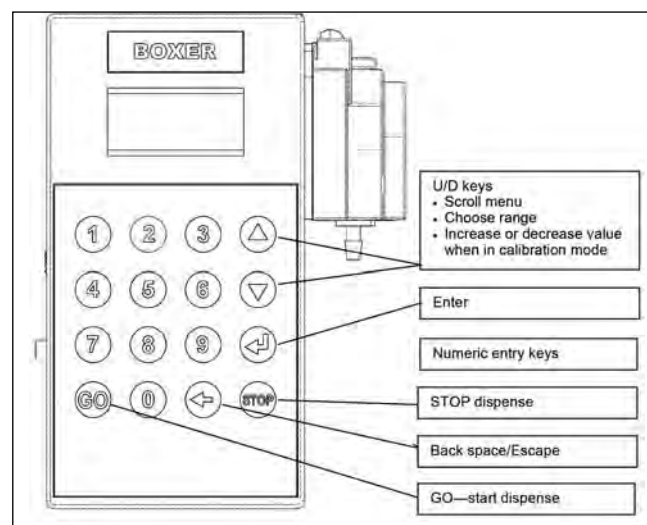
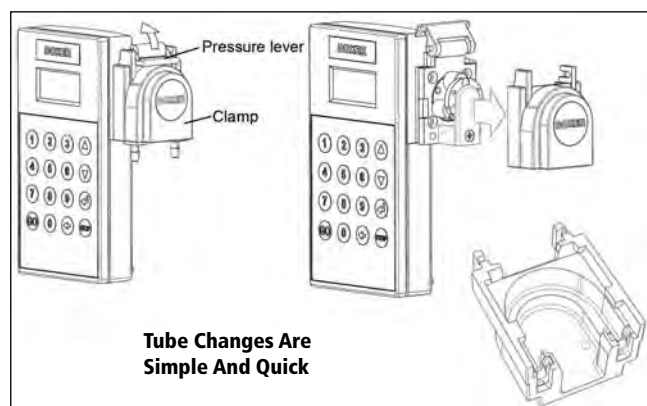
Max. Vacuum: -950mbar (28.1 inches Hg)

Operating Temperature Range: 10 to 40°C

Storage Temperature Range: 4 to 40°C

Operating Relative Humidity: 90%

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



BOXER

9200 Bench Top Peristaltic Pump Dispensor

Variable Speed, Reversible, 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 economic 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)

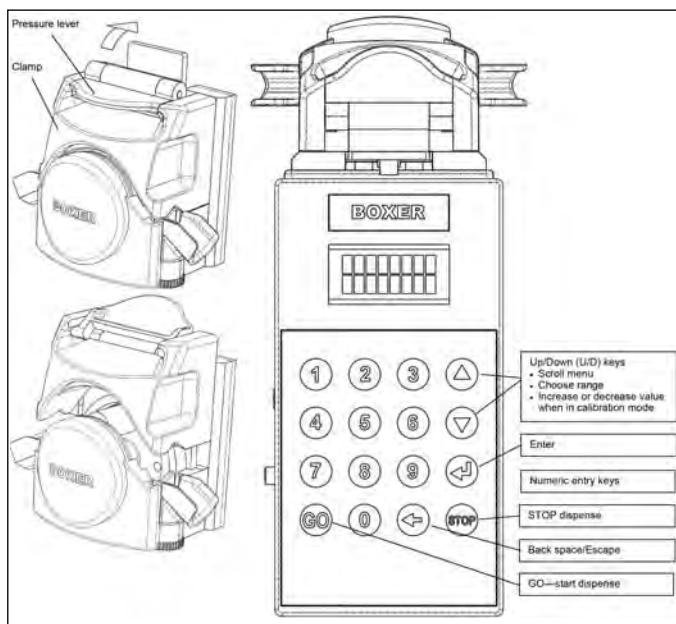
Max. Vacuum: -950mbar (28.1 inches Hg)

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

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.

PUMP SPECIFICATIONS

Pumphead: EV045, Black Cyclogy; 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



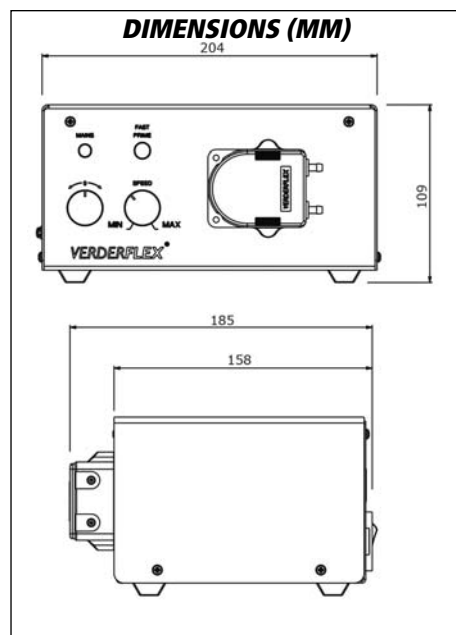
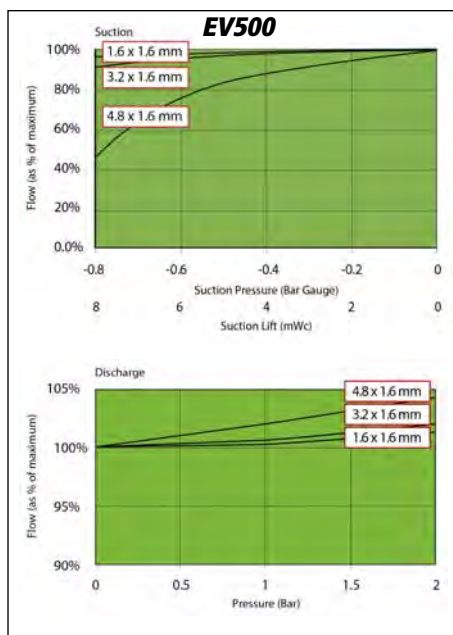
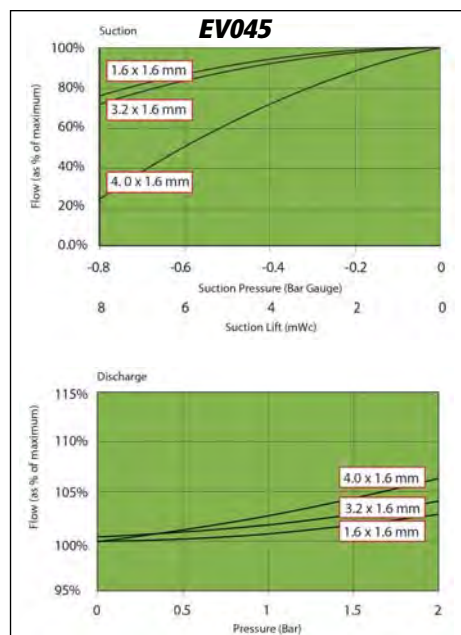
EV045



EV500

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



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.

PUMP SPECIFICATIONS

Pumphead: EV1500, Black Cyclogy; 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



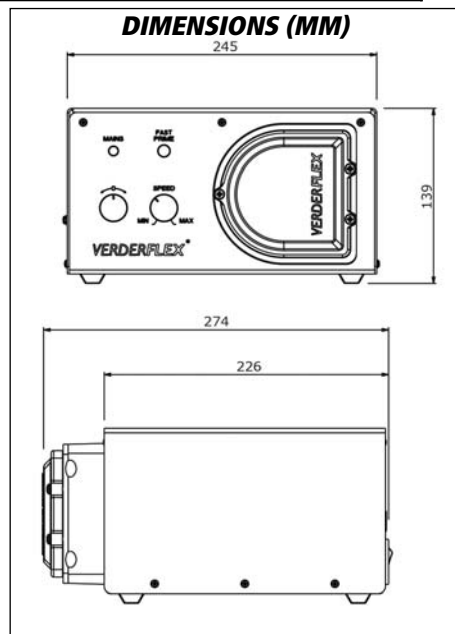
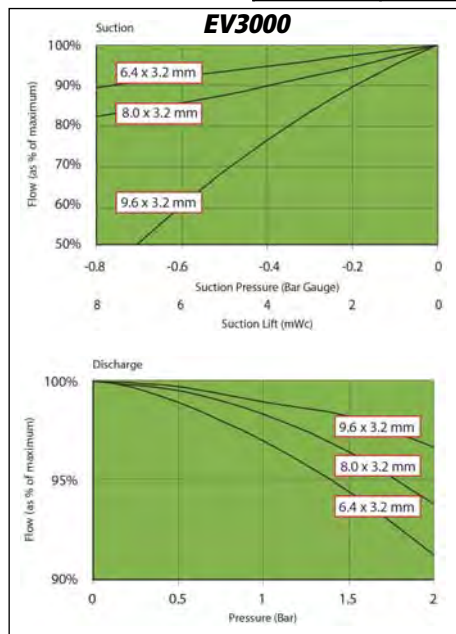
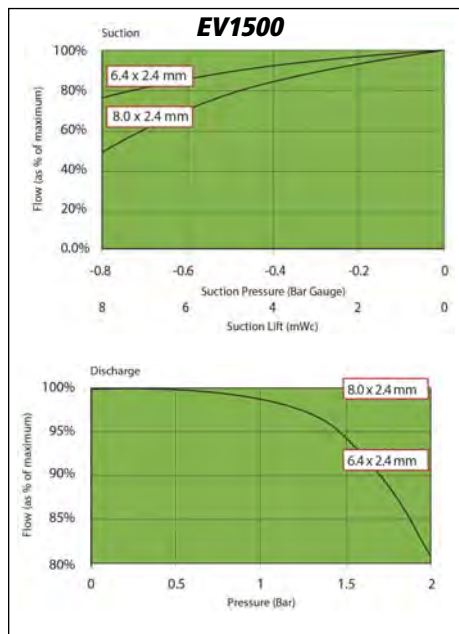
EV1500



EV3000

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



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

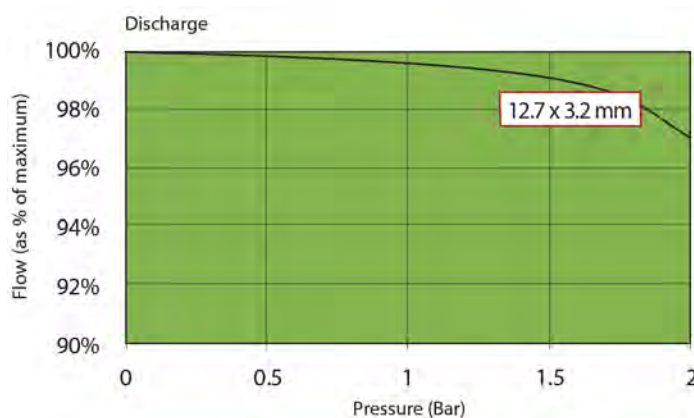
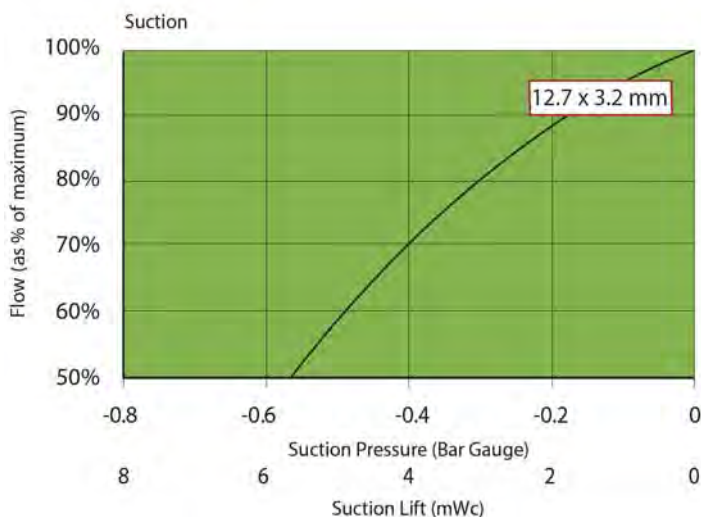
Weight: 8 kgs (17.6 lbs)

Dimensions: See Dimension Drawing

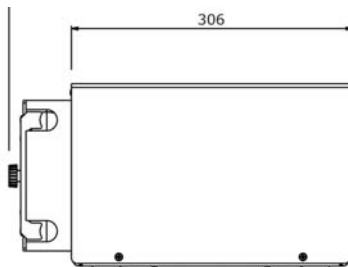
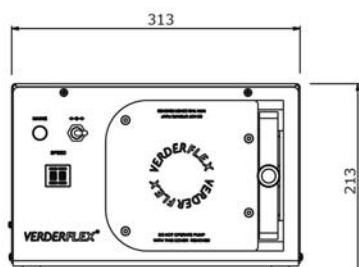
Enclosure: IP30, Epoxy Polyester Coating

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)



VERDER

Vantage 5000 Cased Peristaltic Dosing Pump

Flow Rate To 6800 ml/min (104.6 GPH)

DESCRIPTION

The Vantage 5000 cased drive peristaltic pump accurately doses liquids at pressures exceeding 100 PSI for industries ranging from the aseptic, pharmaceutical environment to the harsh requirements of water treatment and mining.

- Advanced touch screen controls
- Intuitive, easy to follow menus
- Large diameter rotor
- Maximum flow rate 104.6 GPH
- Precision stepper motor dosing 4096:1 speed control ratio
- USB interface for pump back-up and job transfer
- Many remote controls options: analog, digital & BUS control versions.



SPECIFICATIONS

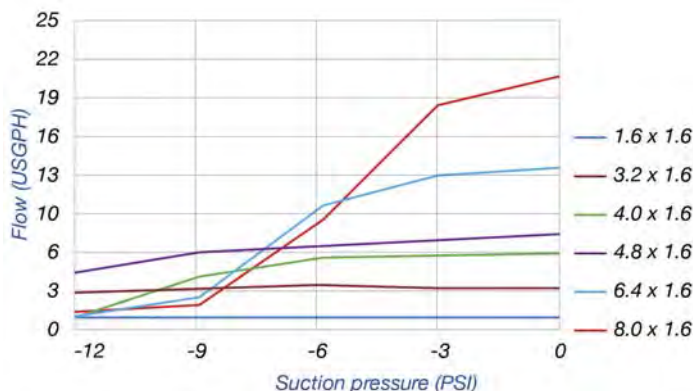
Max. flow rate: 6600 ml/min, 104.6 GPH
Maximum Pump Speed: 400 rpm
Max. discharge pressure: >7 Bar, > 100 PSI
Speed Control Ratio: 4096:1
Temperature: 41°F - 104°F
Ingress Rating: IP66 / NEMA 4X (washdown)
Power Supply: 85-265V 50/60Hz AC single phase with fuseless reset switch
Humidity (non-condensing): 10-100% RH
Torque Rating: 2.2Nm, continuous duty
Noise: <70dB (A) at 1m
Weight 26 lbs

MATERIALS

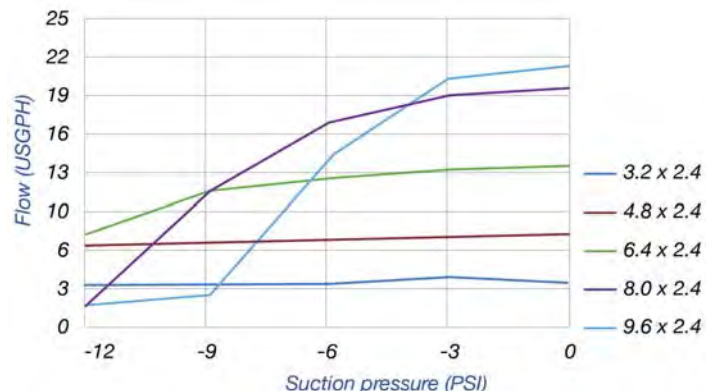
Casing: Gravity die-cast LM6 Aluminium, Achromed and powder coated

Continuous Tubing Clamps: Glass Filled Nylon
Display: High definition 4.33" TFT touch screen
Drive shaft: 304 Stainless steel with thermoplastic polyurethane (TPU) sleeve
Pump Head: PPS (polyphenylene sulphide) Rotor Body & Arms, 304 Stainless Steel Main rollers with 440C Stainless Steel Bearings, Nylon guide rollers.
Bearing Strut : Bulk Moulding Compound (BMC) - glass fiber re-enforced thermoset polyester
Pump Head Door: Polycarbonate
Pump Head Enclosure: Bulk Moulding Compound (BMC) - glass fiber reinforced thermoset polyester
Screen Guard: Impact Resistant Polycarbonate
Screen Enclosure: Bulk Moulding Compound (BMC) - glass fiber reinforced thermoset polyester
Tube Element Connectors: PVDF

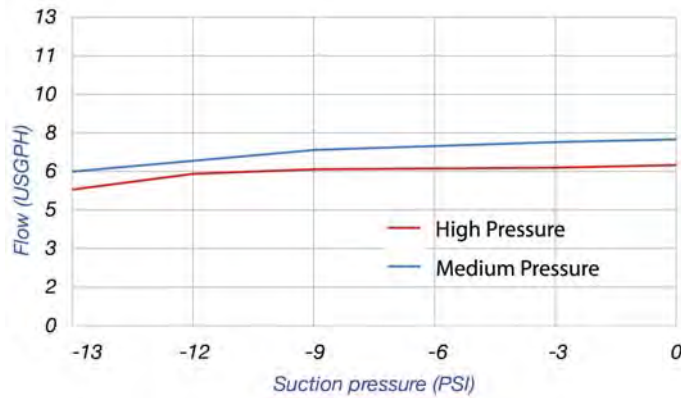
Performance Curves for 1.6 mm Wall Thickness
Verderprene Tubing (1.6, 3.2, 4.0, 4.8 mm I.D.)



Performance Curves for Standard Pressure 2.4 mm Wall
Thickness Verderprene Tubing (3.2, 4.8, 6.4, 8.0, 9.6 I.D.)



**Performance Curves for Medium & High Pressure
2.4 mm Wall Verderprene Tubing**



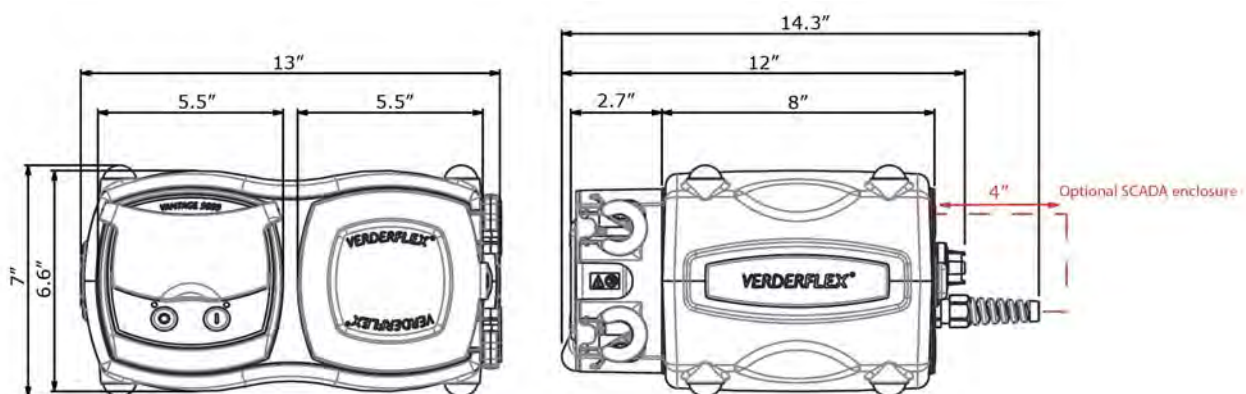
Typical Maximum Flow Rates at 400 RPM

Verderprene 1.6 mm Wall Thickness Tubing				
Tube ID (mm)	ml/min	l/h	US GPM	US GPH
1.6 mm	280	17	0.07	4.4
3.2 mm	920	55	0.24	14.6
4.8 mm	1840	110	0.49	29.2
6.4 mm	3280	196	0.87	52.0
8.0 mm	4600	276	1.22	72.9

Verderprene 2.4 mm Wall Thickness Standard Tubing				
Tube ID (mm)	ml/min	l/h	US GPM	US GPH
3.2	1056	63	0.28	16.7
4.8	2016	121	0.53	32
6.4	3440	206	0.91	54.5
8.0	5000	300	1.32	79.3
9.6	6600	396	1.74	104.6

Verderprene 2.4 mm Wall Thickness Medium & High Pressure Tubing				
Tube ID (mm)	ml/min	l/h	US GPM	US GPH
3.2 (Medium Pressure)	1040	62	0.28	16.5
3.2 (High Pressure)	920	55	0.24	14.6

DIMENSIONS (INCHES)



CONTROL FUNCTIONS

Pump Model	Control	Remote	SCADA	*Wi-Fi	*Modbus®	*Profibus®
Touchscreen display	X	X	X	X	X	X
Variable flow	X	X	X	X	X	X
Dose mode	X	X	X	X	X	X
Batch mode	X	X	X	X	X	X
Timer control mode	X	X	X	X	X	X
Start delay	X	X	X	X	X	X
Auto re-start option	X	X	X	X	X	X
Variable ramp up/down	X	X	X	X	X	X
Anti-drip	X	X	X	X	X	X
Full calibration with choice of flow units	X	X	X	X	X	X
USB file backup	X	X	X	X	X	X
Process specific screen display	X	X	X	X	X	X
Tube burst detector	X	X	X	X	X	X
Three level password protection	X	X	X	X	X	X

Analog Remote Control	Control	Remote	SCADA	*Wi-Fi	*Modbus®	*Profibus®
Stop/start	-	X	X	X	X	X
Product source alarm	-	X	X	X	X	X
Destination full alarm	-	X	X	X	X	X
Direction control	-	X	X	X	X	X
0-10V, 4-20mA (in/out)	-	X	X	X	X	X
Tacho frequency output	-	X	X	X	X	X
Master/Slave mode	-	X	X	X	X	X
24V DC Volt Free Contacts 4 Inputs, 4 Outputs	SCADA LV					
115V AC Volt Free Contacts 4 Inputs, 4 Outputs	SCADA HV					

Digital Remote Control	Control	Remote	SCADA	*Wi-Fi	*Modbus®	*Profibus®
IEEE 802-11 Wi Fi	-	-	-	X	-	-
Modbus®	-	-	-	-	X	X
Profibus®	-	-	-	-	X	X
RS-232 / RS 485	-	-	-	-	X	X

*These models are not as yet in production, please call us to discuss.

ORDERING INFORMATION

1) Select Part Number

2) Select Tubing

Part Number	Head/Connections
Model 5000C CONTROL Version- Manual Control & USB	
152.0002	1.6 mm Wall Thickness, Continuous Tubing
152.3782	2.4 mm Wall Thickness, Continuous Tubing
152.3992	Medium Pressure (4 Bar / 60 PSI) Tube Elements
152.3999	High Pressure (7.5 Bar / 100 PSI) Tube Elements
Model 5000R REMOTE Version- Manual, USB & Analog Remote Control	
152.0366	1.6 mm Wall Thickness, Continuous Tubing
152.3789	2.4 mm Wall Thickness, Continuous Tubing
152.4006	Medium Pressure (4 Bar / 60 PSI) Tube Elements
152.4013	High Pressure (7.5 Bar / 100 PSI) Tube Elements
Model 5000D SCADA LV Version-S ("SCADA") 24V DC : Control plus Additional 4-20 Output & Volt Free Contacts	
152.0730	1.6 mm Wall Thickness, Continuous Tubing
152.3796	2.4 mm Wall Thickness, Continuous Tubing
152.4020	Medium Pressure (4 Bar / 60 PSI) Tube Elements
152.4027	High Pressure (7.5 Bar / 100 PSI) Tube Elements
Model 5000S SCADA HV Version-S ("SCADA") 115V AC : Control plus Additional 4-20 Output & Volt Free Contacts	
152.1094	1.6 mm Wall Thickness, Continuous Tubing
152.3803	2.4 mm Wall Thickness, Continuous Tubing
152.4034	Medium Pressure (4 Bar / 60 PSI) Tube Elements
152.4041	High Pressure (7.5 Bar / 100 PSI) Tube Elements



Continuous Tube (Viton & Verderprene Pictured)



Tube Elements (Quick Release & 3/4" Mini Tri-clamp)

Vantage 5000 Continuous Tube Options				
Material	Wall Thickness (mm)	Tube I.D. (MM)	Part Number	QTY
Verderprene	1.6 mm (Lower Pressure)	1.6	150.0603.1	1m Length
			150.0603.15	15m Pack
		3.2	150.0620.1	1m Length
			150.0620.15	15m Pack
		4.0	150.0643.1	1m Length
			150.0643.15	15m Pack
		4.8	150.0604.1	1m Length
			150.0604.15	15m Pack
		6.4	150.0605.1	1m Length
			150.0605.15	15m Pack
		8.0	150.0606.1	1m Length
			150.0606.15	15m Pack
Silicone	1.6 mm (Lower Pressure)	1.6	460.0006.1	1m Length
			460.0006.15	15m Pack
		3.2	460.0007.1	1m Length
			460.0007.15	15m Pack
		4.0	460.0051.1	1m Length
			460.0051.15	15m Pack
		4.8	460.0008.1	1m Length
			460.0008.15	15m Pack
		6.4	460.0009.1	1m Length
			460.0009.15	15m Pack
		8.0	460.0010.1	1m Length
			460.0010.15	15m Pack

Vantage 5000 Continuous Tube Options					
Material	Connector	Wall Thickness (mm)	Tube I.D. (MM)	Part Number	QTY
Verderprene	Quick Release Connector (QR)	2.4 mm (Lower Pressure)	1.6	159.5005	1
			3.2	159.5006	1
			4.0	159.5007	1
			4..8	159.5008	1
			6.4	159.5009	1
			8.0	159.5010	1
	3/4" Mini Tri-clamp Connector (TR)		1.6	159.5025	1
			3.2	159.5026	1
			4.0	159.5027	1
			4..8	159.5028	1
			6.4	159.5029	1
			8.0	159.5030	1
Verderprene	Quick Release Connector (QR)	2.4 mm (Lower Pressure)	3.2	159.5011	1
			4.8	159.5014	1
			6.4	159.5015	1
			8.0	159.5016	1
			9.6	159.5017	1
			3.2	159.5031	1
	3/4" Mini Tri-clamp Connector (TR)		4.8	159.5034	1
			6.4	159.5035	1
			8.0	159.5036	1
			9.6	159.5037	1
	Quick Release Connector (QR)	2.4 Medium Pressure 4 bar (60 PSI)	3.2	159.5012	1
		2.4 High Pressure 7 bar (105 PSI)	3.2	159.5013	1
	3/4" Mini Tri-clamp Connector (TR)	2.4 Medium Pressure 4 bar (60 PSI)	3.2	159.5032	1
		2.4 High Pressure 7 bar (105 PSI)	3.2	159.5033	1

Vantage 5000 Continuous Tube Options				
Material	Wall Thickness	Tube I.D. (MM)	Part Number	QTY
Tygon R1000	1.6 mm (Lower Pressure)	1.6	150.0810.1	1m Length
		3.2	150.0812.1	
		4.0	150.0814.1	
		4.8	150.0816.1	
Viton	1.6 mm (Lower Pressure)	1.6	150.0830.1	
		3.2	150.0832.1	
		4.0	150.0834.1	
		4.8	150.0836.1	
Vedreprene	2.4 mm (Lower Pressure)	3.2	150.0644.1	1m Length
			150.0644.15	15m Pack
		4.8	150.0625.1	1m Length
			150.0625.15	15m Pack
		6.4	150.0623.1	1m Length
			150.0623.15	15m Pack
Silicone	2.4 mm (Lower Pressure)	8.0	150.0626.1	1m Length
			150.0626.15	15m Pack
		3.2	460.0052.1	1m Length
			460.0052.15	15m Pack
		4.8	460.0053.1	1m Length
			460.0053.15	15m Pack
		6.4	460.1032.1	1m Length
			460.1032.15	15m Pack
Viton	2.4 mm (Lower Pressure)	8.0	460.0705.1	1m Length
			460.0705.15	15m Pack
		6.4	150.0840.1	1m Length
		8.0	150.0842.1	



Spare Parts		
	Description	Part Number
1	Screen Protector	159.5019
2	Pump Door (Assembly)	159.5022
3	Standard Feet Pack	159.5020
	Optional Stacking Feet for Landscape Orientation	159.5018
4	Rotor Assy 1.6 WT tube, Lower Pressure, BLUE	159.5000
	Rotor Assy 2.4 WT tube, Lower Pressure, GREEN	159.5001
	Rotor Assy 2.4 WT tube, Medium Pressure, YELLOW	159.5002
	Rotor Assy 2.4 WT tube, High Pressure, ORANGE	159.5003

Spare Parts		
	Description	Part Number
5	Tube Clamp	159.5004
6	USB Cover	159.5021
7	Breakout Box, 24 VDC	159.5023
	Breakout Box, 115 VDC	159.5024
8	Continuous Tube	See Tables
9	Tube Clamp	

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

SPECIFICATIONS

Pump Housing: Bras or AISI 303 Stainless Steel

Pumping Chamber: Carbon Graphite

Ports: 3/8" NPT

Max Temperature : 70° C (158° F)



TYPICAL APPLICATIONS

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



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)

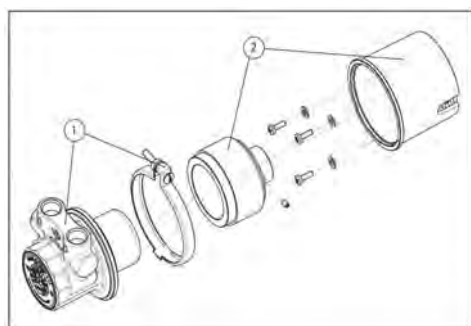
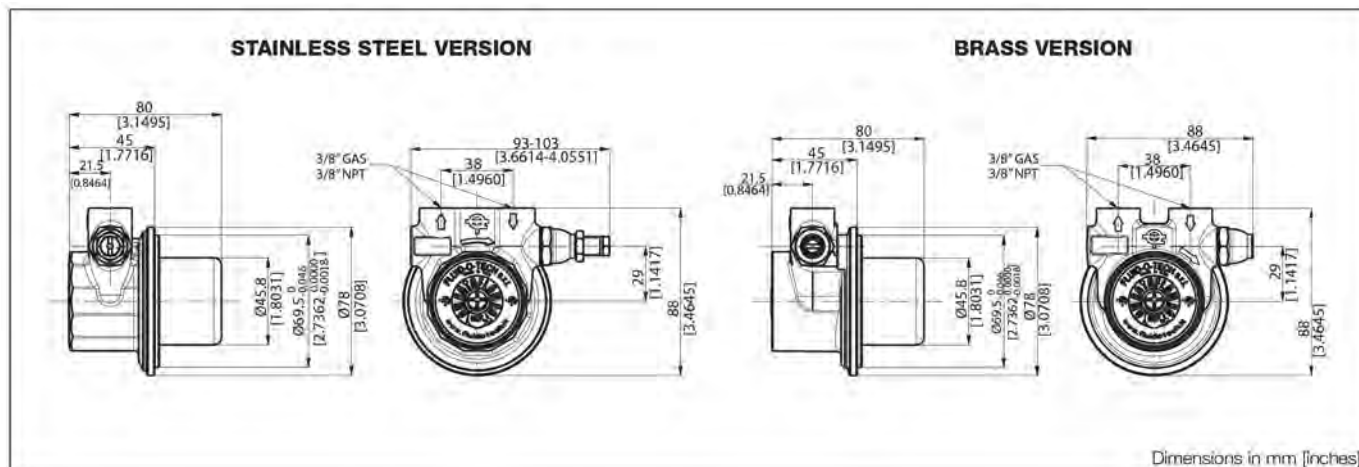


Table 1

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

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

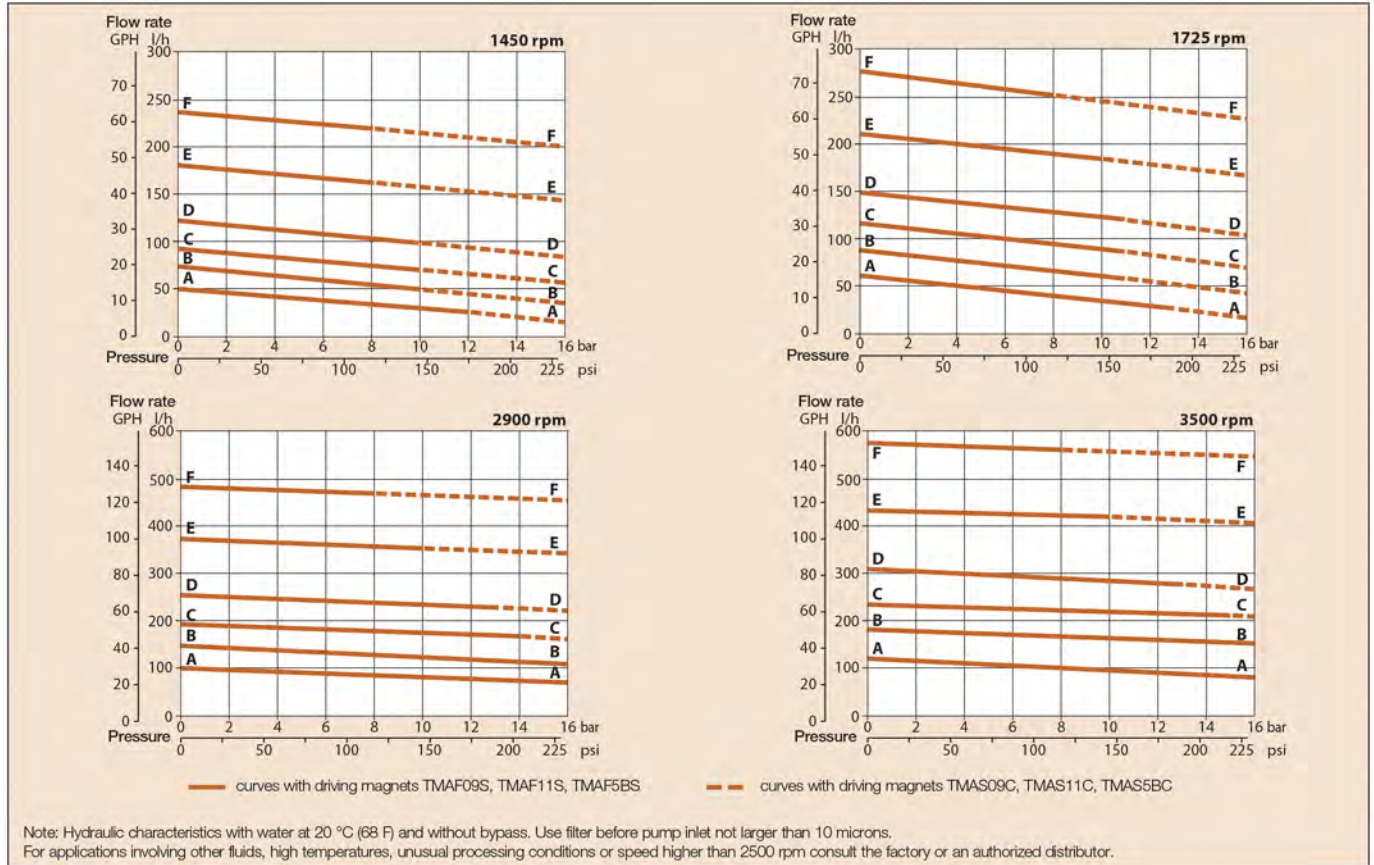


Table 2

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
TMOT030	No	Brass	A-A
TMOT050			B-B
TMOT070			C-C

Model	Relief Valve	Housing	Figure
TMOT100	No	Brass	D-D
TMOT150			E-E
TMOT200			F-F
TMOT031			A-A
TMOT051	Standard	Brass	B-B
TMOT071			C-C
TMOT101			D-D
TMOT151			E-E
TMOT201			F-F
TMOT034	Balanced	Brass	A-A
TMOT054			B-B
TMOT074			C-C
TMOT104			D-D
TMOT154			E-E
TMOT204			F-F

CLARK

TMCF Series Magnet 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 female threads. All models are available with NBR, Viton or EPDM seals. Compared to conventional coupling, the magnet drive have several advantages :

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

SPECIFICATIONS

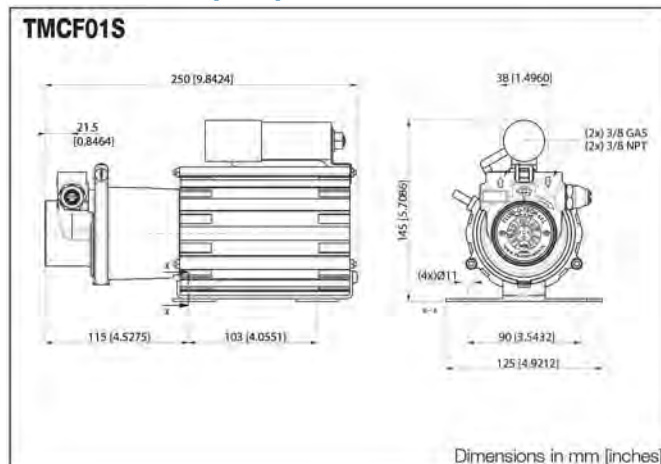
Pump Housing: Brass or AISI 303 Stainless Steel

Pumping Chamber: Carbon Graphite

Ports: 3/8" NPT

Max Temperature : 70° C (158° F)

DIMENSIONS (MM)



TYPICAL APPLICATIONS

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



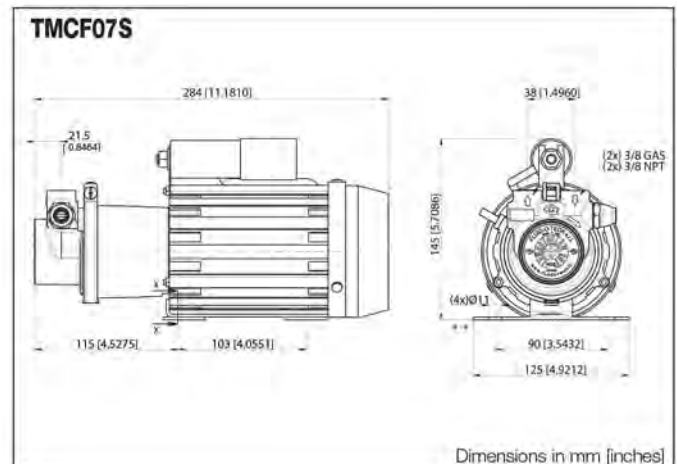
Seals: NBR (Viton, EPDM upon request)

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)



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).

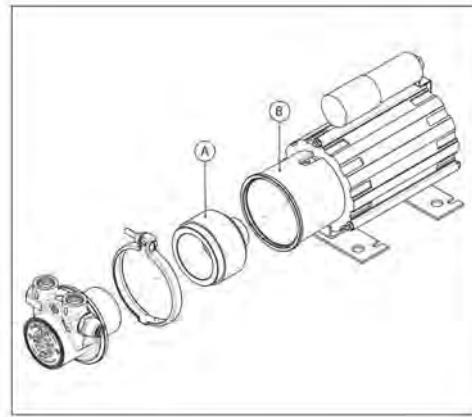
The cracking pressure can be field set by adjusting the spring tension with the adjusting screw. If the cracking pressure is not customer specified it is factory preset at approximately 190 PSI for TM 30-200 series.

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.

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

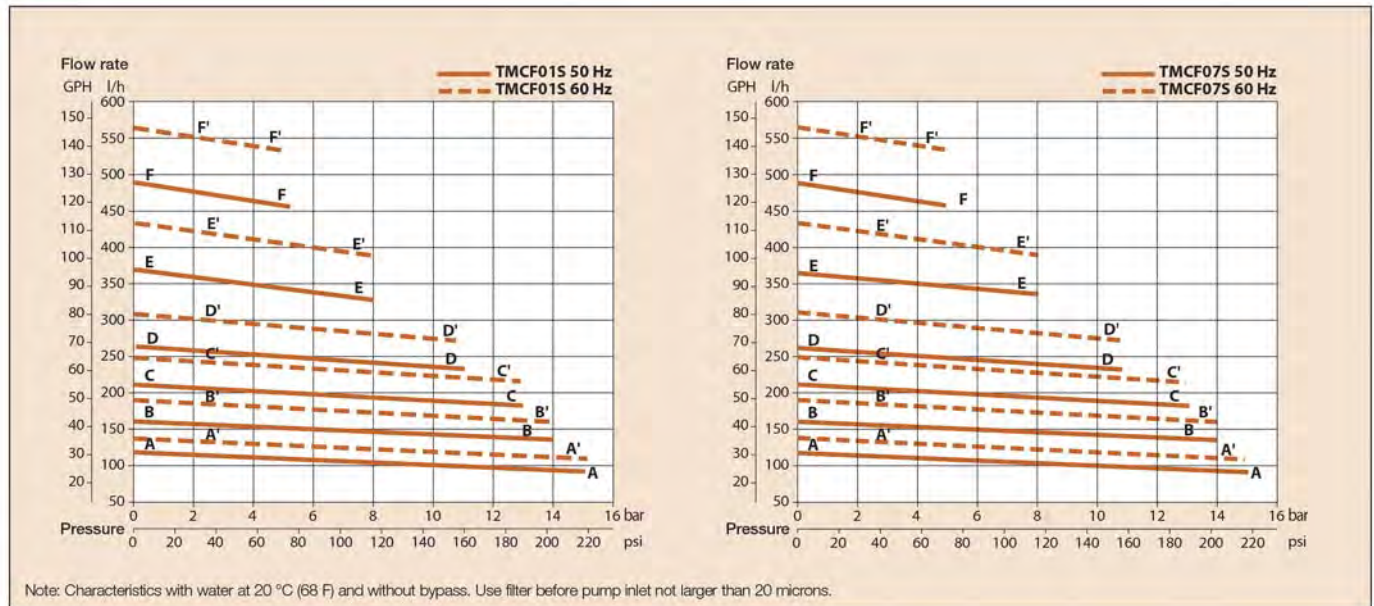


Table 2

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
TMOT030	No	Brass	A-A
TMOT050			B-B
TMOT070			C-C

Model	Relief Valve	Housing	Figure
TMOT100	No	Brass	D-D
TMOT150			E-E
TMOT200			F-F
TMOT031	Standard	Brass	A-A
TMOT051			B-B
TMOT071			C-C
TMOT101			D-D
TMOT151			E-E
TMOT201			F-F
TMOT034	Balanced	Brass	A-A
TMOT054			B-B
TMOT074			C-C
TMOT104			D-D
TMOT154			E-E
TMOT204			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.

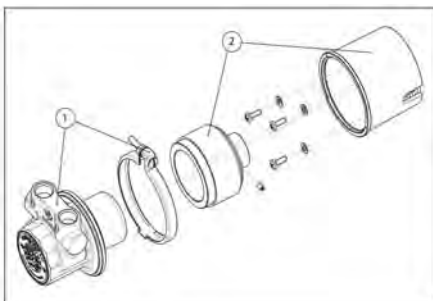
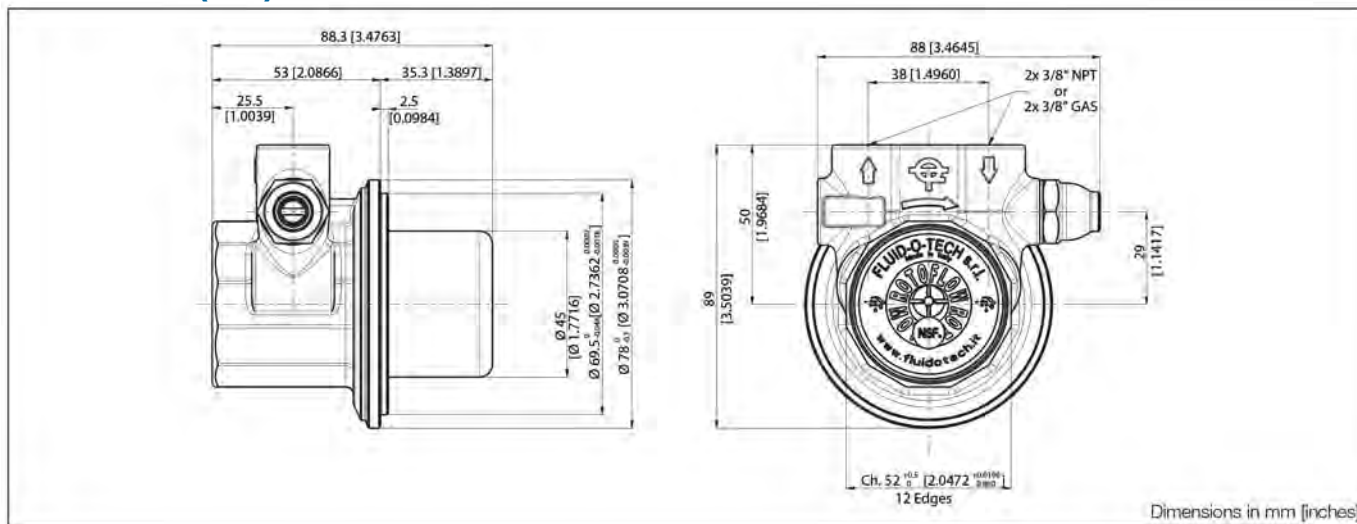
The TM 300-400 housing is AISI 303 stainless steel with carbon graphite internal components. The pumps can be equipped with an optional built-in relief/bypass valve. Inlet and outlet ports have 1/2" NPT female threads. All models are available with NBR, Viton or EPDM static seals. Compared to conventional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

SPECIFICATIONS

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

DIMENSIONS (MM)



TYPICAL APPLICATIONS

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



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)

Table 1

Motor Adapter		
Position	Description	Part Number
1	TH Series Pump	Table 2
2	High Torque Mounting Assembly (M56-B16)	TMB556C
	High Torque Mounting Assembly (M63-B14)	TMB563C
	High Torque Mounting Assembly (NEMA 56C)	TMB55BC

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

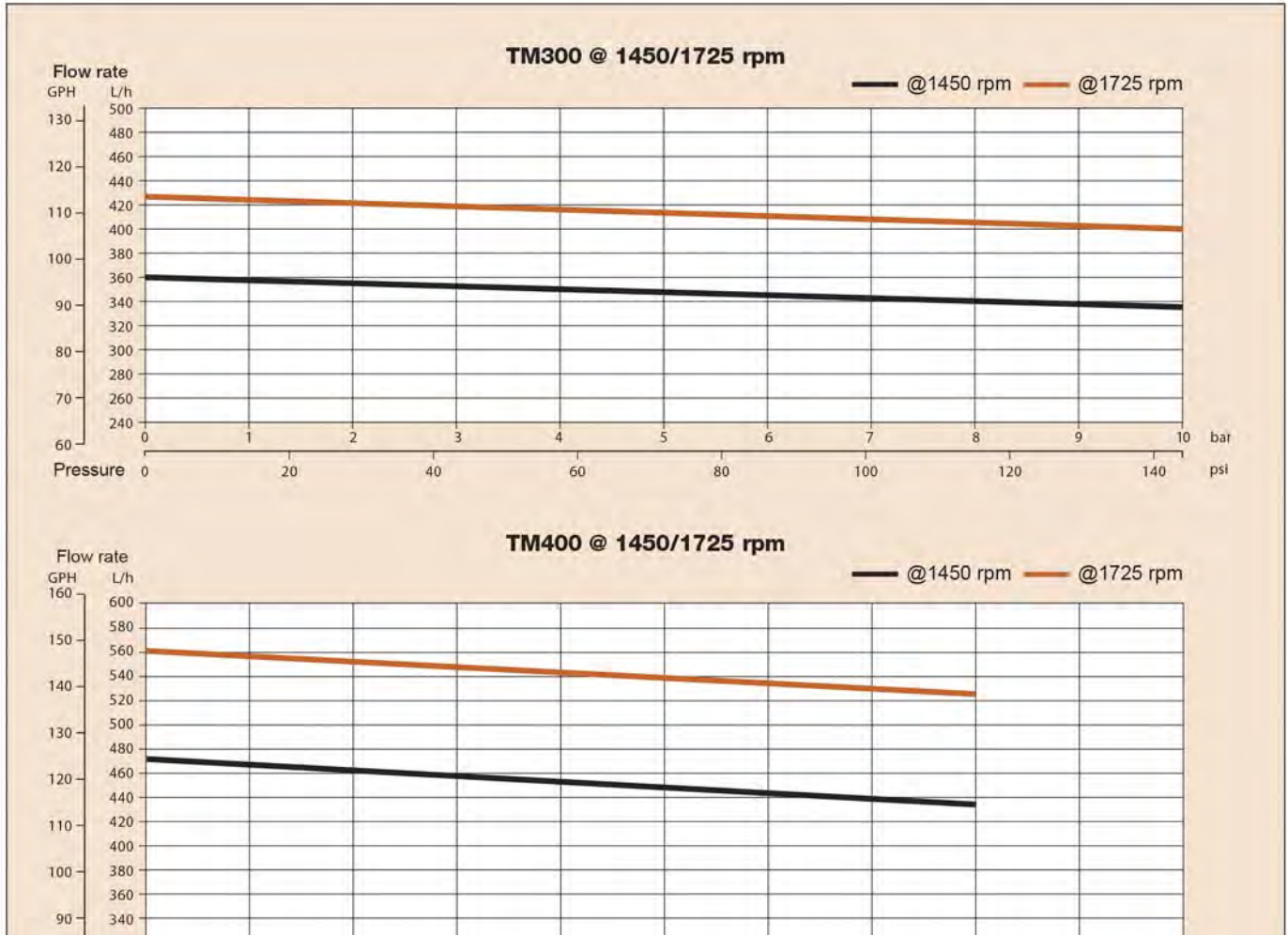


Table 2

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)

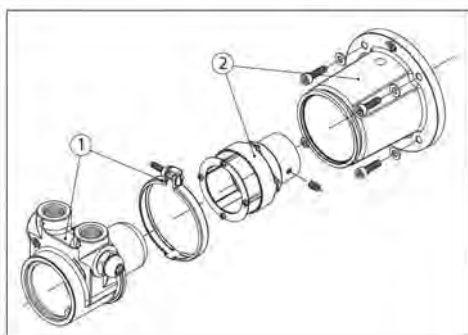
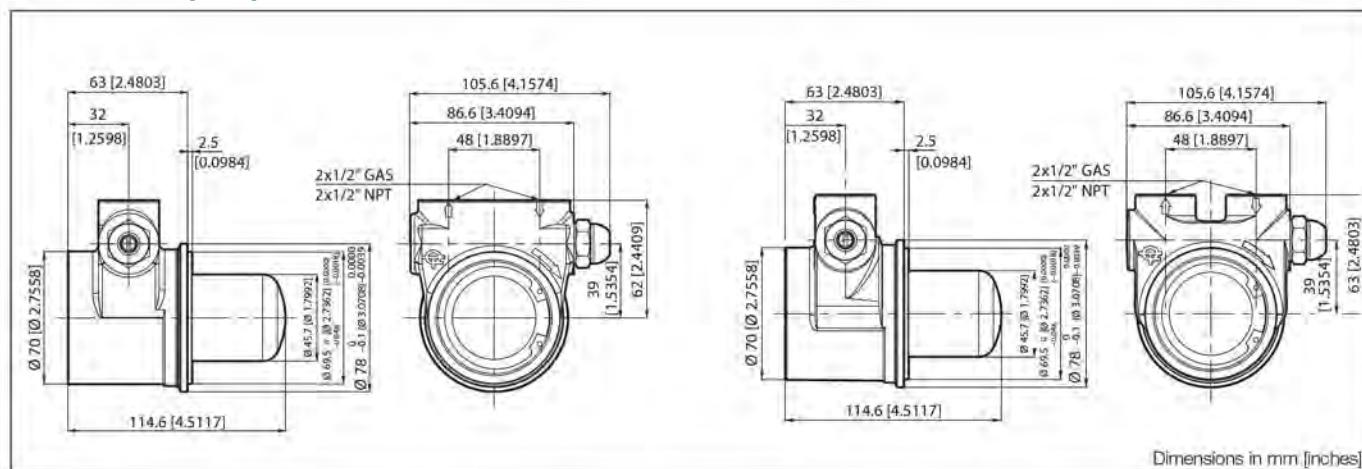


Table 1

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

ABOUT RELIEF VALVES

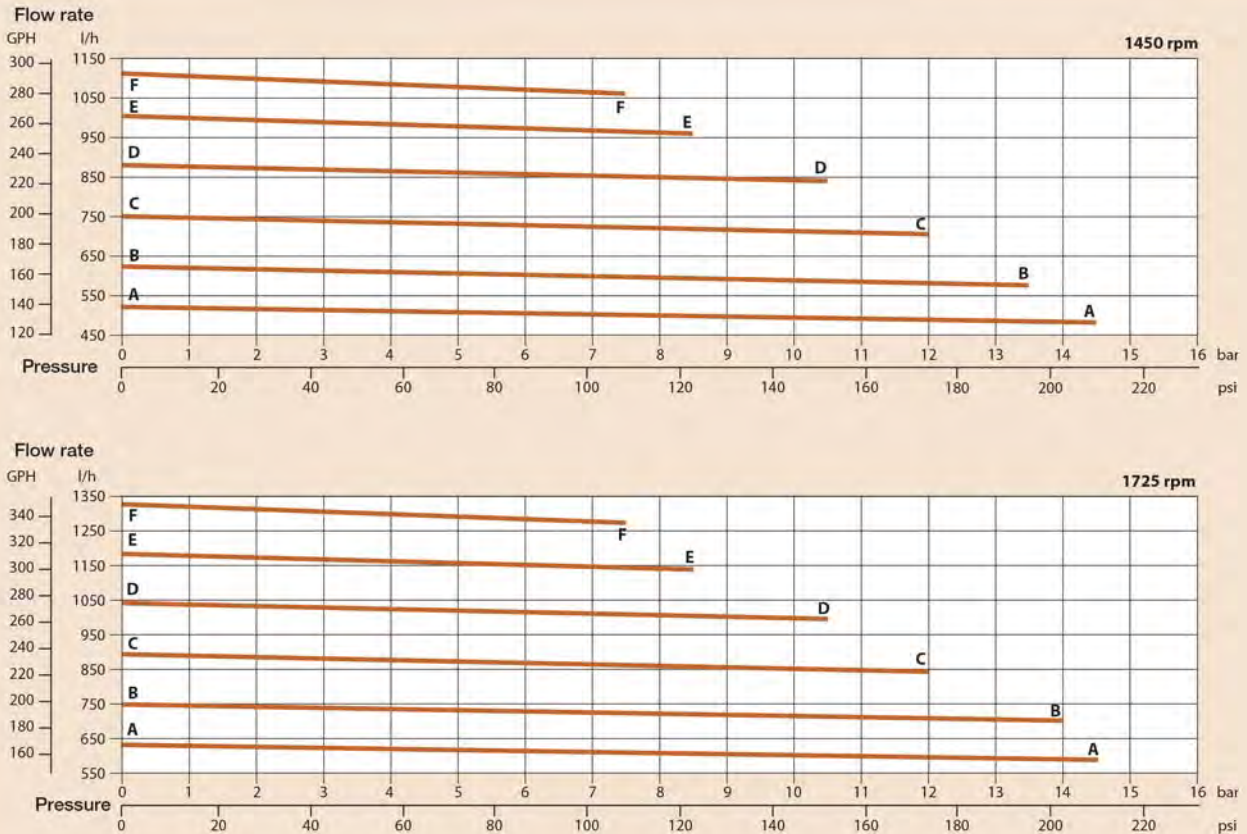
Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

- 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 distributor.

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	Stainless Steel	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	Brass	A-A
THOT601A			B-B
THOT701A			C-C
THOT801A			D-D
THOT901A			E-E
THOT1001A			F-F

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.

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

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.



Model TMFR & Power Supply/Speed Controller

-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	-Espresso Machines

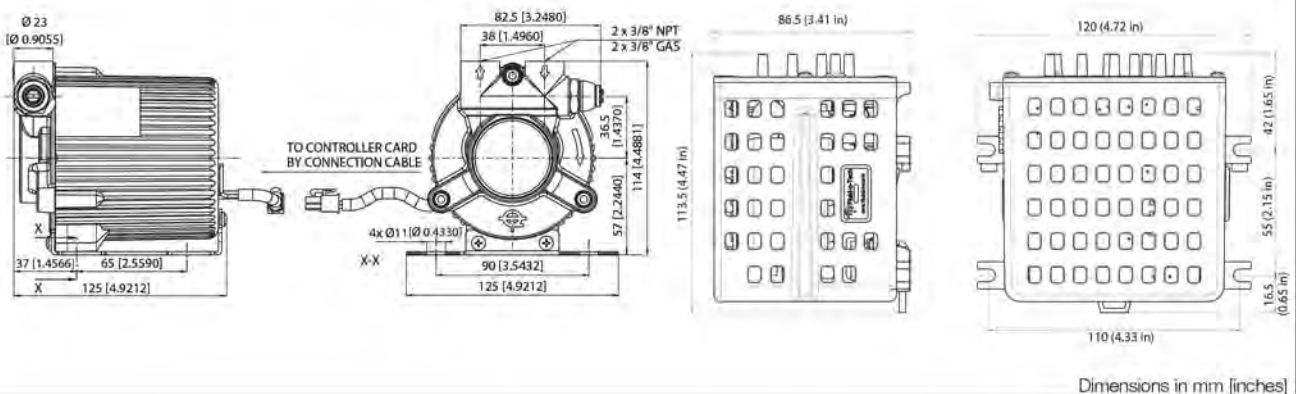
Fault Outputs:

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



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

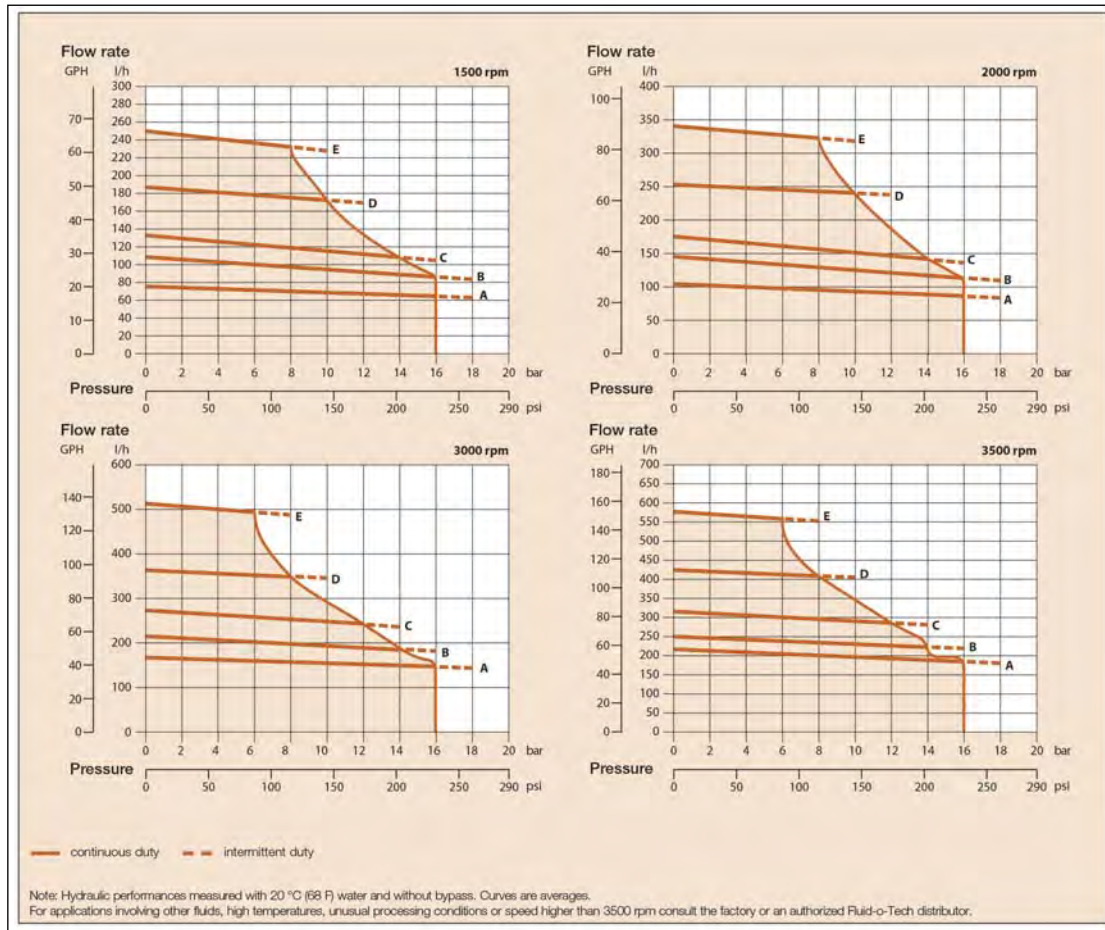


Table 1

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.

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



Model TSFR & Power Supply/Speed Controller

-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
-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.

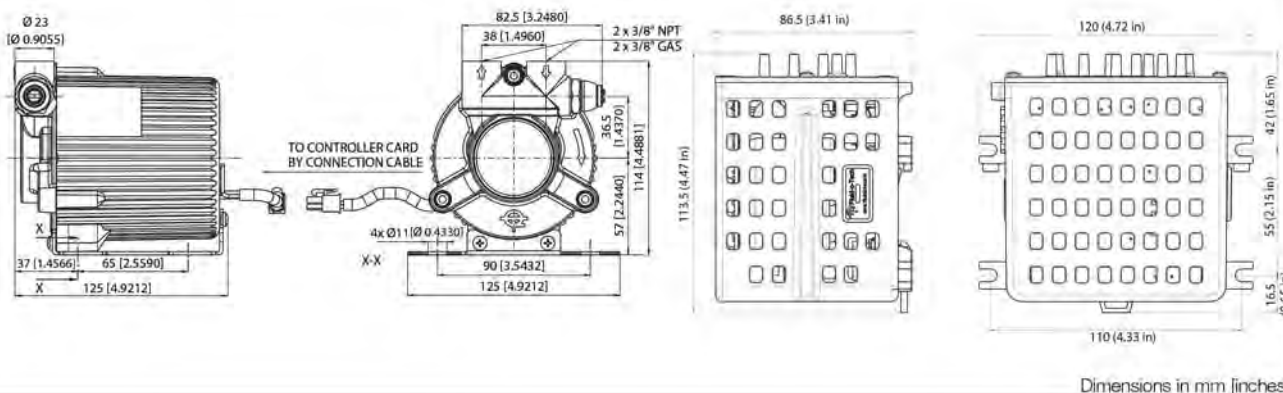
Fault Outputs:

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



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

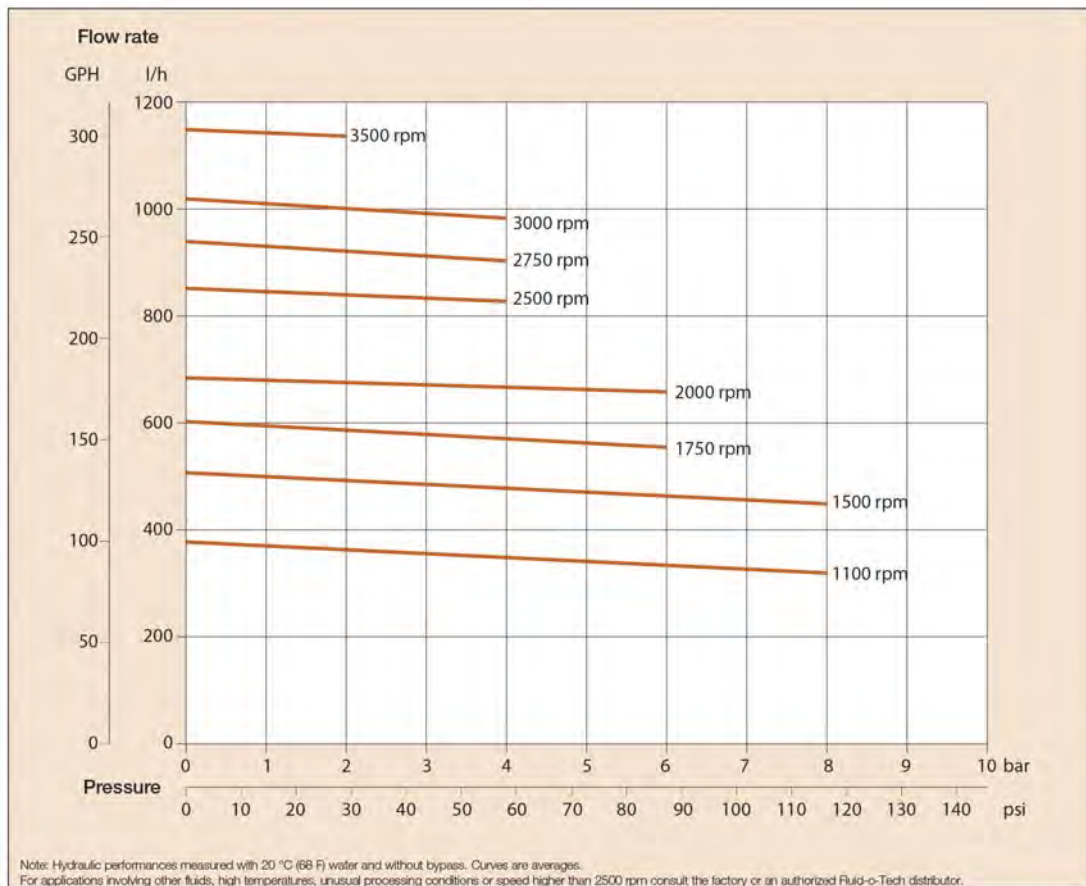


Table 1

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

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.

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)



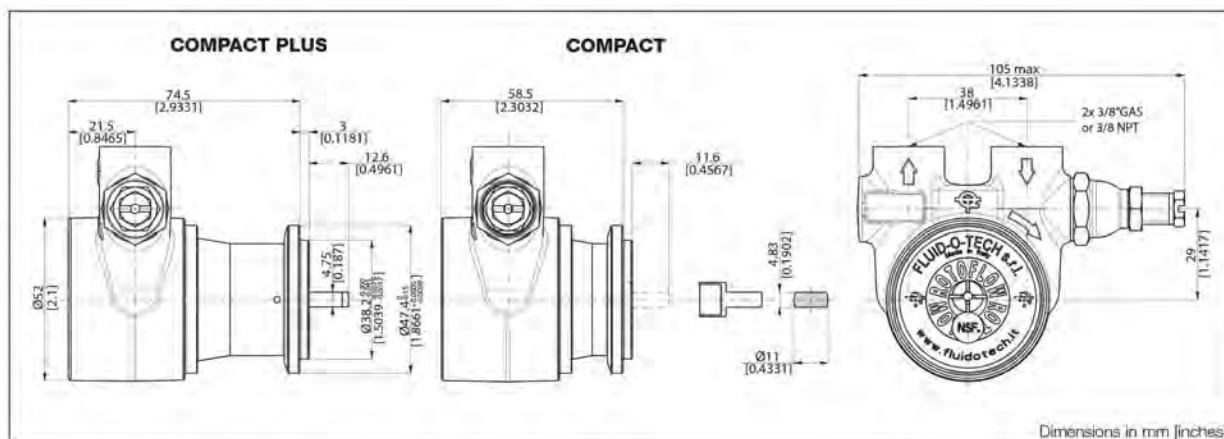
TYPICAL APPLICATIONS

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



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



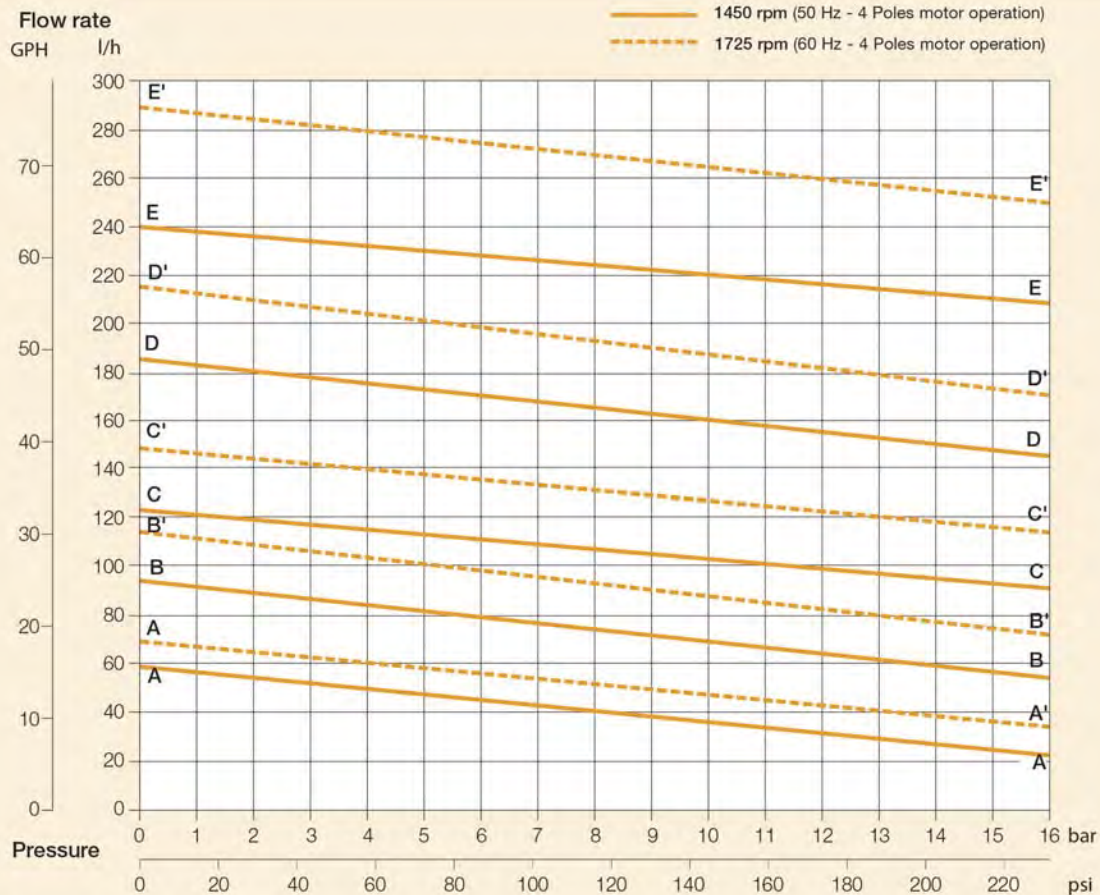
Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

- 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.

PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER

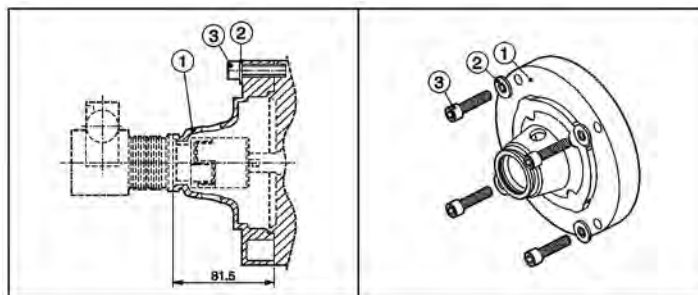


Model	CA050	CA051	CA054	CA070	CA071	CA074	CA100	CA101	CA104	CA150	CA151	CA154	CA200	CA201	CA204
Flow Figure	A-A			B-B			C-C			D-D			E-E		
Relief Valve	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL	NO	STD	BAL

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

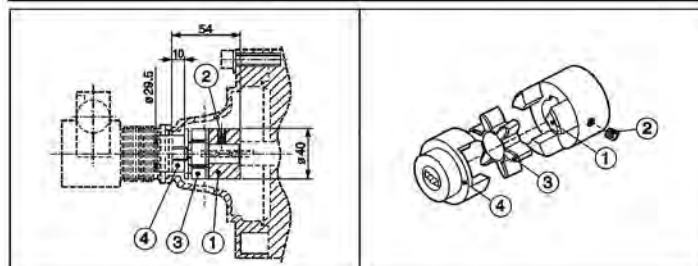
Model 92-80-03 NEMA 56C Adapter

#	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



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.

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)



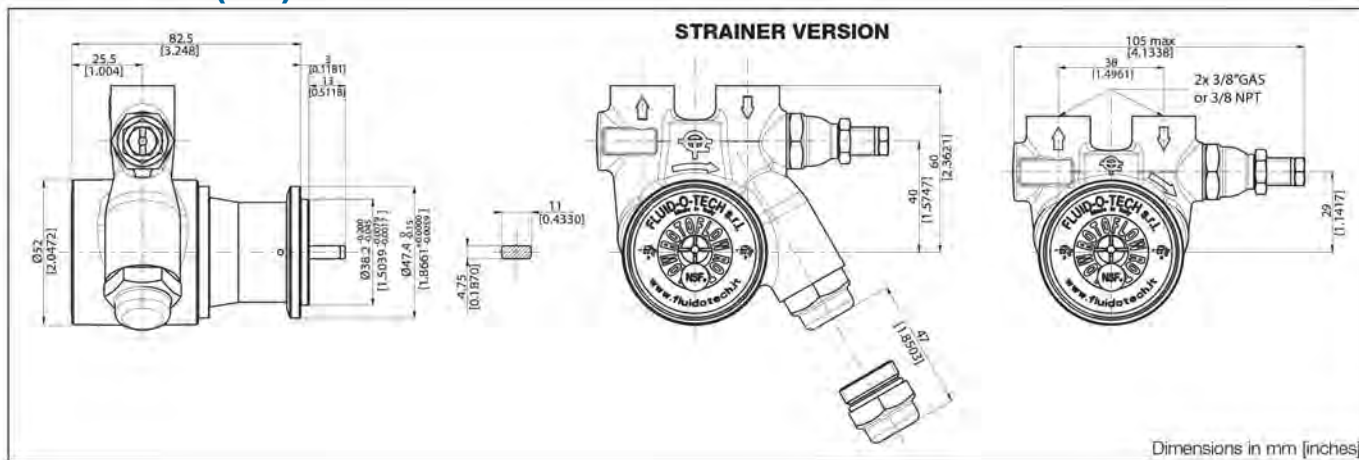
TYPICAL APPLICATIONS

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



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:

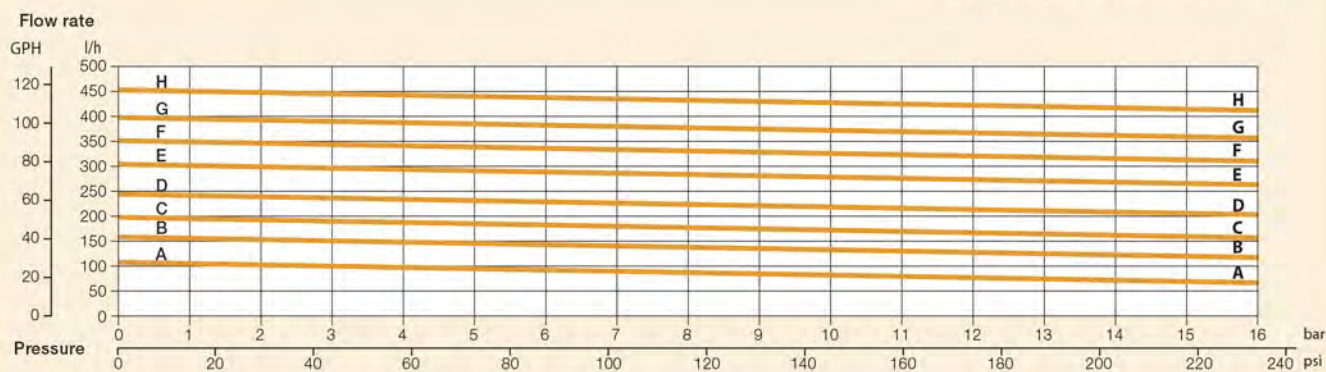
- 1) Standard Relief Valve: A spring loaded bypass check valve diverts flow from the pump outlet to the pump inlet when outlet pressure exceeds setpoint (set with spring tensioning set screw).
- 2) Balanced relief valve: A pressure compensation plunger with dynamic seal and referenced (ported on one 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.

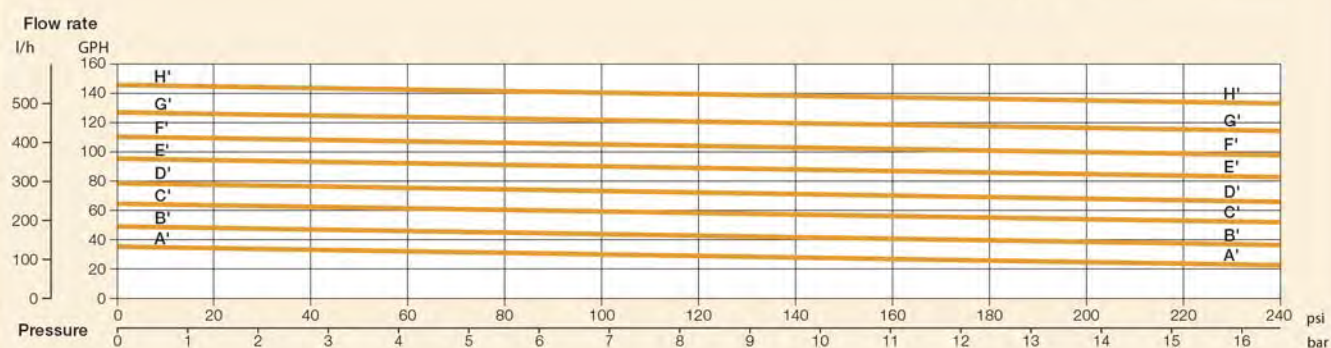
It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER

1450 rpm (50 Hz - 4 Poles motor operation)



1725 rpm (60 Hz - 4 Poles motor operation)



Note: Characteristics at constant motor speed, water at 20 °C (68 F) and bypass blocked.

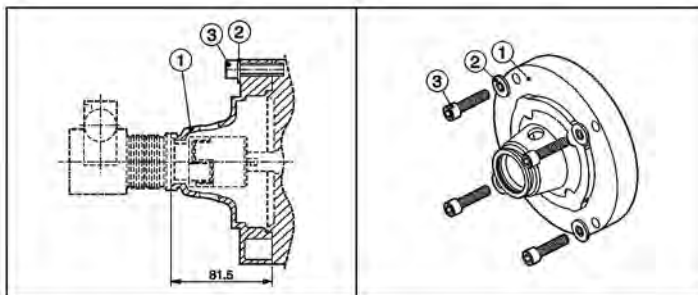
For applications involving other fluids, high temperatures or unusual processing conditions, please consult the factory or an authorized Fluid-o-Tech distributor.

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

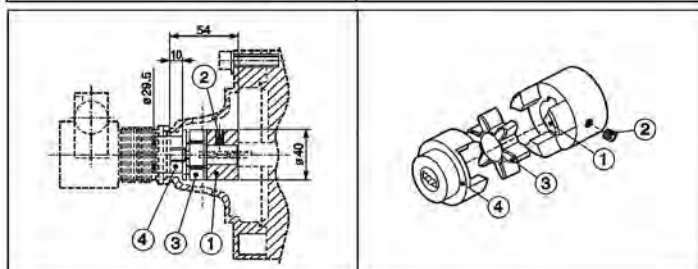
Model 92-80-03 NEMA 56C Adapter

#	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



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.

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)



TYPICAL APPLICATIONS

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

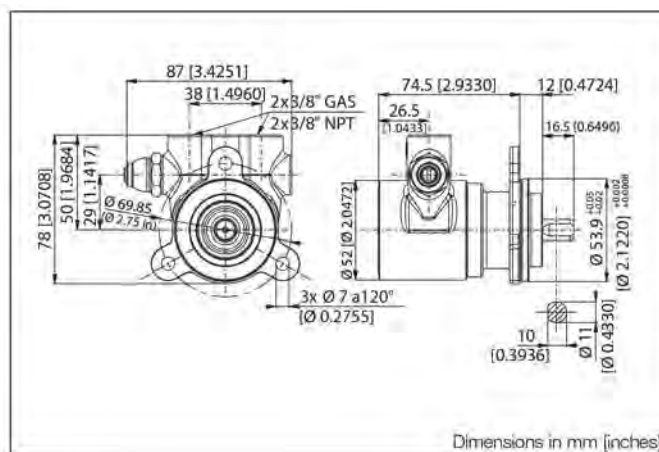
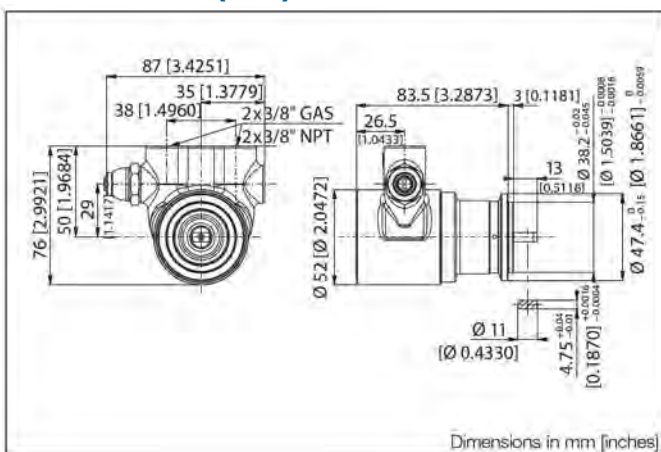


Max System Pressure : 20 Bar (290 psi)

Mounting: Clamp or Flange

Pump Weight: clamp mount- 1.2 kg (2.7 lb)
flange mount- 1.5 kg (3.3 lb)

DIMENSIONS (MM)



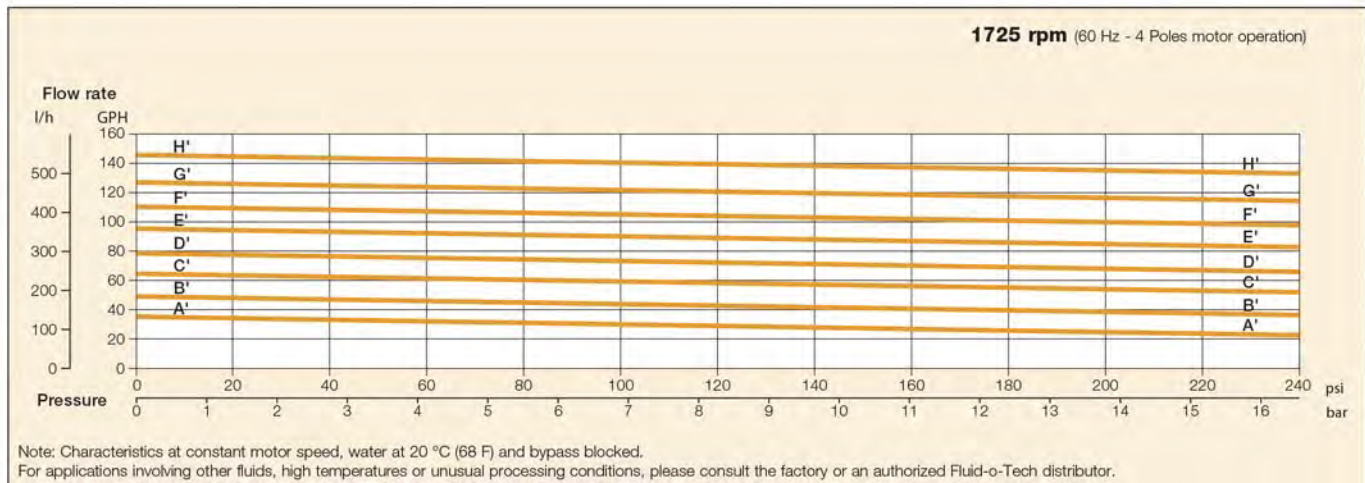
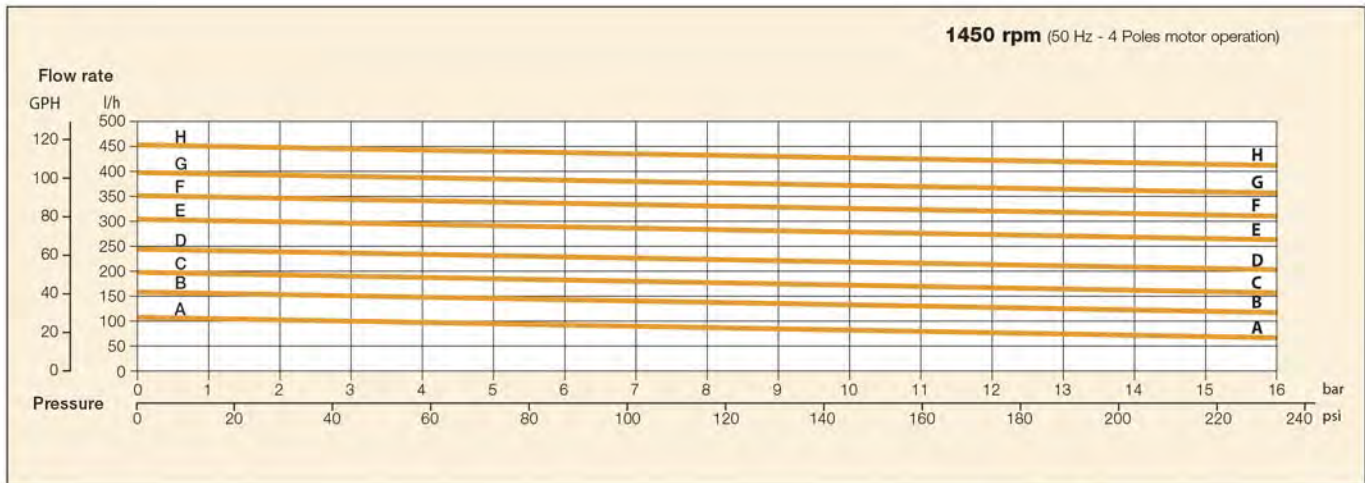
Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

- 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.

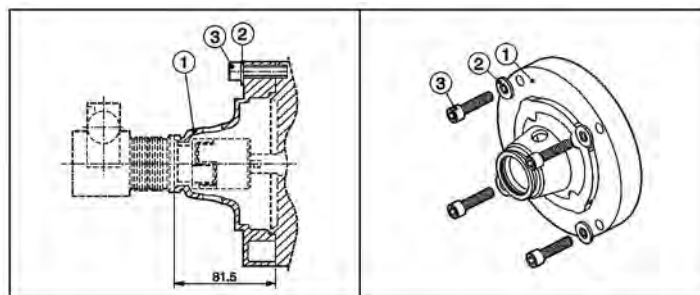
PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER



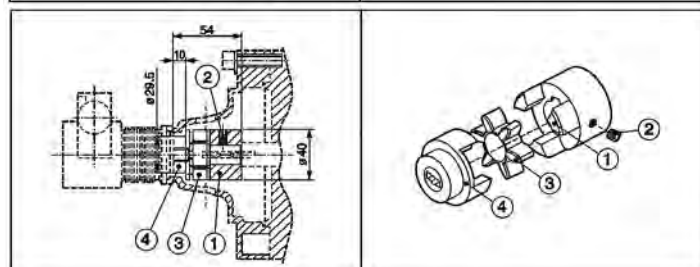
Model	PA0710	PA0711	PA0711F	PA110	PA111	PA111F	PA1510	PA1511	PA1511F	PA210	PA211	PA211F
Flow Figure	A-A			B-B			C-C			D-D		
Mounting	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange	Clamp	Clamp	Flange
Relief Valve	NO	STD	STD	NO	STD	STD	NO	STD	STD	NO	STD	STD

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



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 1/2" 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

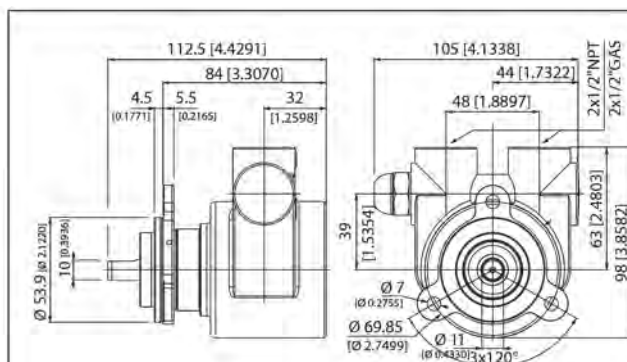
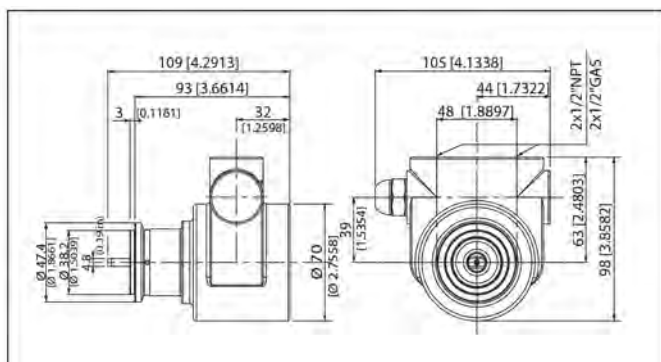
- Post mix dispensers
- Cooling and booster systems
- Reverse osmosis
- Fuel injection systems
- Ultra filtration



NSF/ANSI 169

Stainless steel models also evaluated and determined to possess weighted average lead content of $\leq 0.25\%$ 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)



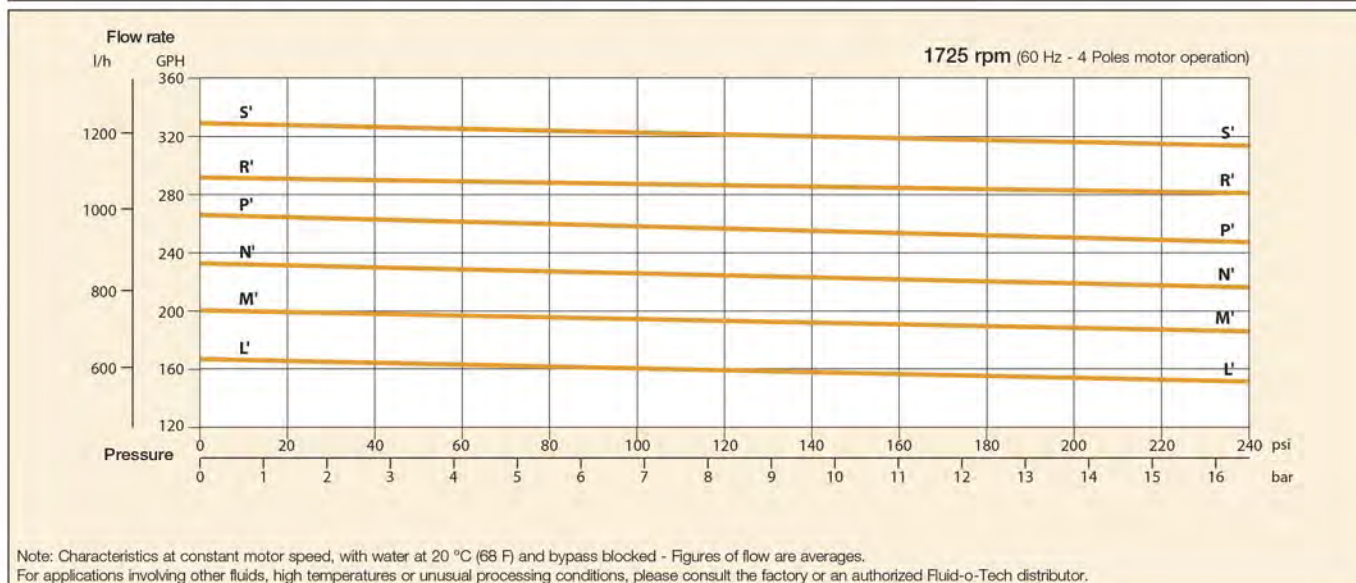
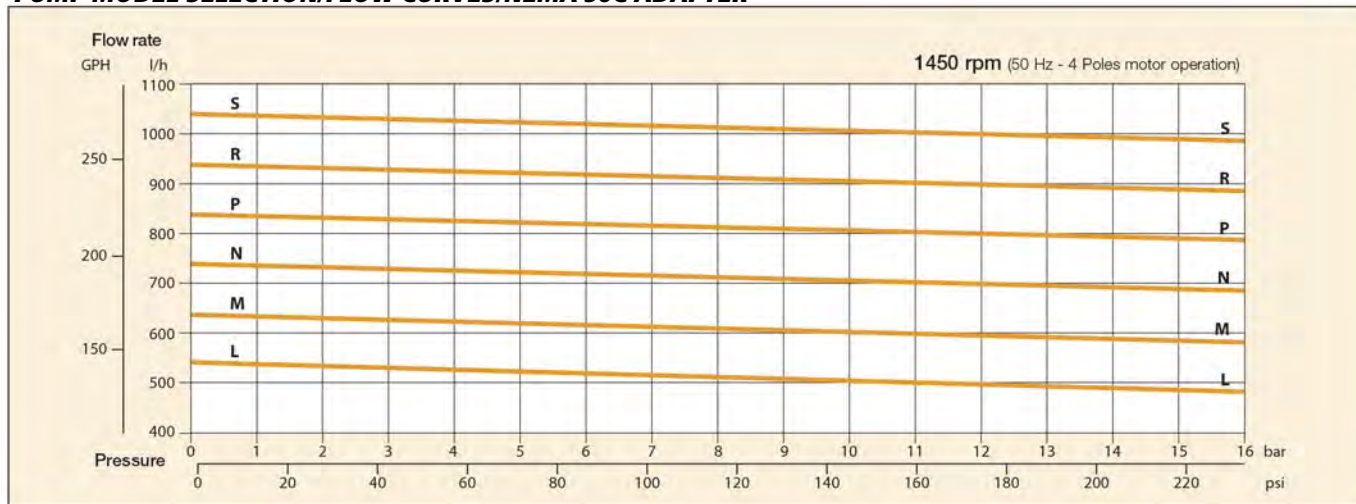
Relief valves are offered on select models of rotary vane pumps throughout the product line. Two types of relief valves are offered:

- 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.

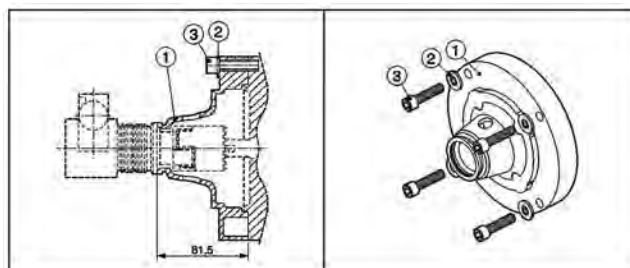
It is not recommended to use the relief/bypass valve for flow control. This will result in premature wear of the valve assembly and require frequent maintenance.

PUMP MODEL SELECTION/FLOW CURVES/NEMA 56C ADAPTER

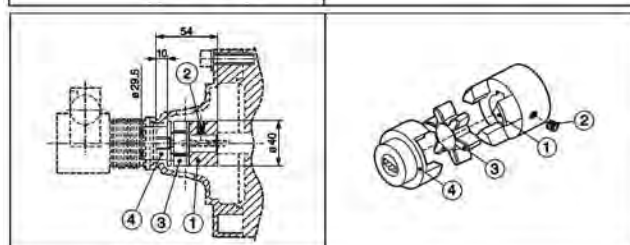


Brass Model	PA500	PA501	PA500F	PA501F	PA600	PA601	PA600F	PA601F	PA700	PA701	PA700F	PA701F	PA800	PA801	PA800F	PA801F	PA900	PA901	PA900F	PA901F	PA1000	PA1001	PA1000F	PA1001F
Flow Figure	L-L				M-M				N-N				P-P				R-R				S-S			
Mounting	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	Flange	Clamp	Clamp	Flange	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

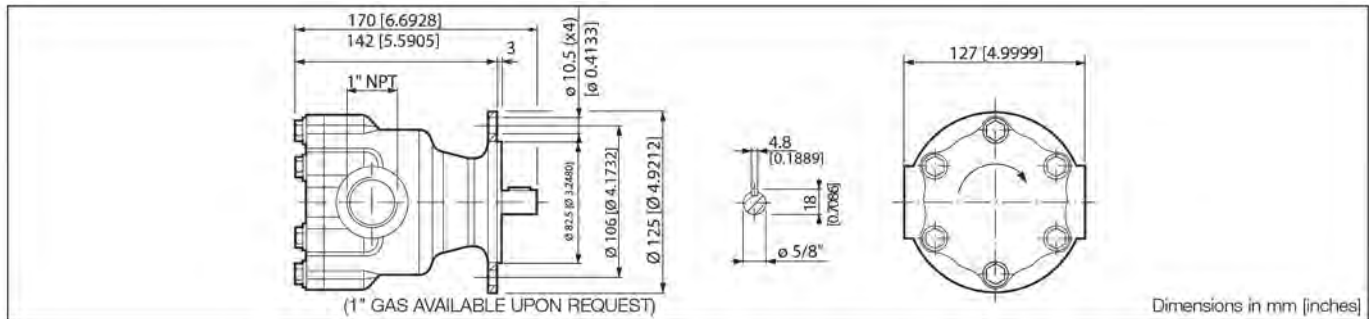
The 4000 series rotary vane pumps are available in 7 different displacements from 325 to 740 GPH at 1450 rpm and are the latest edition of high technology volumetric pumps to our line. The pump housing, the rotor and every metallic component are AISI 303 stainless (AISI 316 is also available). The pumping 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

DIMENSIONS (MM)



TYPICAL APPLICATIONS

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

MOUNTING

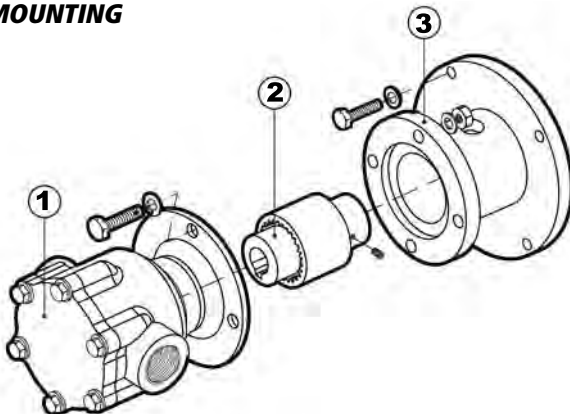


Table 1

#	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

PUMP MODELS & FLOW CURVES

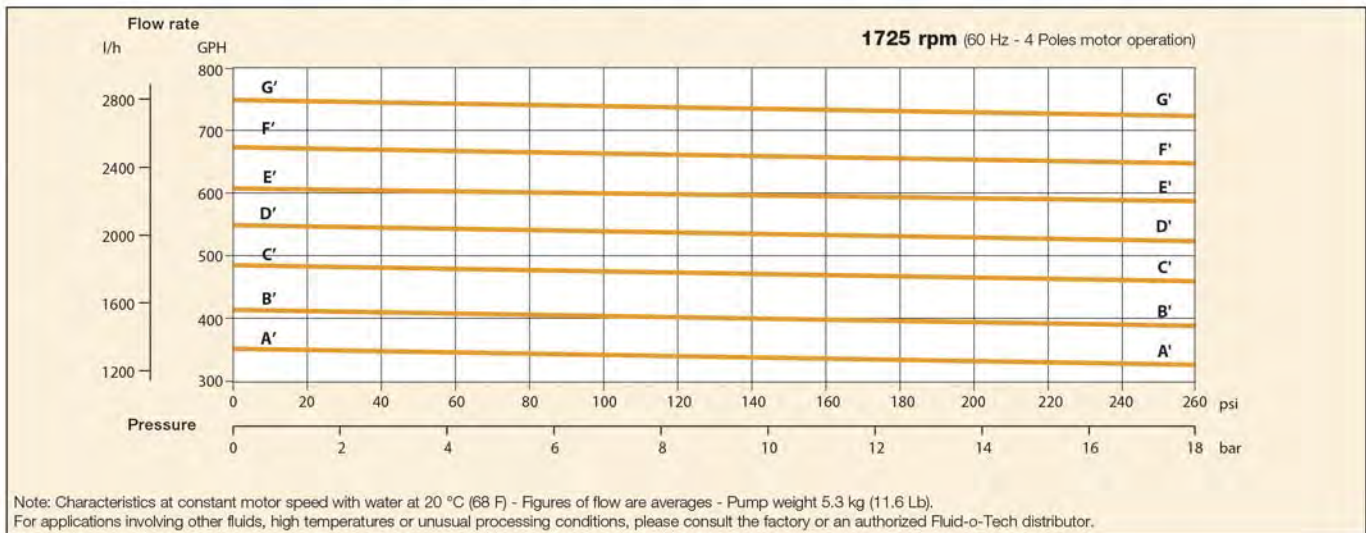
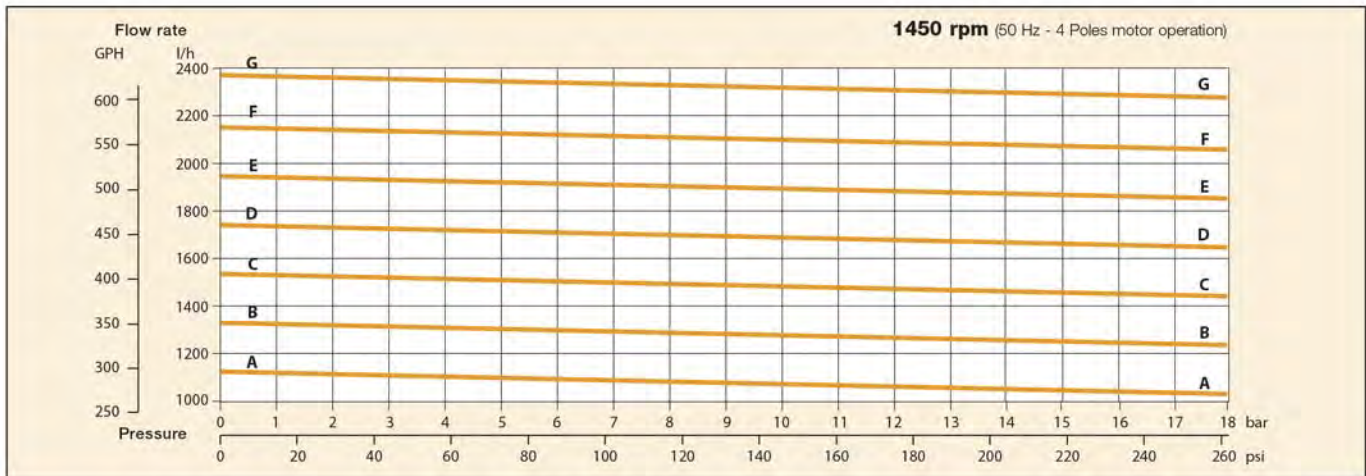


Table 2

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

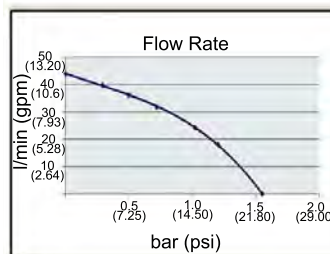
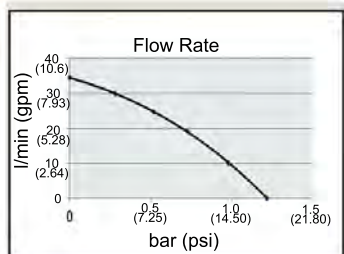
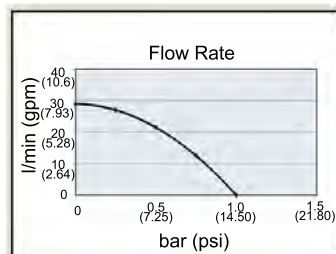
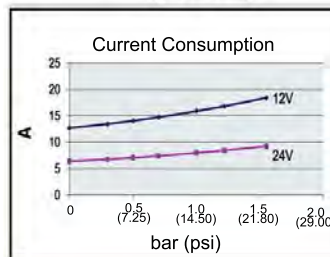
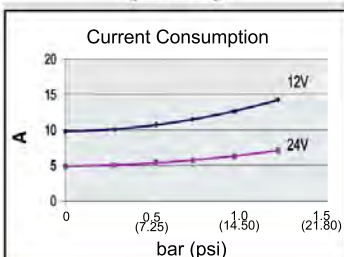
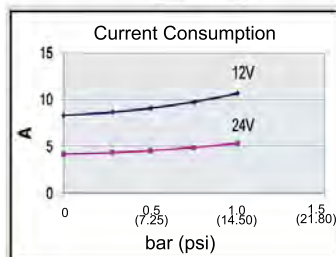
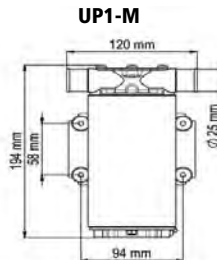
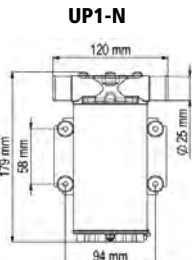
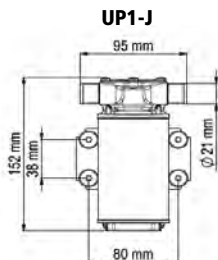
Water to 11.9 GPM

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.



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
UP1-N-24V	24 VDC	-	1.5 (5)	1.2 (17.4)	35 (9.25)	4	3/4" NPT Male
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

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

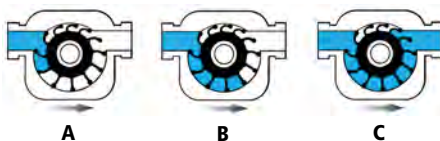
The pump series N & U, manufactured in Germany, are driven with a drill. The shaft is fixed to the chuck of a regular regular electric or cordless drill equipped with a depth stop. The pump head is supplied with an adaptor that is secured to the drill depth stop rod to prevent the pump from spinning.

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) 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 temperatures, 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 irrigation rain water harvesting domestic water supply decanting barrels draining waste oil sewerage disposal car wash tank draining cooling lubricants	clean tanks cleaning ponds delivering filtering dosing decanting draining chemicals acids 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

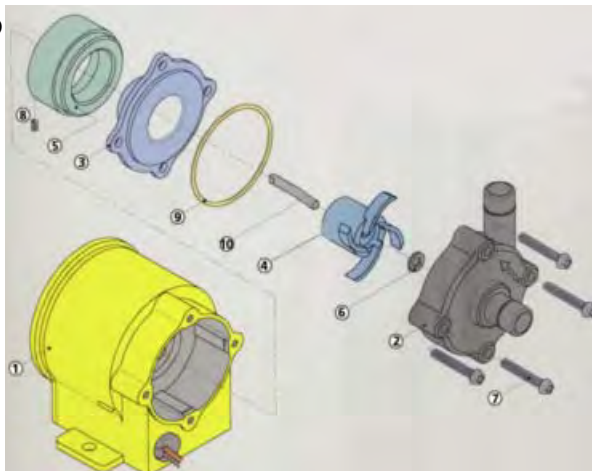
Motor Case- Aluminum

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

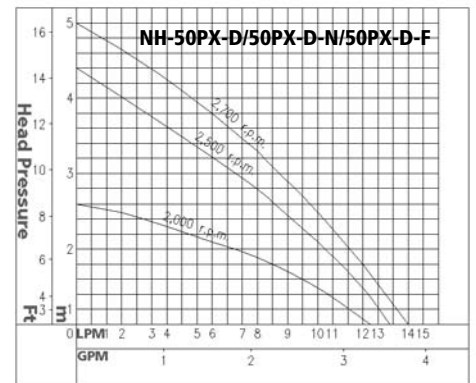
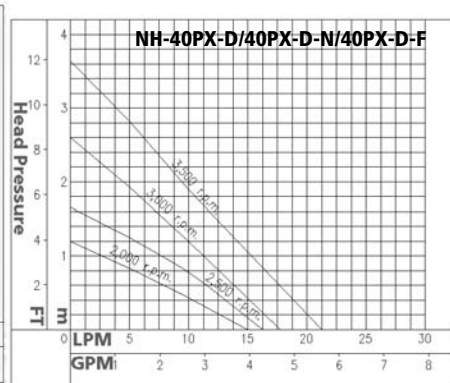
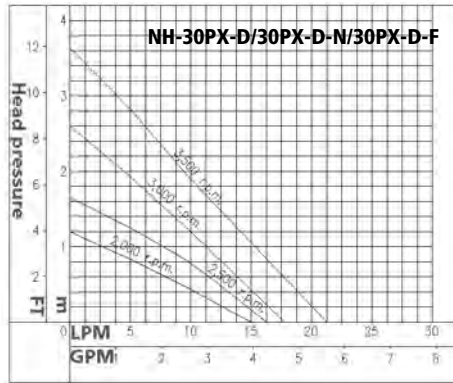
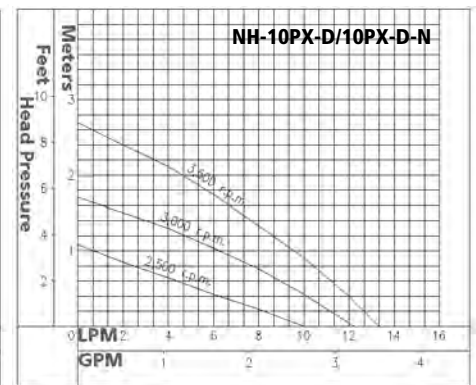
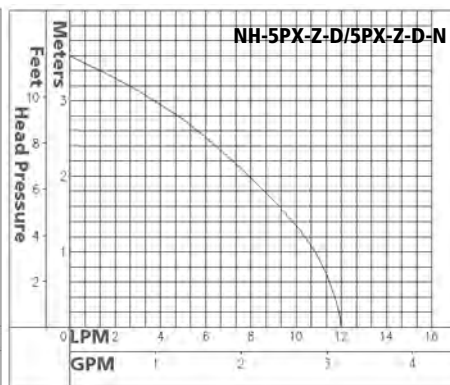
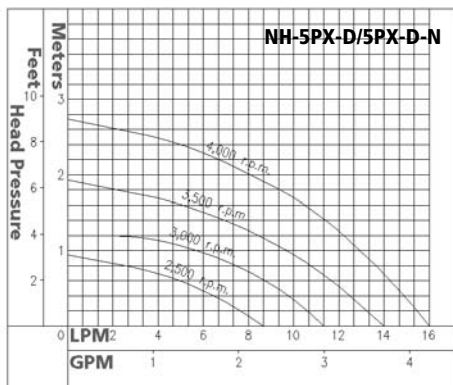
SPECIFICATIONS

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	24Vdc/20w
NH-30PX-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	2.80-16.00	
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	24Vdc/25w
NH-40PX-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	3.10-26.00	
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	24Vdc/25w
NH-50PX-Z-D-N	PVDF	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3000	4.30-13.00	
NH-50PX-Z-D-F	ETFE	*Ceramic	Rulon™	*Ceramic	NBR,FKM,EPDM	18	3/4"	3500	3.60-18.60	

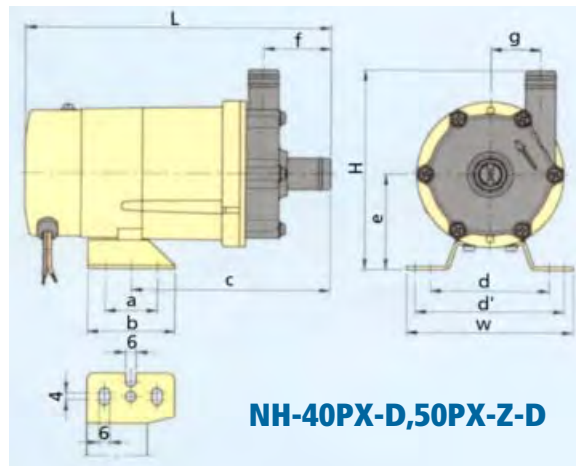
Ordering Note- Specify the voltage required when ordering. 12 Vdc or 24 Vdc for models 5PX & 10PX, 24Vdc for all other models.

*SiC is optionally available, consult factory

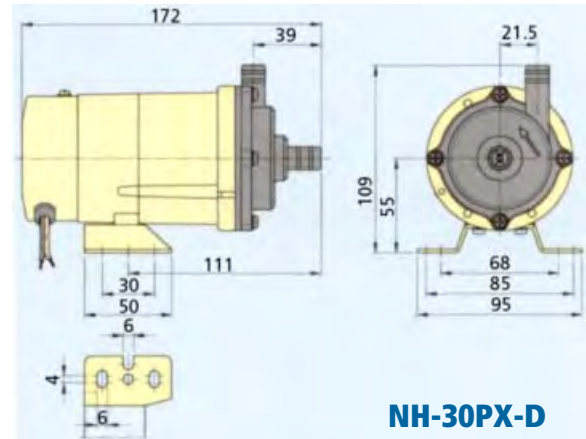
FLOW CURVES



DIMENSIONS(MM)



NH-40PX-D, 50PX-Z-D



NH-30PX-D

	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

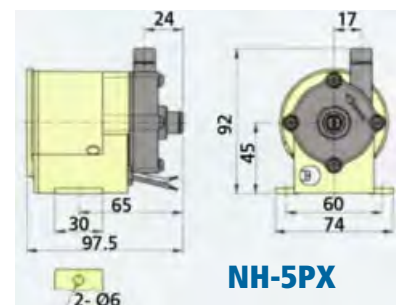
TO ORDER:

- 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



NH-5PX

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: 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)

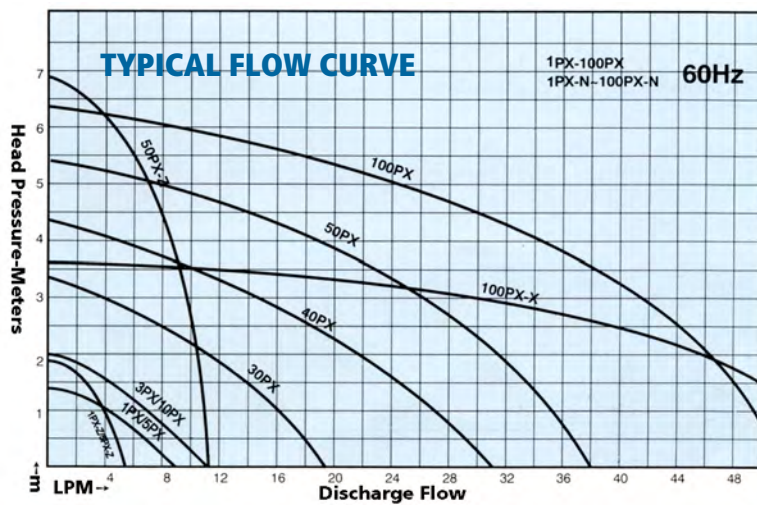
Motor Type- 110 Vac, 60Hz

Motor Case- Aluminum die cast

Magnet- Isotropic Ferrite

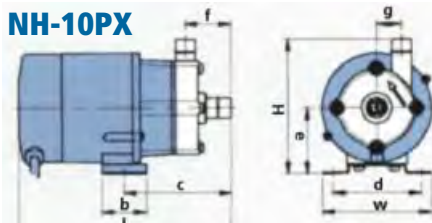
Model	Casing & Impeller	Bearing	Thrust Pad	Shaft	O Ring	Tubing Conn.(mm)	Threaded MNPT	Max Press(m)-Flow(lpm)	Nominal Speed- 3000 RPM	
									Reccomended Max Press(m)-Flow(lpm)	Max Power Cons.
NH-10PX	PPG	-	PPS	Ceramic	NBR, FKM	14	1/2"	2.0-11.5	1.0-7.5	20W
NH-30PX	PPG	Ceramic	Rulon™	Ceramic	NBR, FKM	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



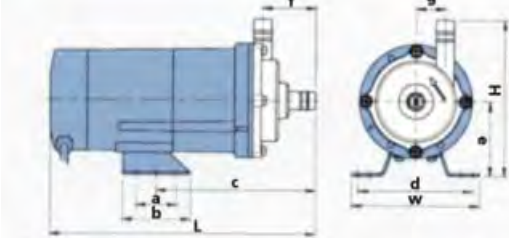
DIMENSIONS(MM)

NH-10PX



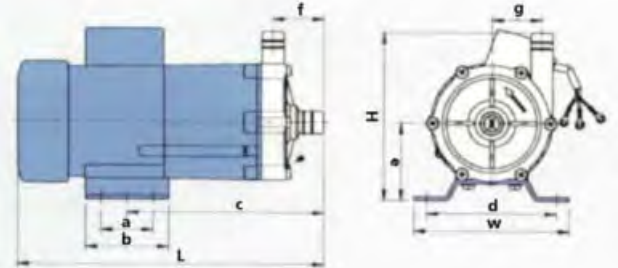
	W	H	L	b	c	d	e	f	g
10PX	74	92	145	30	73	60	45	31	17

NH-30-50PX-Z



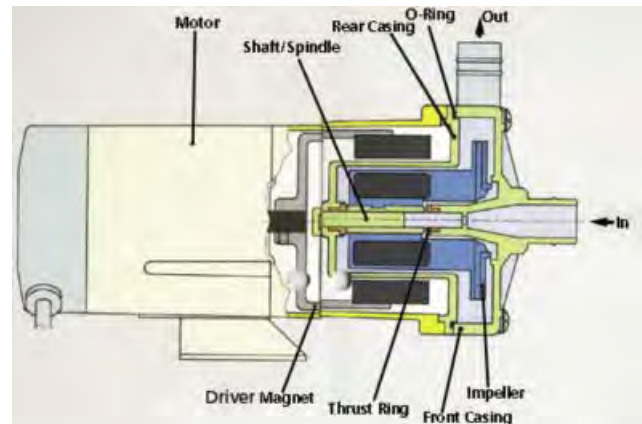
	W	H	L	a	b	c	d	e	f	g
30PX	95	115	197	30	50	117	85	55	39	21.5
40PX	95	115	210	30	50	131.5	68	55	38.5	28.5
50PX-Z	95	125	226	30	50	134	68	55	39.5	38.5

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-10PX-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)

SPECIFICATIONS

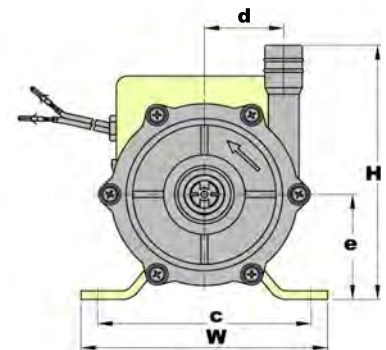
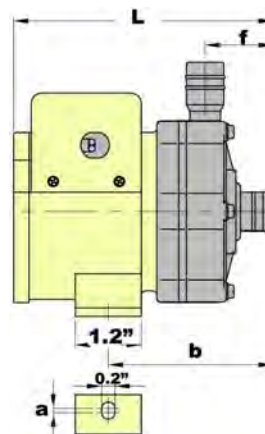
Model	Barb Tube Fitting size Outlet x Inlet (inches)	Max flow (GPM)	Max head (ft)	Motor		
				Power (V)	Output x Input (W)	Speed (rpm)
NH-10PI-Z-D	5/16 x 9/16	2.2	29	DC24V	18 x 30	5500
NH-15PI-Z-D	5/16 x 11/16	2.2	29	DC24V	20 x 45	3200
NH-20PI-Z-D	11/16 x 11/16	4.2	27	DC24V	30 x 55	3000
NH-30PI-Z-D	11/16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



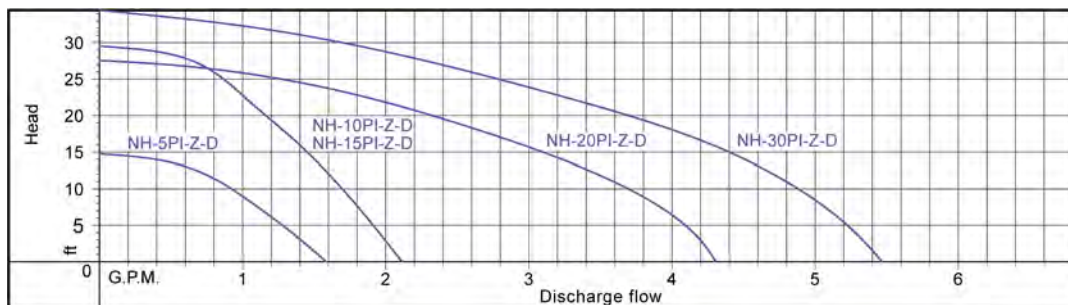
The Largest and Smallest PI-Z-D Options

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

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

(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
	3	0.001	0.002	0.003	0.004	0.005	0.007	0.01	0.02
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
	3	0.003	0.005	0.007	0.009	0.01	0.015	0.025	0.05
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
	3	0.008	0.013	0.017	0.0175	0.018	0.03	0.046	0.08

*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

The graph plots Pump Flow Rate (L/min) on the y-axis against Viscosity (SSU) on the x-axis. The y-axis ranges from 0 to 1800 in increments of 200. The x-axis ranges from 0 to 30000 in increments of 5000. The curve starts at a high flow rate of approximately 1800 L/min at 0 SSU and drops very steeply, reaching about 900 L/min at 2500 SSU. Beyond 2500 SSU, the flow rate continues to decrease but at a much slower, more linear rate, reaching approximately 300 L/min at 30000 SSU.

Viscosity (SSU)	Pump Flow Rate (L/min)
0	1800
2500	900
5000	650
10000	500
15000	420
20000	360
25000	320
30000	300

(TYPICAL TRANSFER APPLICATION CONT'D)

Friction Head = $M (0.04) \times 231$ (Total Length of Discharge Pipe, plus 2-90° elbows (8.8') plus 0.95 equiv. for gate valve normally open) $\times 0.88$ 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 and 1140 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 -

- Drive shaft broken, or shaft key sheared (direct drive) -

- Intake pipe from reservoir blocked or viscosity too heavy to prime -

- Intake air leaks (foam in oil) -

- Pump not priming -

- Fluid level too low -

System pressure too low?

- Relief valve set too low -

- Worn pump parts causing extreme internal leakage -

- Partly clogged intake strainer or restricted intake pipe -

- Defective bearing -

- Air leak at pump intake pipe joints or shaft seal -

- Drive speed too fast or too slow -

- Drive shaft misalignment -

Shaft seal leaking?

- Seal worn or damaged -

- Excessive pressure on seals -

Housing leaking?

- Pipe fitting too tight -

- Dirt in joints, housing scored -

Excessive heat?

- Discharge or pump temperature -

Rapid wear?

- Stop immediately to prevent seizure. Check direction of drive rotation (proper rotation direction is indicated by arrow on the head).

- Remove pump from mounting and determine internal damage. Replace parts if necessary.

- Drain system. Add clean fluid of proper viscosity and specifications. Filter as recommended. Check system filter for cleanliness.

- Check intake connections. Tighten securely. Squirt oil around seal. If foam in discharge line stops, seal is leaking and must be replaced.

- Loosen connection in outlet line. Bleed air until fluid flows. Check direction of rotation and suction conditions. Check for air leaks as above.

- 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).

- Adjust the relief valve, check setting with a pressure gage.

- Replace gears and take required corrective steps

- 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.

- Replace cap or head as required (bearings available only as assembled in cap and head). Inspect the shafts and replace if necessary.

- 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 pump within its recommended speed range.

- 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.

- Replace 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.

- Check pump cap for warping. Inspect cap, housing and head for flatness and replace as necessary

- Clean cap, housing and head. Carefully remove scoring by lightly Tapping or stoning

- 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.

- Inspect fluid for grit and dirt. Check pipe fittings; over tightening will warp cap and cause premature wear.

CLARK SOLUTIONS

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 ₃ COOH	All Bronze, Monel, Stainless Steel
Acid, Arsenic (Arsenic Penta-oxide)		As ₂ O ₄	All Iron, Stainless Steel
Acid, Carbolic		C ₆ H ₅ OH	All Iron
Acid, Carbolic in H ₂ O	Dil.		Standard Fitted
Acid, Carbonic in H ₂ O	Aqueous Sol.	CO ₂ H ₂ O	All Bronze
Acid, Hydrocyanic	Conc. (M.P. 105°F)	HCN	All Iron
Acid, Pyroligneous		CH ₃ CO ₃ H	All Bronze, Stainless Steel
Acid, Sulphuric, 93%	PH<4-5	H ₂ SO ₄	All Iron, Stainless Steel
Acid, Tannic (m-Digallic acid)		C ₄₄ H ₁₆ O ₉	All Bronze, Monel, Stainless Steel
Acetone		CH ₃ COCH ₃	All Iron
Alcohol, Grain (Ethanol)		CH ₃ CH ₂ OH	All Bronze
Alcohol, Wood (Methanol)		CH ₃ OH	All Bronze
Ammonia, Aqua		NH ₄ OH	All Iron
Ammonium Bicarbonate		NH ₄ HCO ₃	All Iron
Ammonium Chloride		NH ₄ Cl	All Iron, Stainless Steel
Ammonium Nitrate		NH ₄ NO ₃	All Iron, Stainless Steel
Ammonium Orthophosphate	Aqueous Sol.	(NH ₄) ₃ HPO ₄	All Iron, Stainless Steel
Ammonium Sulfate	Aqueous Sol.	(NH ₄) ₂ SO ₄	All Iron, Stainless Steel
Aniline	Aqueous Sol.	C ₆ H ₅ NH ₂	All Iron
Asphaltum	Aqueous Sol.		Standard Fitted
Barium Chloride	Aqueous Sol.	BaCl ₂	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 ₆ H ₆	All Iron
Bitterwasser		CaCl ₂	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) ₂	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 ₆ H ₅ Cl	Standard Fitted, Stainless Steel
Copperas (Green Vitriol)	(See Ferrous Sulphate)		All Iron
Creosote			All Iron
Cresol, Meta		CH ₃ C ₆ H ₄ OH	All Iron
Cyanide	(See Sod, Cyanide & Pot. Cyanide)		All Iron
Cyanogen	In Water	C ₂ N ₂ (gas)	All Iron
Diphenyl	In Alcohol	C ₆ H ₅ C ₆ H ₅	All Iron, Stainless Steel
Ethyl Acetate		CH ₃ COOC ₂ H ₅	All Iron
Ferrous Sulphate		FeSO ₄	All Iron, Stainless Steel
Furfural		C ₄ H ₃ OCHO	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) ₃ CH ₃	All Iron, Stainless Steel
Hydrogen Peroxide	Com'l	H ₂ O ₂	All Iron
Lard	Hot		All Iron
Lead, Molten			All Iron
Lime Water (Milk of Lime)		Ca(OH) ₂	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 ₃ Cl	All Iron, Stainless Steel
Methylene Chloride		CH ₂ Cl ₂	
Milk of Lime	(See Lime Water)		All Bronze Stainless Steel
Mine Water			Standard Fitted
Molasses			Standard Fitted
Naphtha			

Liquid	Conditions	Chemical Symbol	Materials Permissible
Nitre	(See Potassium Nitrate)		Standard Fitted
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			Standard Fitted
Peroxide or Hydrogen	Hot		
Petroleum Ether	(See Hydrogen Peroxide)		
Phenol	(See Benzene)		
Potash	(See Carbolic Acid)		
Potassium Bichromate	(See Potassium Carbonate)		
Potassium Carbonate	Aqueous Sol.	$K_2Cr_2O_7$	All Iron
Potassium Chlorate	Aqueous Sol.	K_2CO_3	All Iron
Potassium Chloride	Aqueous Sol.	$KClO_3$	All Iron, Stainless Steel
Potassium Cyanide	Aqueous Sol.	KCl	All Bronze, Stainless Steel
Potassium Hydroxide	Aqueous Sol.	KCN	All Iron
Potassium Nitrate	Aqueous Sol.	KOH	All Iron, Stainless Steel
Potassium Sulfate	Aqueous Sol.	KNO_3	All Iron, Stainless Steel
Pyridine		K_2SO_4	All Iron, All Bronze, Stainless Steel
Salammoniac			All Iron
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_2CO_3	All Iron
Sodium Bicarbonate		$NaHCO_3$	All Iron, Stainless Steel
Sodium Chloride	(See Brines)		
Sodium Cyanide	Aqueous Sol.	$NaCN$	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_2S	All Iron, All Bronze, Stainless Steel
Sodium Sulfite	Aqueous Sol.	Na_2SO_3	All Bronze, Stainless Steel
Starch	Aqueous Sol.		Standard Fitted
Strontium Nitrate		$Sr(NO_3)_2$	All Iron, Stainless Steel
Sugar			All Bronze
Sulfur	In Water	S	All Iron, All Bronze
Sulfur Chloride	Cold	S_2Cl_2	All Iron
Syrup			All Bronze
Tanning Liquors (veg.)			All Bronze, Stainless Steel
Tar			All Iron
Tar and Ammonia			All Iron
Tetraethyl Lead	Aqueous Sol.	$Pb(C_2H_5)_4$	All Iron
Toluene (toluol)		$C_6H_5CH_3$	All Iron, Standard Fitted
Trichloroethylene		$CHCl_3$	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:

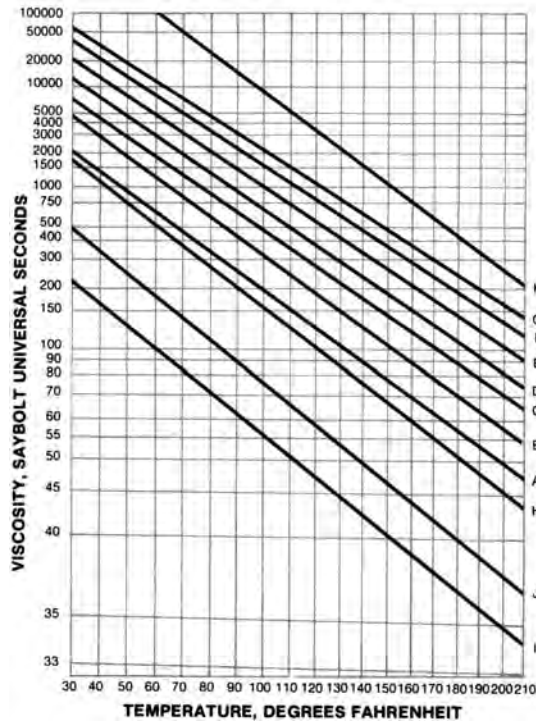
All Iron pumps are constructed with steel gears, iron casings, and iron bearings.

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)

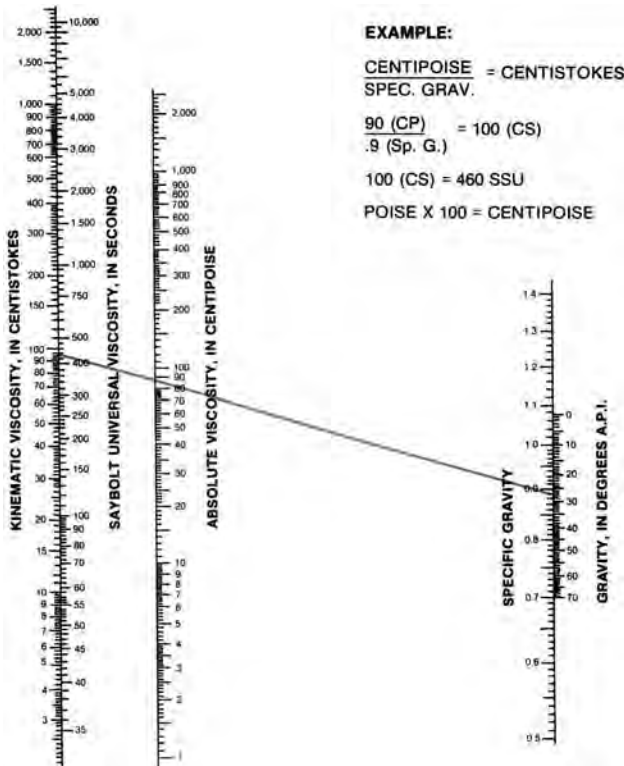
Curves for S.A.E. numbered oils show average viscosities based on Dean and Davis viscosity index of 100.

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

Curve for Light Hydraulic Oil is based on a commonly used viscosity.

$^{\circ}\text{Celsius} = (^{\circ}\text{Fahrenheit} - 32) \times 5/9$

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:

$\text{H.P.} = \frac{W \times H}{33,000 \times E}$ or $0.000584 \frac{Q \times P}{E}$, 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

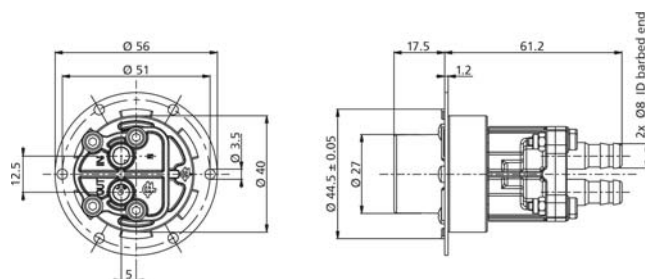
The DGM09 Series magnet drive gear pumps derive from the well established mag drive MG200 Series. Built to handle clean water and relatively viscous fluids at low pressure, the DGM09 Series pump-motor unit has low pulsation and is capable of handling fluids at a maximum temperature of 95°C (203°F).

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)



DIMENSIONS (MM)

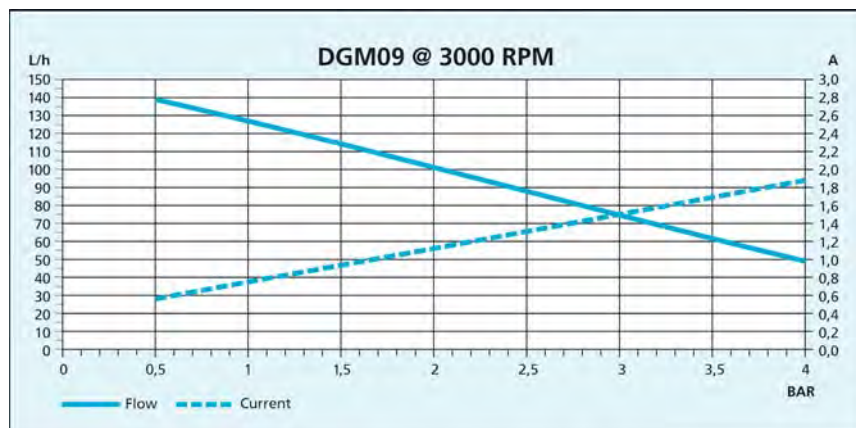


TYPICAL APPLICATIONS

- Water purification
- Laser cooling
- Water circulation
- Condensation removal
- Low pressure carbonation



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

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.

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)



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



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

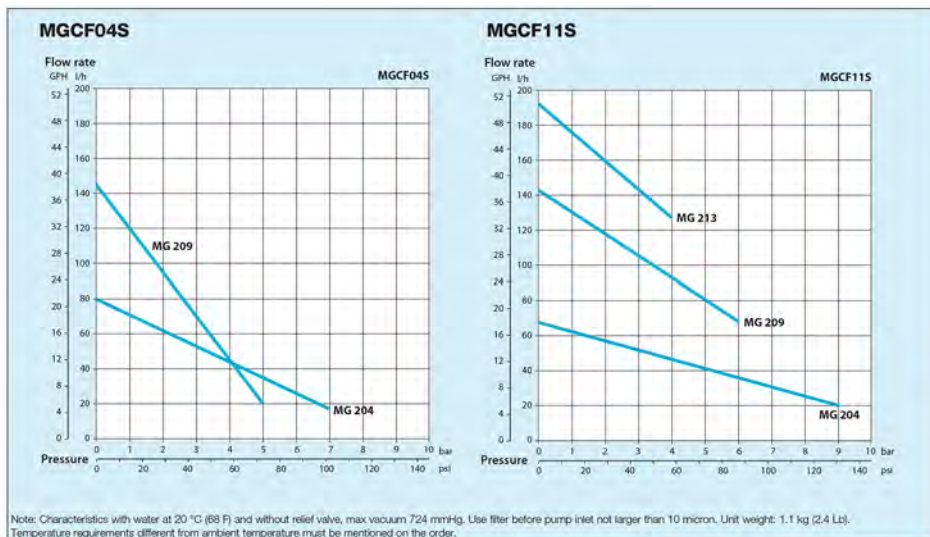


Fig. 1

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

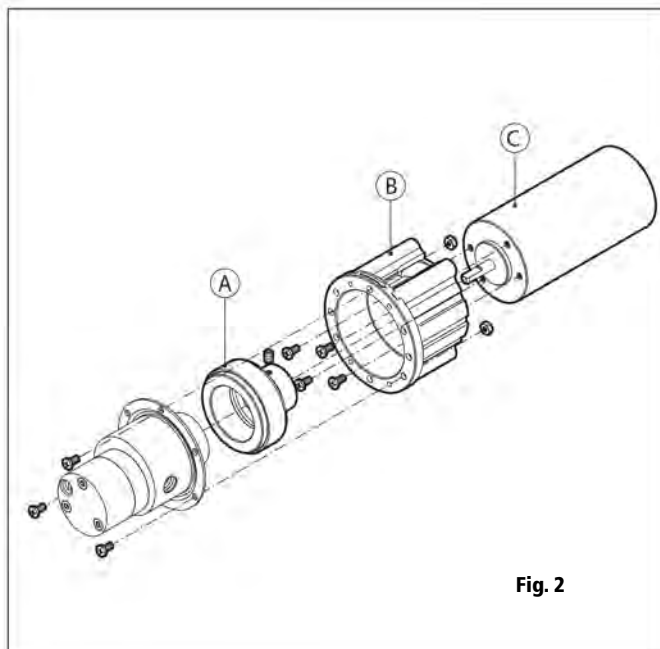
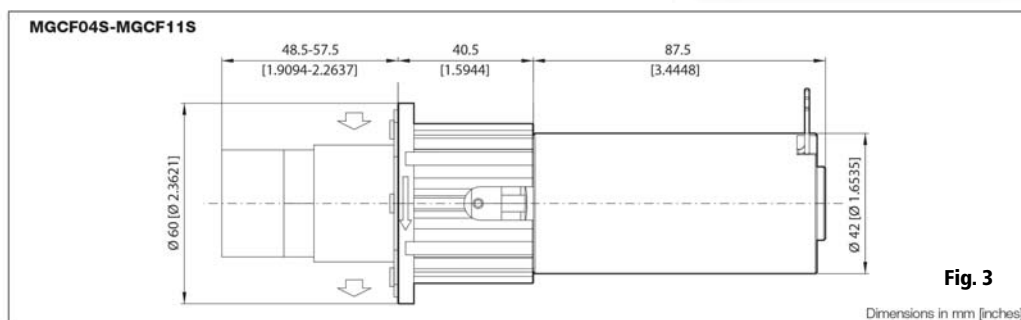


Fig. 2

DIMENSIONS



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

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 $\pm 5\%$ 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

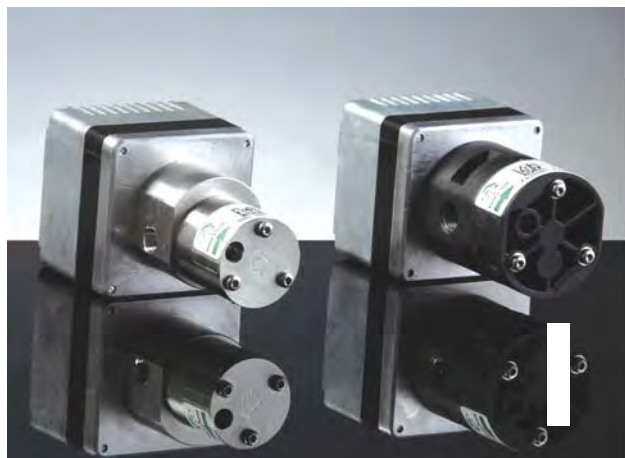
Max power: 50 W

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



APPLICATIONS

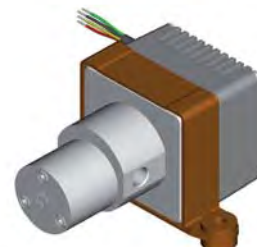
- Medical and surgical equipment
- Hemodialysis apparatus
- Laser apparatus
- Lubrication
- Ink-jet printing systems
- Cooling systems
- Laboratory instrumentation
- Water purification and ultra-filtration
- Sampling
- Food processing equipment



MOUNTING



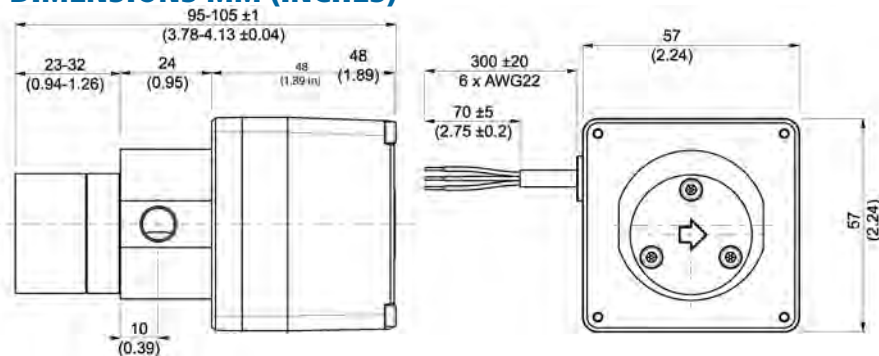
Front Flange Kit 94-83-01



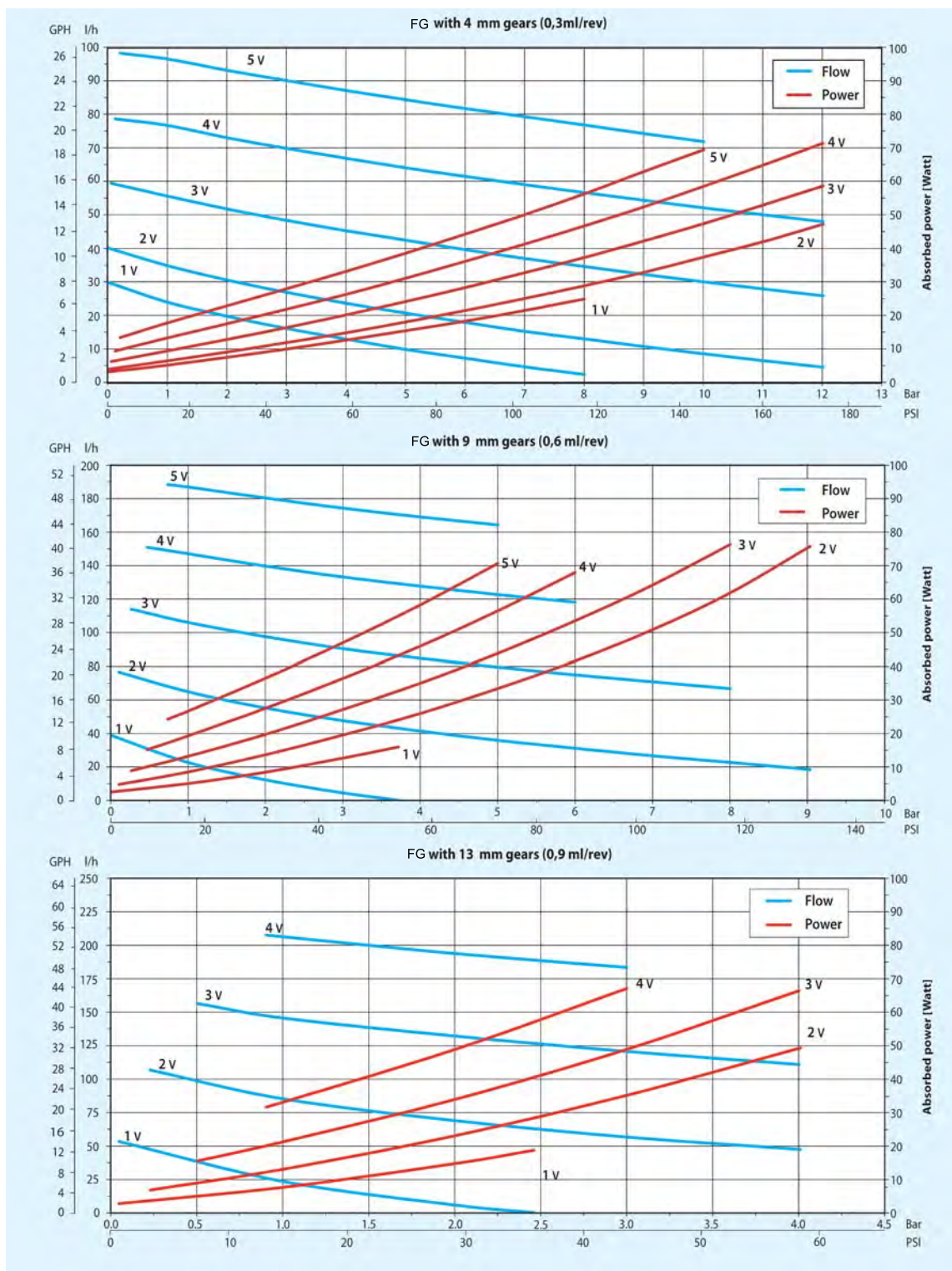
Metal Bracket 94-83-02

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		

DIMENSIONS MM (INCHES)



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.



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.

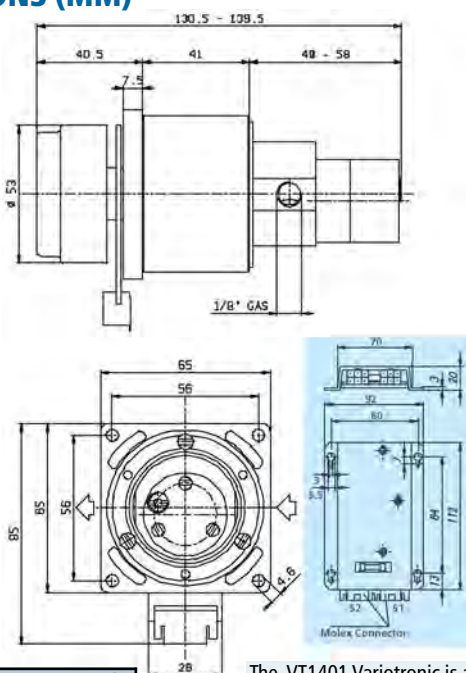
In operation the MG 200 Series pumps are noiseless, pulsation-free and capable of handling relatively hot liquids i.e. 120°C (248°F) at a low coefficient of expansion. The principle of the magnet drive comprises an inner PEEK encapsulated magnet embodied in the pump, connected to the driving gear and 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

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.

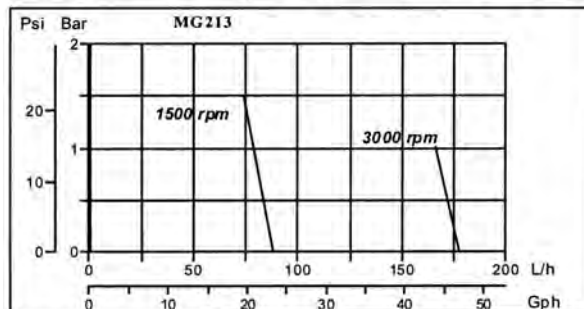
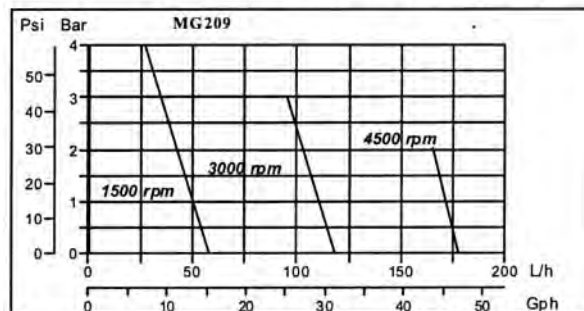
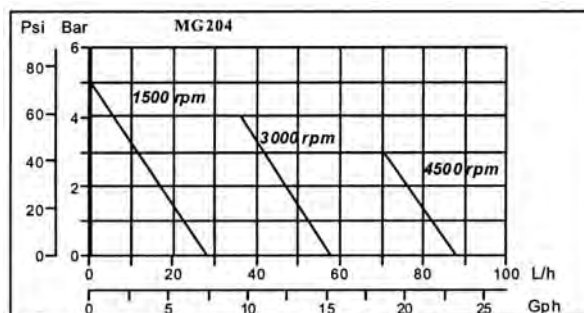
ORDERING INFORMATION

- 1) Order motor assembly separately- (MGBR1)
- 2) Order optional Variotronic controller- (VT1401)
- 3) Build Pump Part Number From Table- (MG209XP017)

Model	Gear Width	Housing	Gear/Bushing	Relief Valve	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

TYPICAL APPLICATIONS

- Medical equipment & Lab instruments
- Lubrication
- Sampling
- Cooling systems & Lasers
- Ink-jet printing systems



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.

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)



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



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

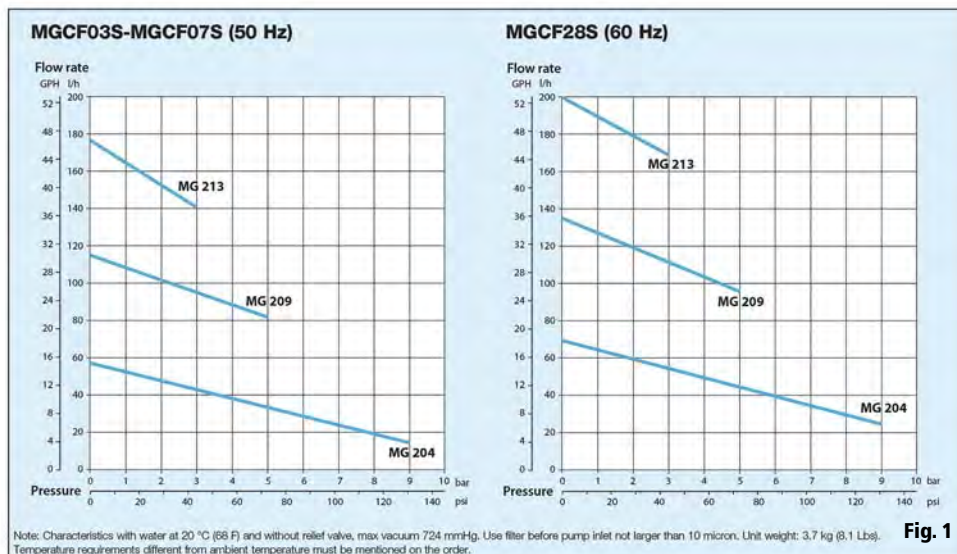


Table 1 AC Motor Coupling Components			
Item	Description	Note	Order Code
M56B14 Motors			
A	Ferrite Drive Magnet	For 9 mm bore	MGA09S
A+B	Complete Adaptor	For M56B14 Motor	MGBF56S
A+B+C	Complete Motor Assembly	See Table Below	MGCF03S MGCF07S MGCF28S
NEMA 56C Frame Motor Adaptor			
A	Ferrite Drive Magnet	For 5/8 bore	MGA5BC
A+B	Complete Adaptor	For NEMA 56C	95-05-08

Table 2	Motor Assembly		
	MGCF03S	MGCF07S	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

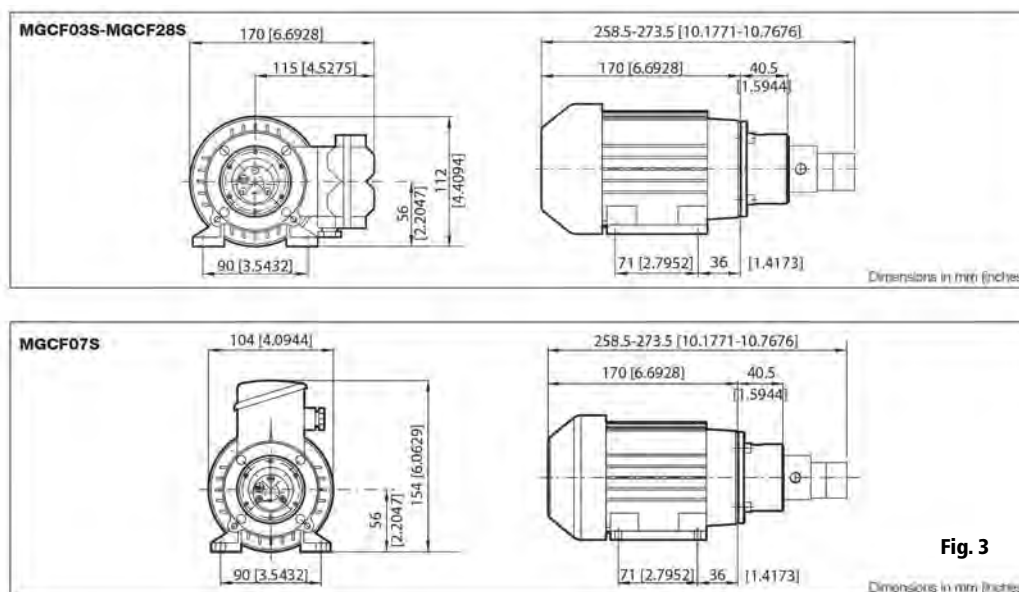


Fig. 3

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

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 viscosity fluids and a wider offer of materials to suit most applications, from the food to the industrial 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.

SPECIFICATIONS

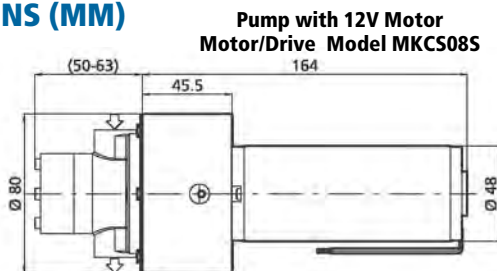
Pump Housing Material: 316 SS

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

DIMENSIONS (MM)



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



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.

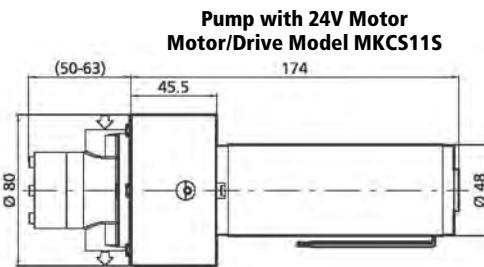
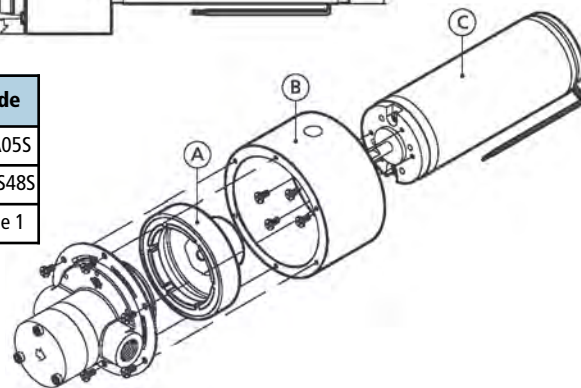


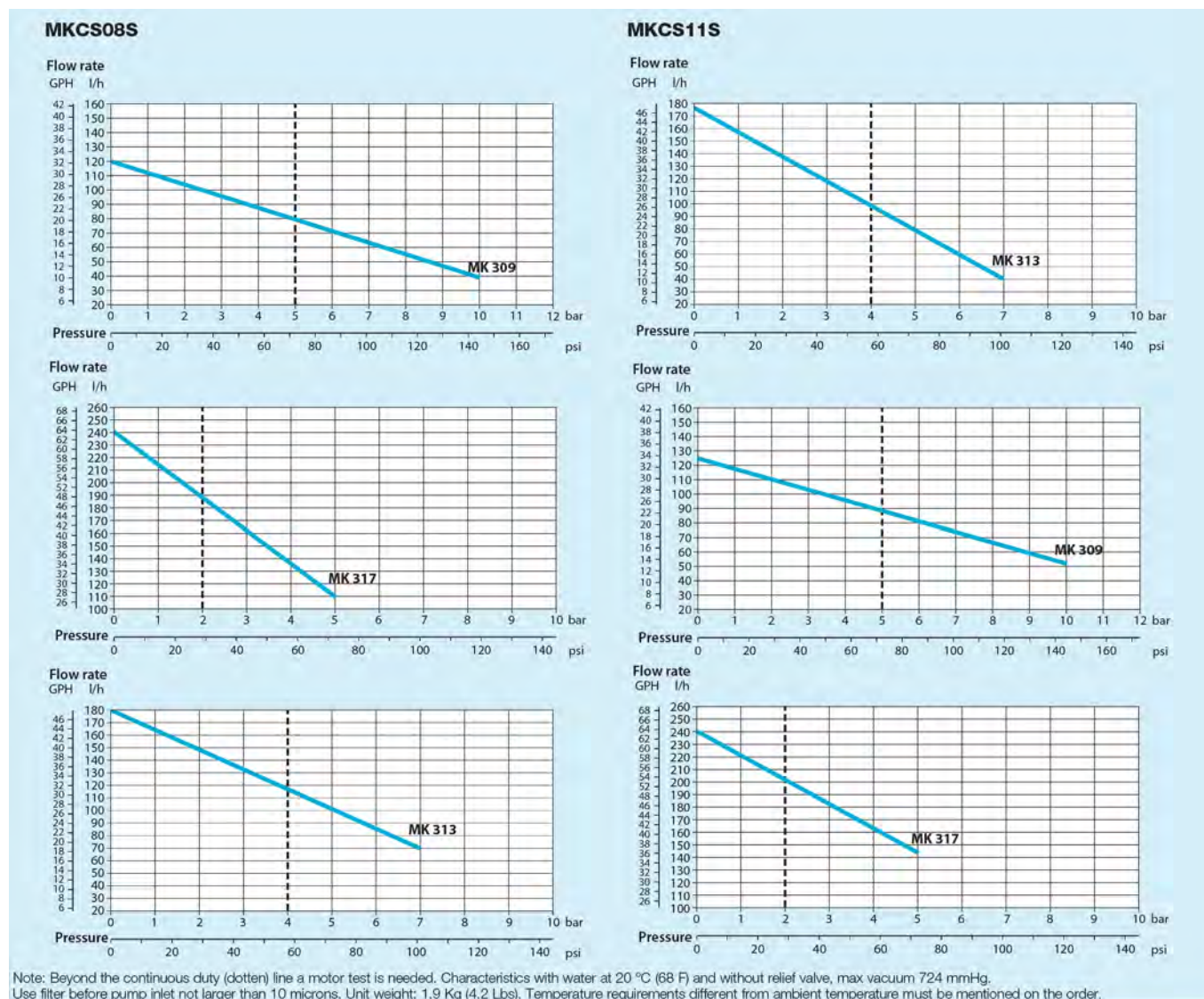
Table 1 Drive, Adapter & Motor Assembly

Model includes Drive Magnet (A), Motor Adapter (B) & Motor (C)	Model MKCS085	Model MKCS115
Voltage (V)	12 DC	24DC
Rated Speed (rpm)	3,050	3,150
Current Consumption (A)	3.4	2.6
Output Power (W/HP)	32/0.0429	49.5/0.0664
Weight (g/lb)	910/2.1	980/2.16

Description	Code
A Drive Magnet for 5 mm Drive	MKA05S
B Motor adapter	MKB548S
C 12 or 24 VDC Motor	Table 1



FLOW CURVES



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 chosen 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

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 available 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.

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



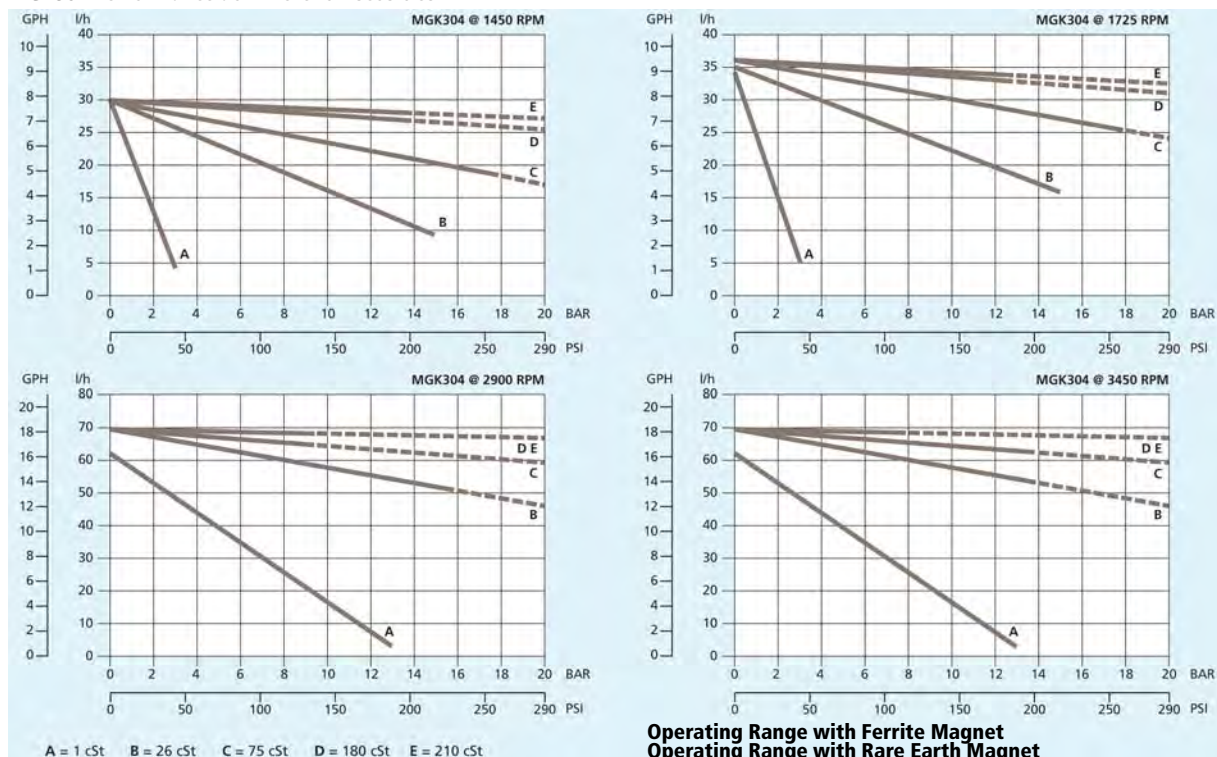
MGK Without Motor

APPLICATIONS

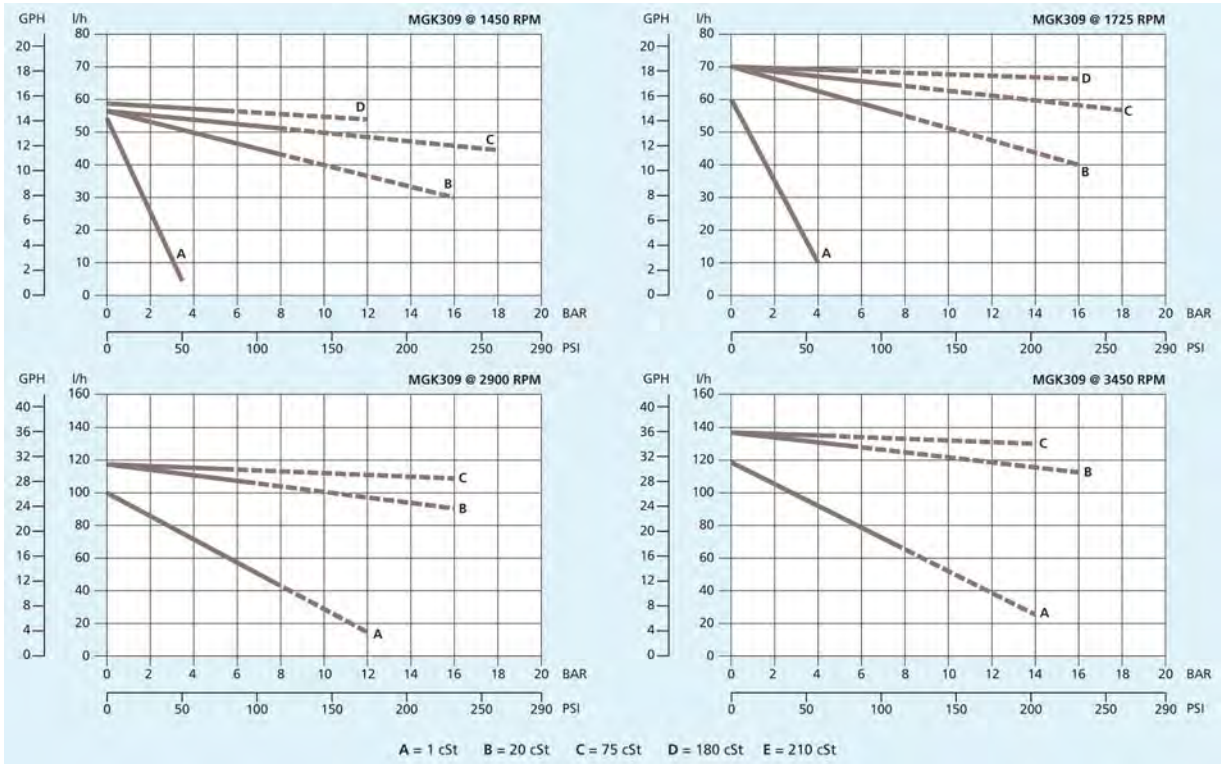
- Medical and surgical equipment
- Hemodialysis apparatus
- Laser apparatus
- Lubrication
- Ink-jet printing systems
- Cooling systems
- Laboratory instrumentation
- Water purification and ultra-filtration
- Sampling
- Food processing equipment



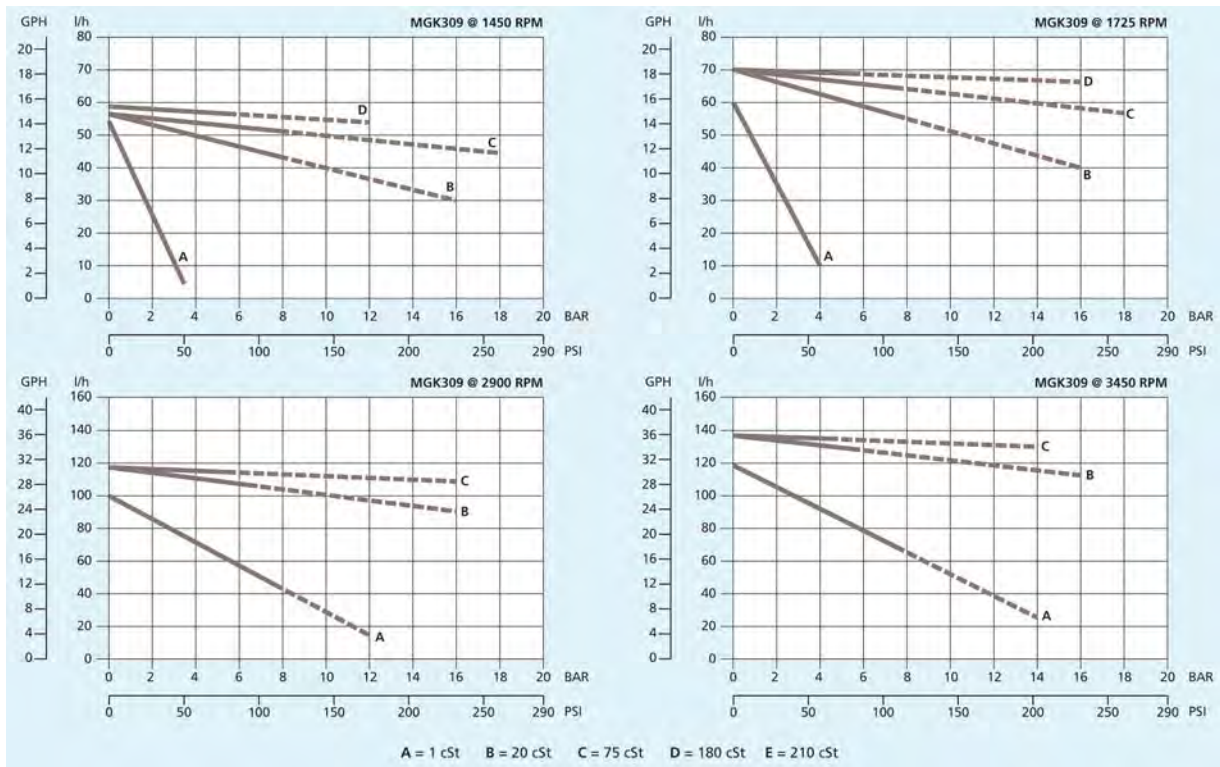
MGK304 Performance at Different Viscosities



MGK309 Performance at Different Viscosities

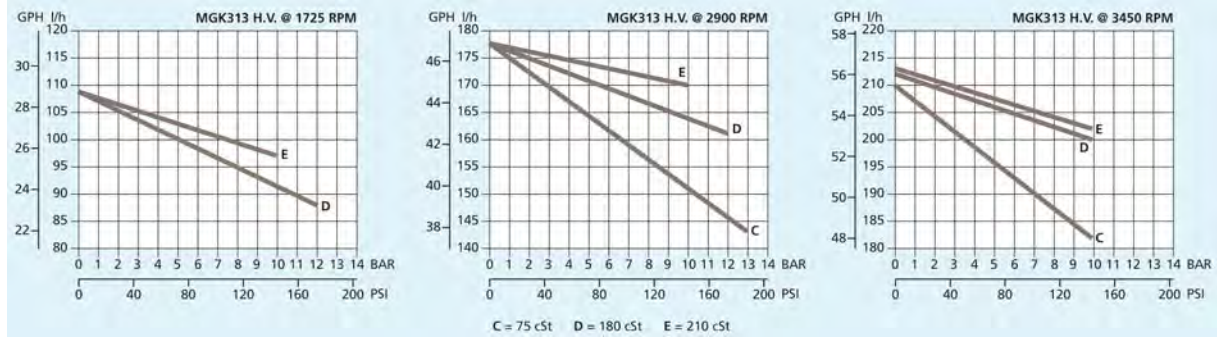


MGK313 Performance at Different Viscosities

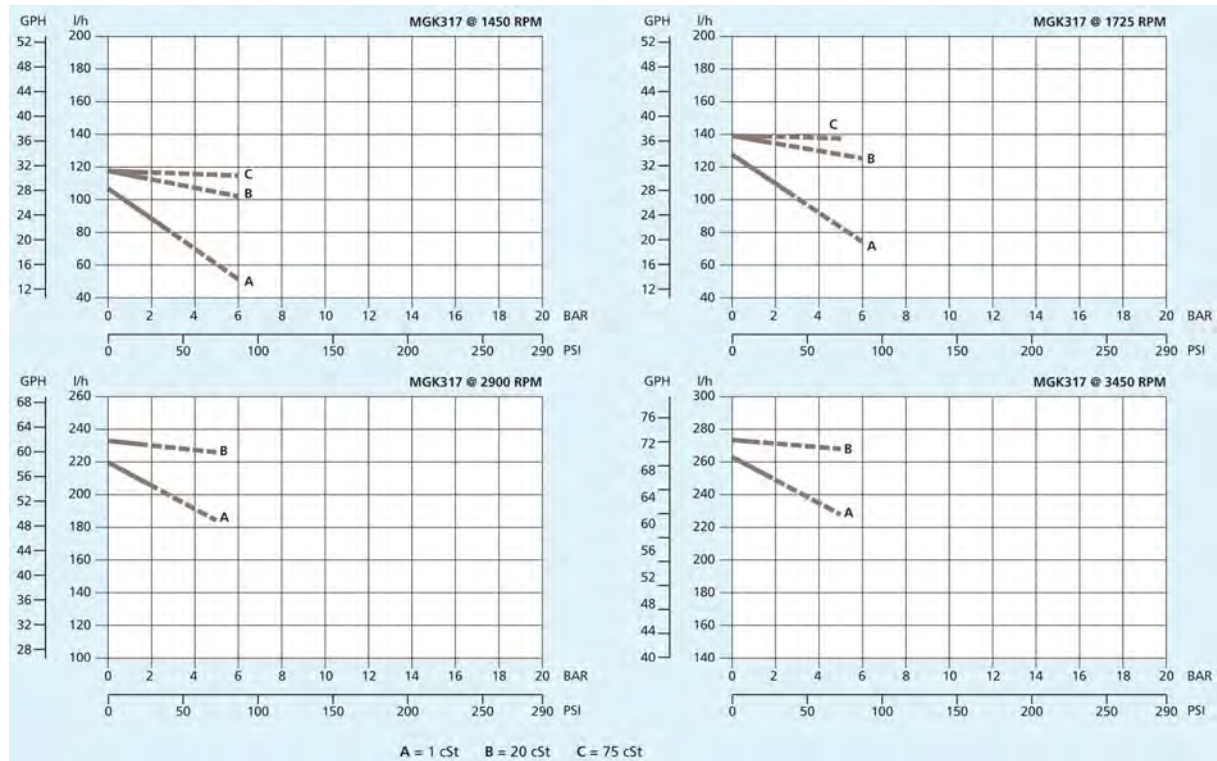


————— Operating Range with Ferrite Magnet
 - - - - - Operating Range with Rare Earth Magnet

MGK313 High Viscosity Performance at Different Viscosities

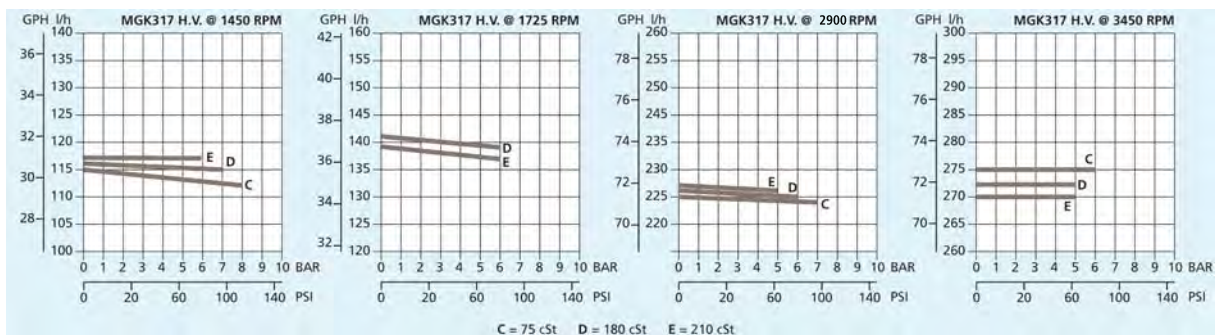


MGK317 Performance at Different Viscosities



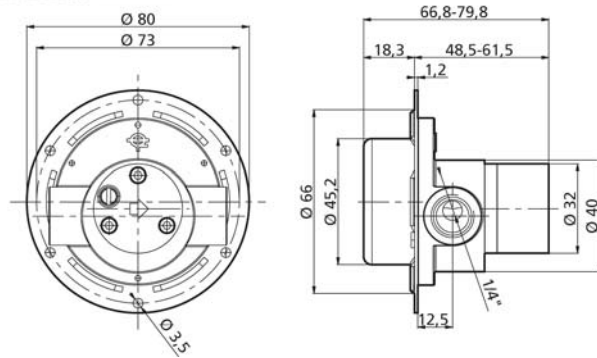
————— Operating Range with Ferrite Magnet
 - - - - - Operating Range with Rare Earth Magnet

MGK317 High Viscosity Performance at Different Viscosities

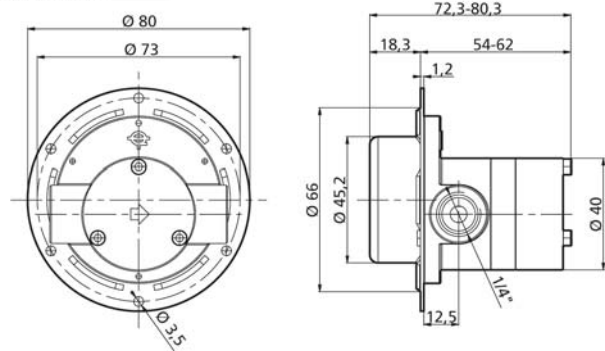


DIMENSIONS (MM) PUMP WITHOUT MOTOR

MGK200



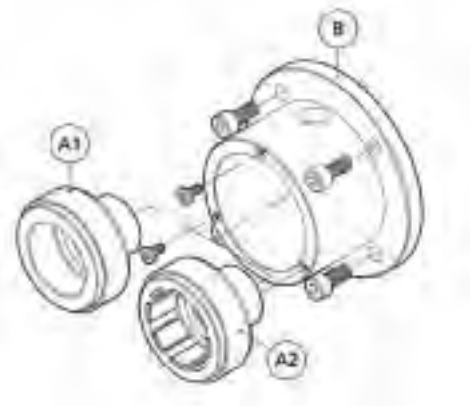
MGK300



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)
MKB556S	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)
MKB563S	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 chosen 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

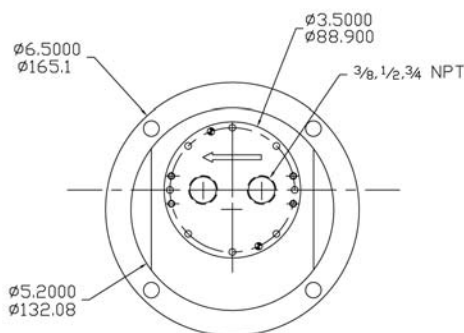
Ports: 3/8", 1/2" or 3/4" NPT; generally 3/8" NPT to 4.5 gpm, 1/2" NPT above 5 gpm, 3/4" NPT for high viscosity fluids. Consult us.

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		

DIMENSIONS (INCHES,MM)

PUMP/MAGNETIC COUPLING/56C FRAME FLANGE



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

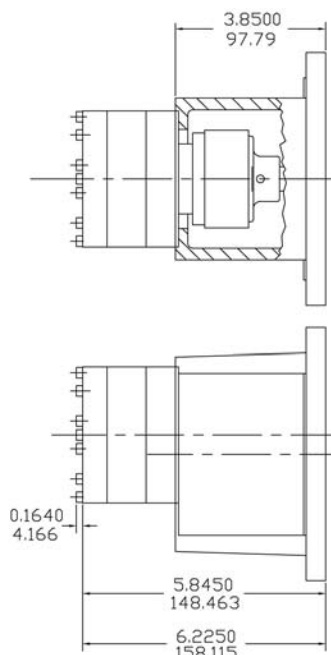
Max. Speed: 4,000 rpm

Max Static Pressure: 500 psi (35 bar)

Viscosity Range: 0.3 to 1000 Cps

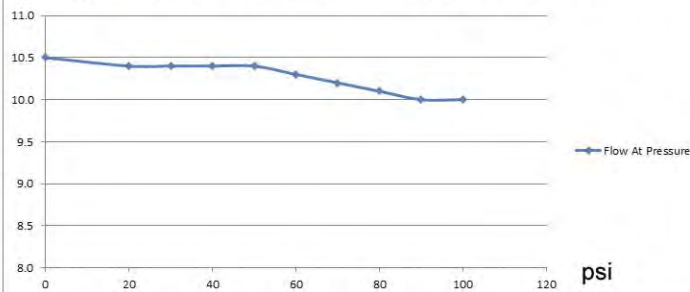
Max Vacuum: 28 in. Hg (724 mm Hg)

Motor Interface: 56C Frame Flange

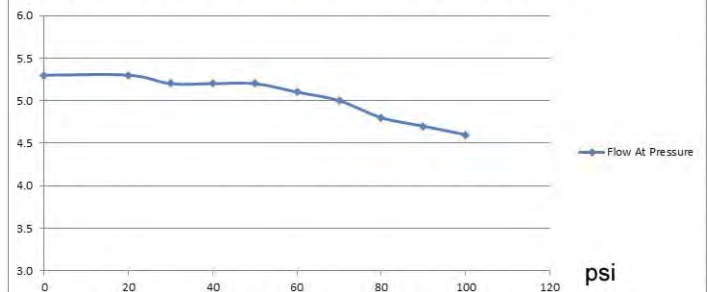


PUMP MODEL SELECTION/FLOW CURVES

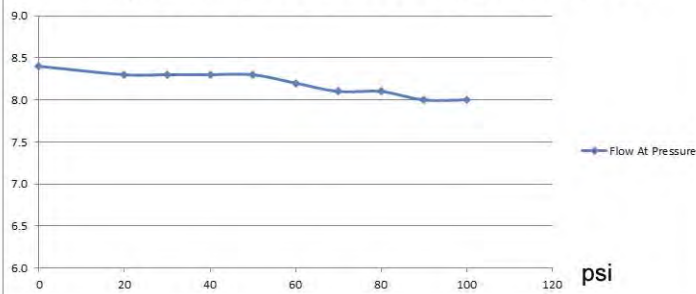
Typical Flow GPM At Pressure MTC10.0 @ 20C 3450 RPM



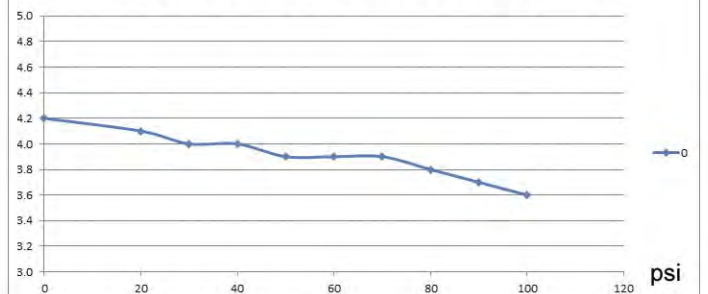
Typical Flow GPM At Pressure MTC10.0 @ 20C 1725 RPM



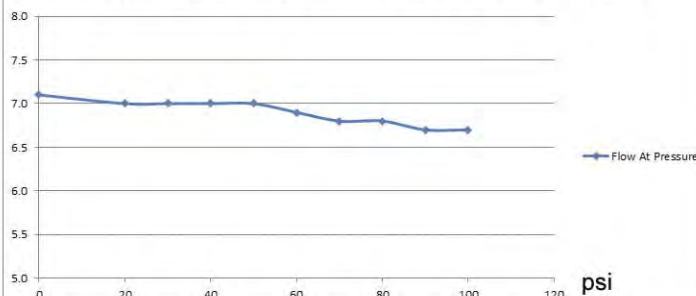
Typical Flow GPM At Pressure MTC8.0 @ 20C 3450 RPM



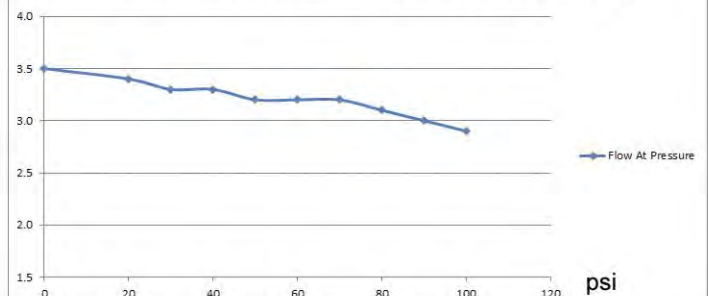
Typical Flow GPM At Pressure MTC8.0 @ 20C 1725 RPM



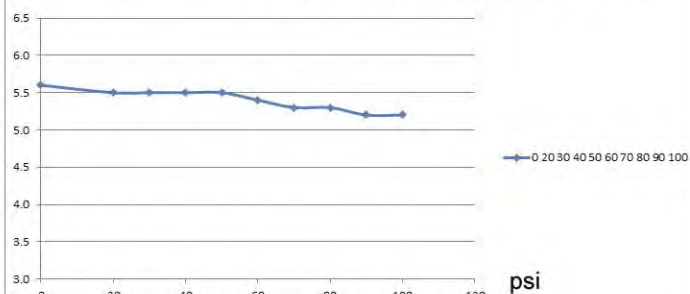
Typical Flow GPM At Pressure MTC6.5 @ 20C 3450 RPM



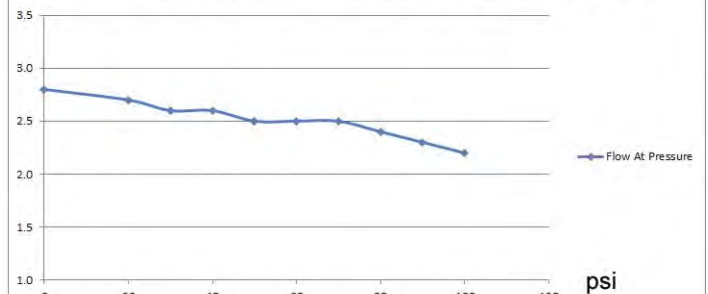
Typical Flow GPM At Pressure MTC6.5 @ 20C 1725 RPM



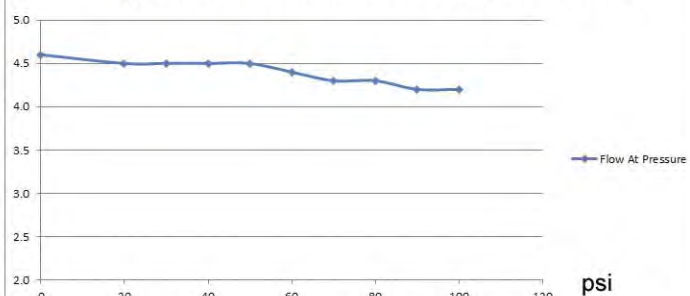
Typical Flow GPM At Pressure MTC5.5 @ 20C 3450 RPM



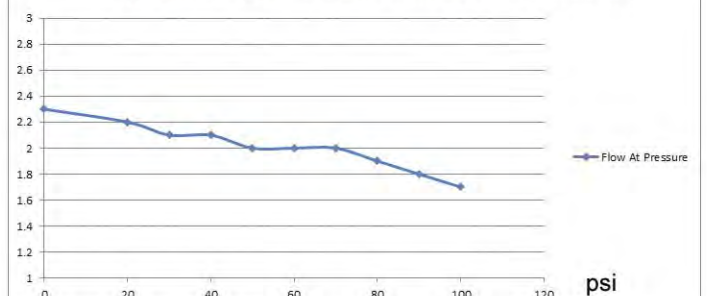
Typical Flow GPM At Pressure MTC5.5 @ 20C 1725 RPM



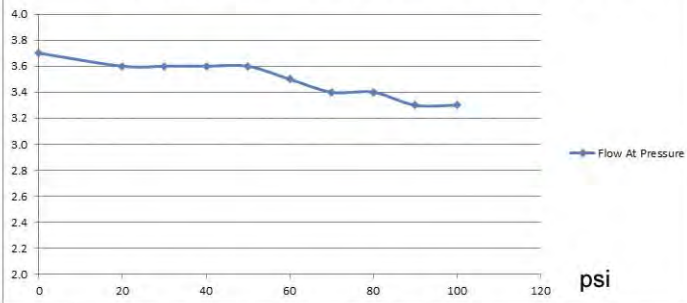
Typical Flow GPM At Pressure MTC4.5 @ 20C 3450 RPM



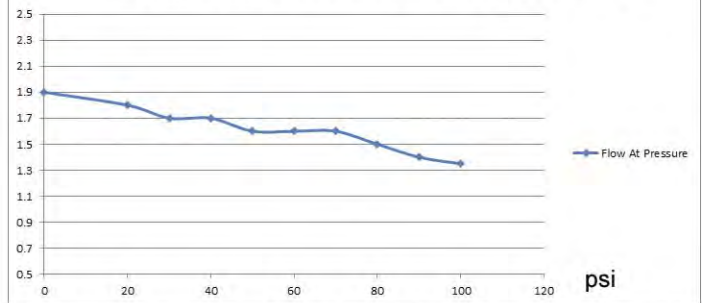
Typical Flow GPM At Pressure MTC4.5 @ 20C 1725 RPM



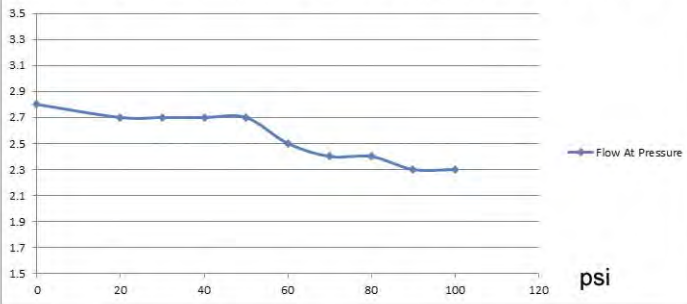
Typical Flow GPM At Pressure MTC3.5 @ 20C 3450 RPM



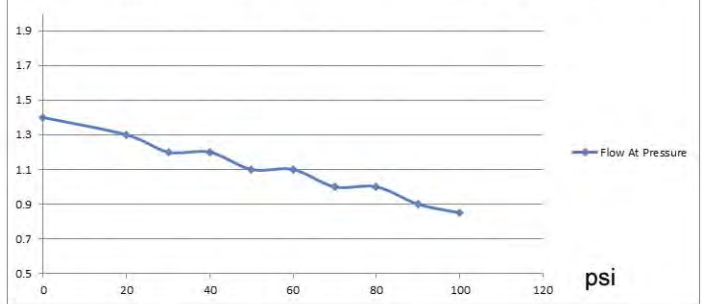
Typical Flow GPM At Pressure MTC3.5 @ 20C 1725 RPM



Typical Flow GPM At Pressure MTC2.5 @ 20C 3450 RPM



Typical Flow GPM At Pressure MTC2.5 @ 20C 1725 RPM



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.

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)

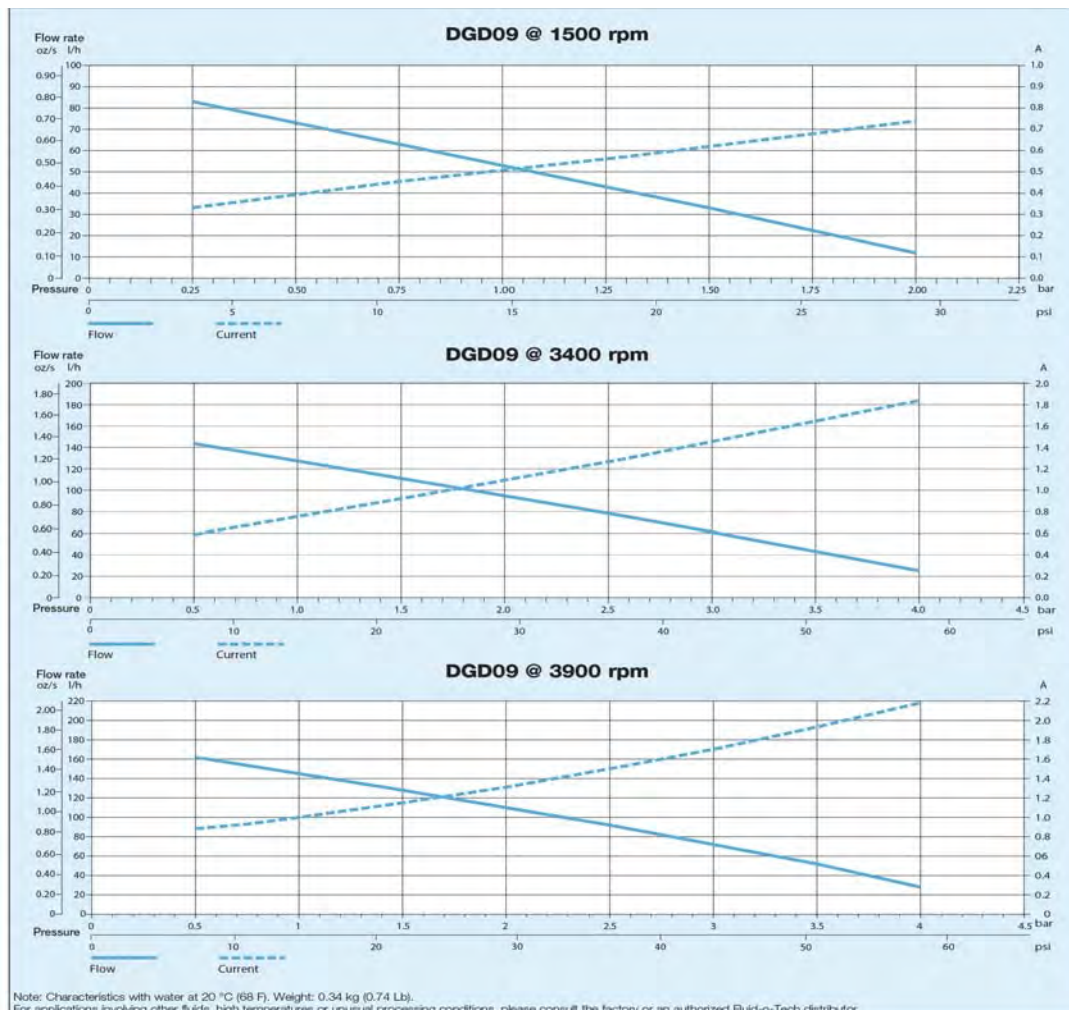


TYPICAL APPLICATIONS

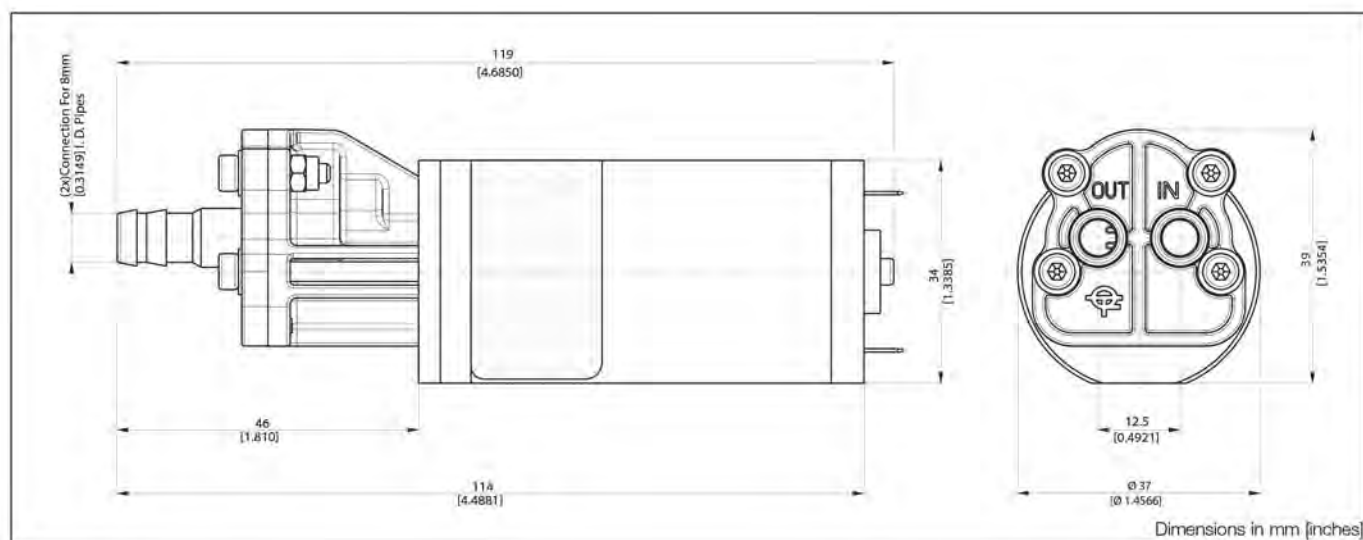
- Water purification
- Laser cooling
- Water circulation
- Condensation removal
- Spraying
- Syrup Dispensing



PERFORMANCE (PRESSURE, FLOW, CURRENT CONSUMPTION)



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

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 maintained via a built-in micro-processor 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.

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

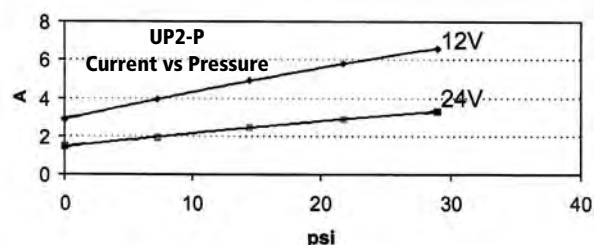
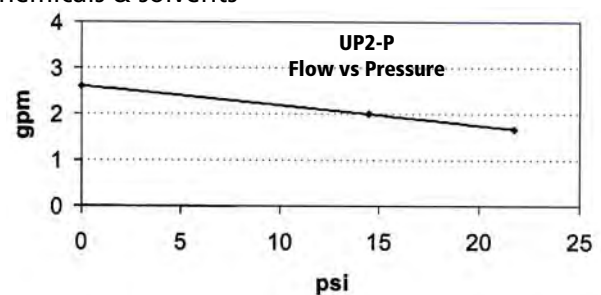
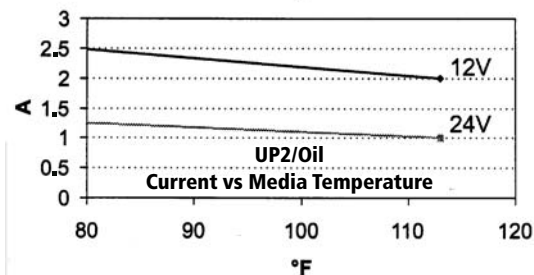
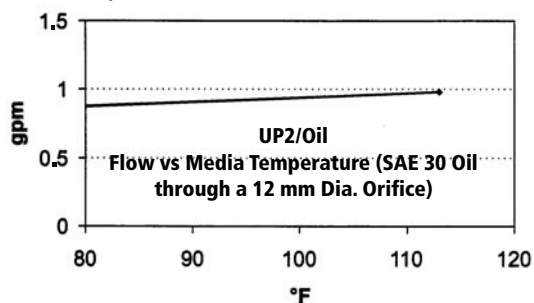


UP2/Oil & UP2-P

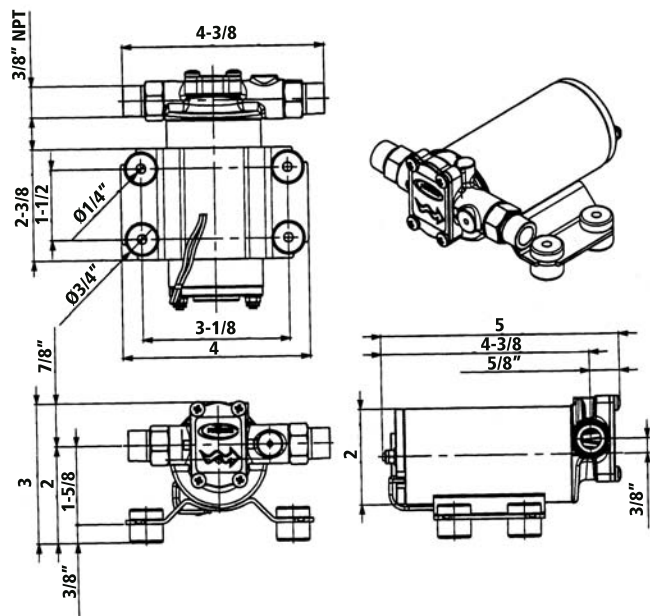


UP2/Oil & UP2-P With Pressure Control

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



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 contains particles.

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 maintained 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.

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

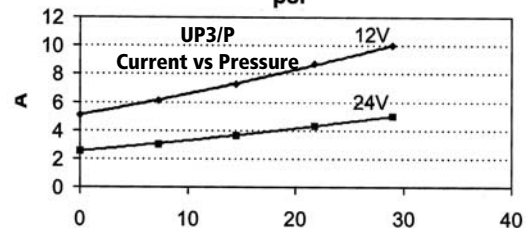
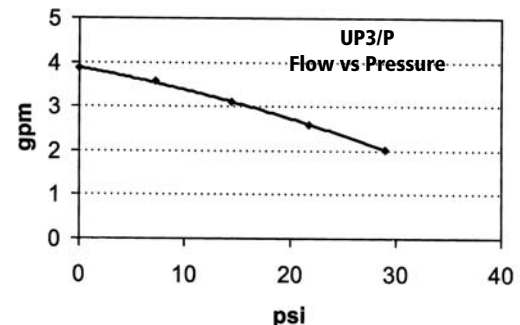
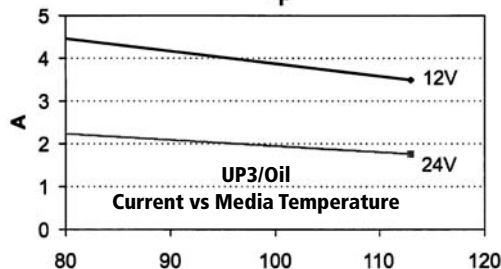
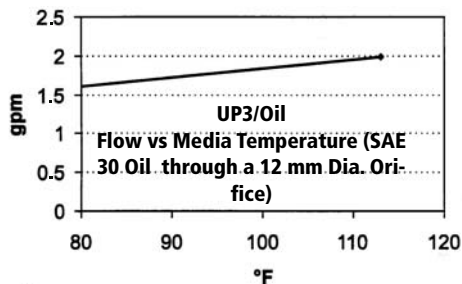


UP3/Oil & UP3/P

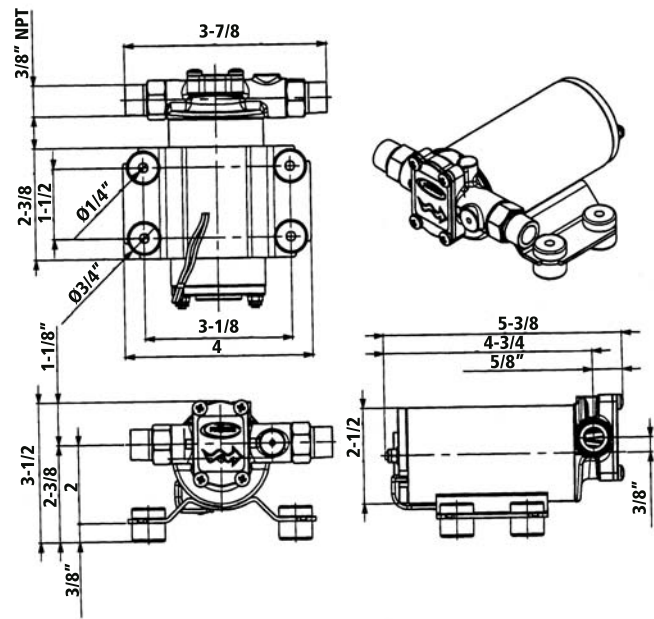


UP3/Oil & UP3/P With Pressure Control

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



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 contains particles.

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.

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

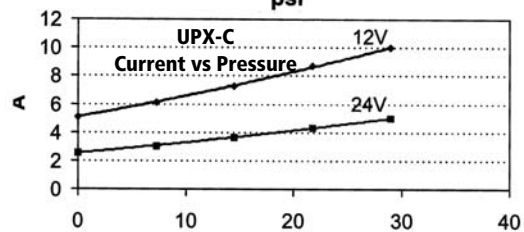
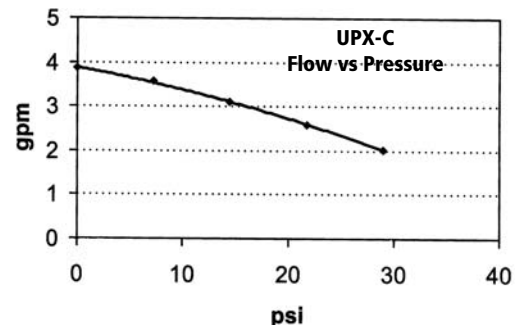
Seal: Perfluoroelastomer

Suitable Fluid Media: Fresh water and fluids (max. 40°C, 104°F), which are compatible with stainless steel, PTFE and perfluoroelastomer seals.

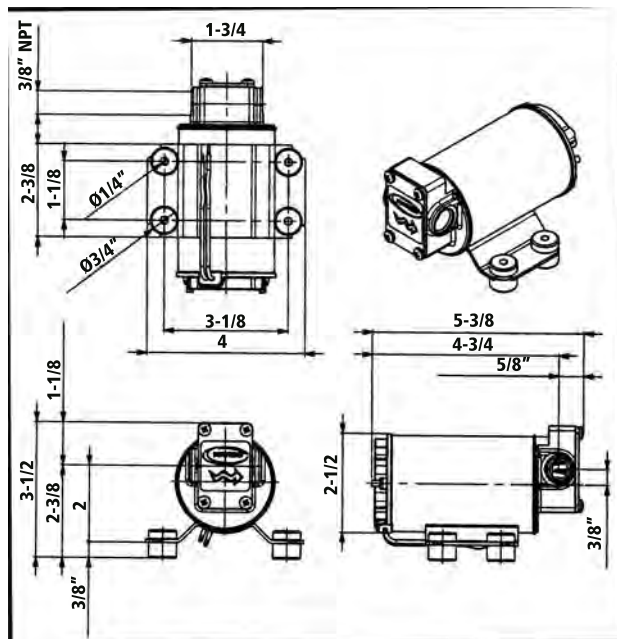
Unsuitable Fluid Media (UP2/Oil & UP2-P): DO NOT USE for Gasoline, flammable liquids with PM<131°F, liquids with viscosity> 20 cSt, food products, media not compatible with wetted materials.



UPX-C



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 contains 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-PN 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 fuse 12 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:

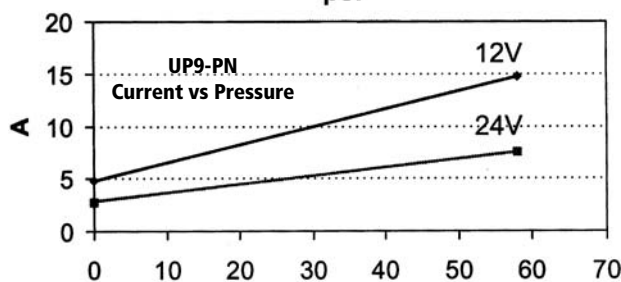
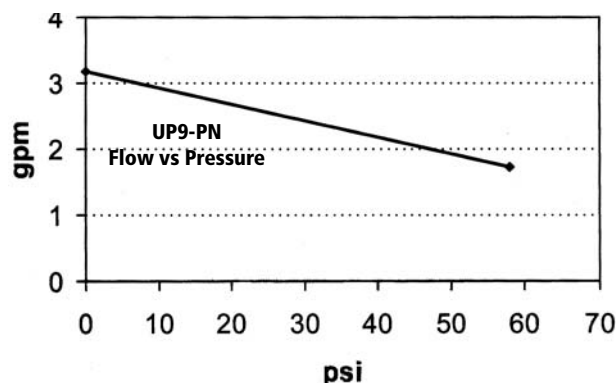
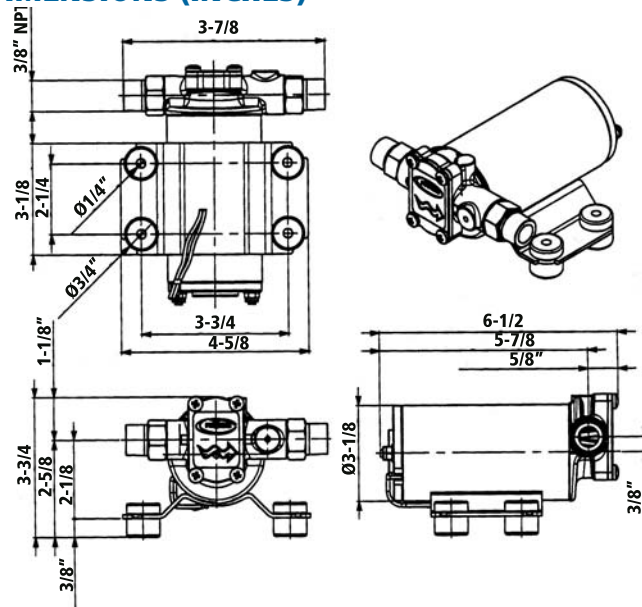
Fresh Water (max. 85°C, 185°F), salt water (max. 40°C, 104°F & diesel fuel with viscosity between 2 & 5.35 cSt to 37.8°C, 100°F; minimum flashpoint (PM): 55°C, 131°F

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 contains particles.

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 maintained 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.

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 fuse 12 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; 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

* A model with lower operating speed is available for lubricating oils and viscous liquids, consult factory.

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 contains particles.

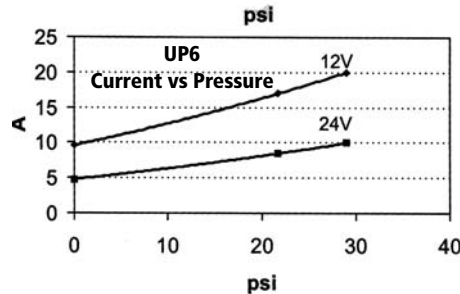
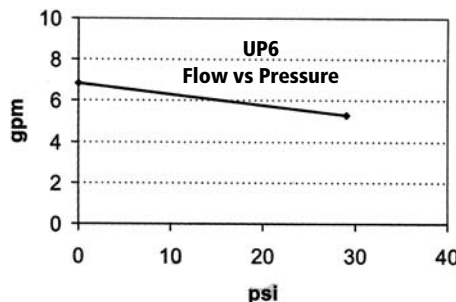
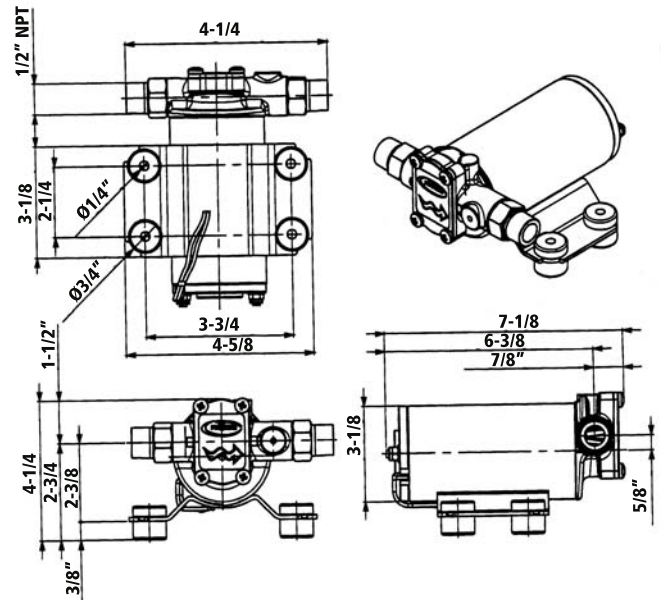


UP6



UP6E

DIMENSIONS (INCHES)



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 maintained 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 fuse 12 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.

ORDERING INFORMATION

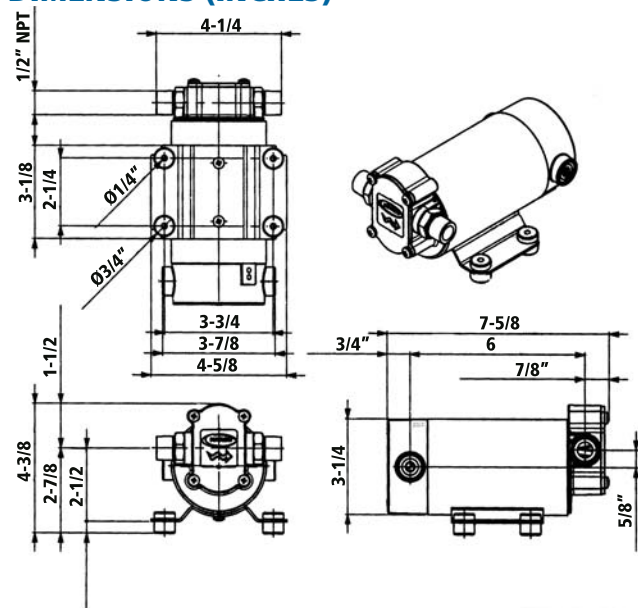
ABC

Example: UP1224V

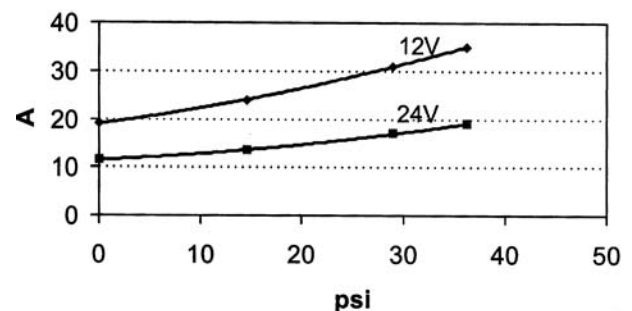
A Model	B Voltage	C Options
UP12	12V= 12 VDC 24V= 24 VDC	- None E= Electronic Pressure Control, Specify Pressure Setpoint

Note: A 250-400 micron filter is recommended for applications where the fluid media contains particles.

DIMENSIONS (INCHES)



UP12
Flow vs Pressure



MARCO

UP14 Gear Pumps for Water, Antifreeze & Diesel Fuel

12 or 24 VDC, Flow to 12.0 GPM, Pressure to 29 PSI

DESCRIPTION

Model UP14 is a self-priming, compact, powerful, 12 or 24 VDC electric gear pump. UP14 is constructed of helical bronze gears or PTFE gears, nickel-plated brass body and stainless steel shaft.

Depending on the model, use UP14 for transfer of fresh water, diesel fuel, antifreeze and other compatible media.

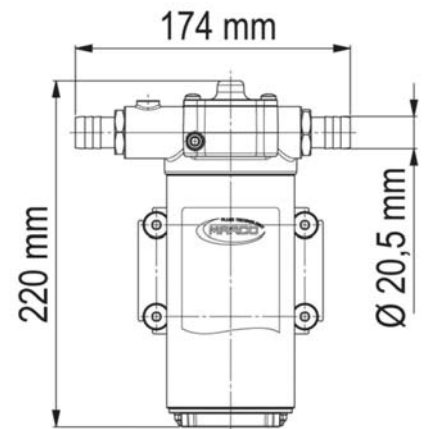
Model types include:

- UP14 Bronze Gear Pump: Main applications are diesel fuel, antifreeze, water & lightweight oils
- UP14/Oil Bronze Gear Pump: Main applications are engine lubricating fluids & draining engine sumps.
- UP14-P Gear Pump with PTFE Gears: Main applications are bilge service and transfer of water.



General Specifications										
P/N	Model	Voltage (VDC)	Current Consum.	Fuse (A)	Self-Prime (Feet)	Pressure (PSI)	Flow Rate (gpm)	Hose Conn.	Motor Power (W)	Weight (lb)
16450012	UP14	12	16	30	13.1	29	12.2	3/4" BSP, Tubing adapters supplied	400	11.7
16450013	UP14	24	8	20	13.1	29	12.2		400	11.7
16452012	UP14/Oil	12	14	20	6.6	29	4.84		260	11.7
16452013	UP14/Oil	24	7	15	6.6	29	4.84		260	11.7
16450212	UP14-P	12	16	30	13.1	29	12.2		400	11
16450213	UP14-P	24	8	20	13.1	29	12.2		400	11

DIMENSIONS

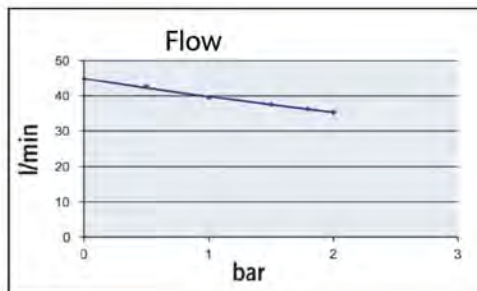
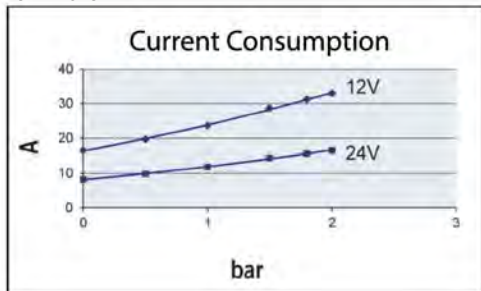


Operating Cycle- Intermittent but can run continuous so long as:

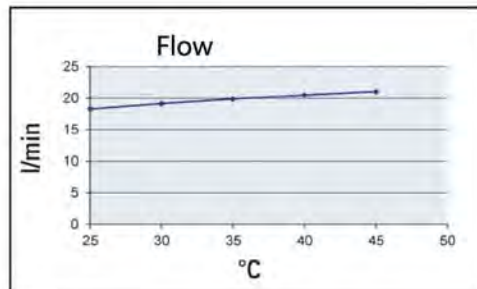
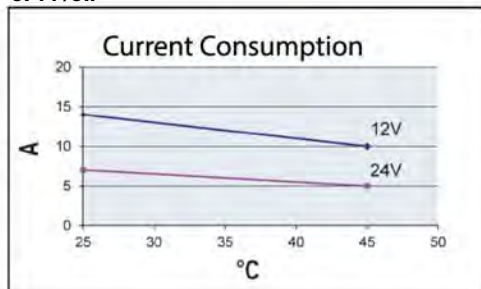
- 1) Pressure does not exceed 50% of maximum pressure (per above table)
- 2) Motor temperature is below 60/70 °C (140/158 °F)
- 3) Viscosity not exceeding 20 cSt (UP14 & UP14-P), 350 cSt (UP14/Oil)
- 4) Minimum 12 mm diameter connections

Mouting Position: Pump can be mounted in any orientation

UP14 & UP14-P



UP14 /Oil



PUMPS ARE NOT FOR USE WITH:

- Gasoline (Petrol)
- Flammable liquids with PM<38°C (100 °F)
- Liquids with viscosity> 20cSt (UP14 & UP14-P)
- Liquids with viscosity> 350cSt (UP14/Oil)
- Foodstuff liquids
- Corrosive chemical products
- Solvents

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 slip-page and longer service life.

Standard pumps operate to 250°F and, with modifications, to 500°F.

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.



Model 00 Gear Pump

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)

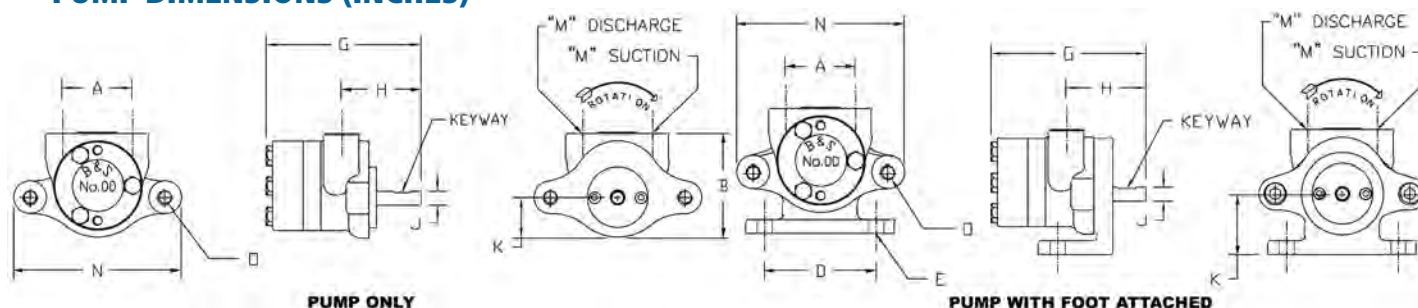
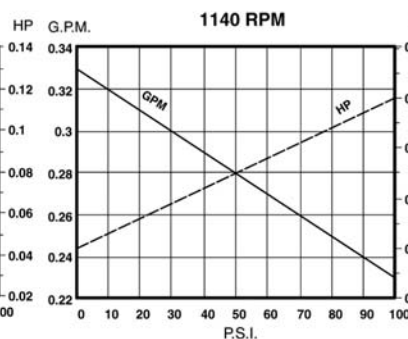
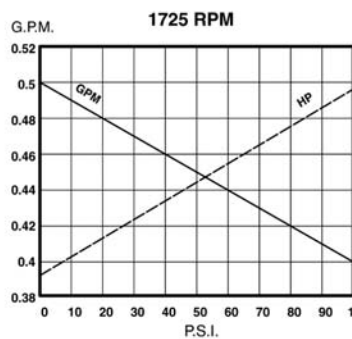


Table 1

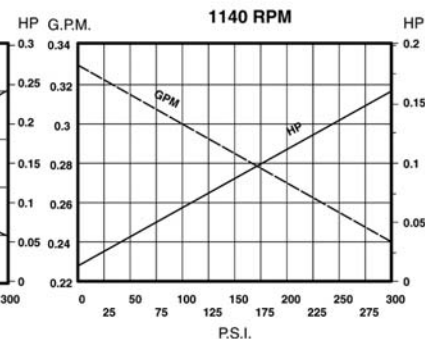
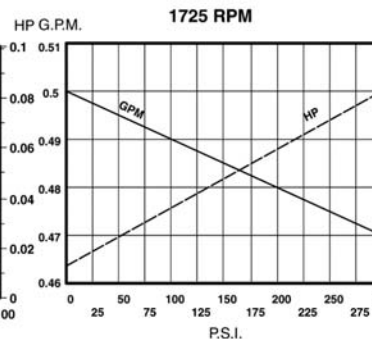
Model	A	D	E	G	J	K	M	O	Keyway
00	1.888	3.00	0.41	4.19	0.38	1.63	0.375	3/8-16	Flat

FLOW CURVES

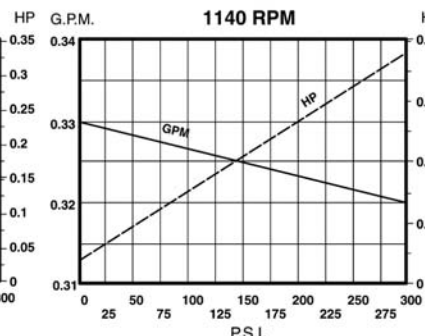
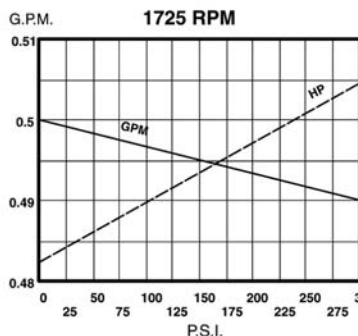
32 SSU LIQUID



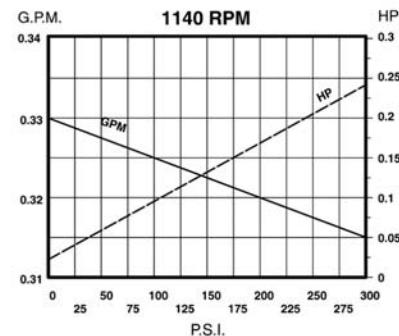
300 SSU LIQUID



1000 SSU LIQUID



1750 SSU LIQUID



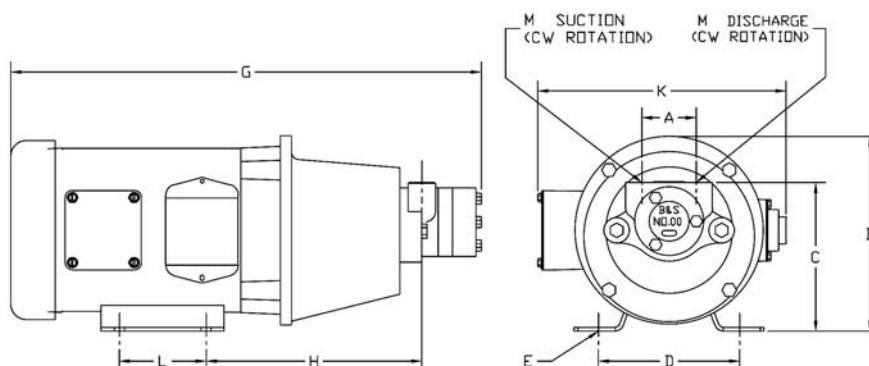
OPERATING CHARACTERISTICS

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	

CLARK SOLUTIONS

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.

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.



B Series Gear Pump



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.

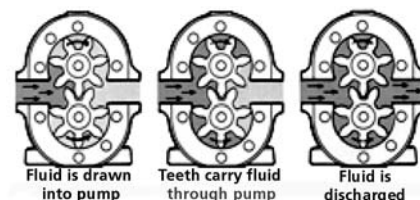
• SEALS

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

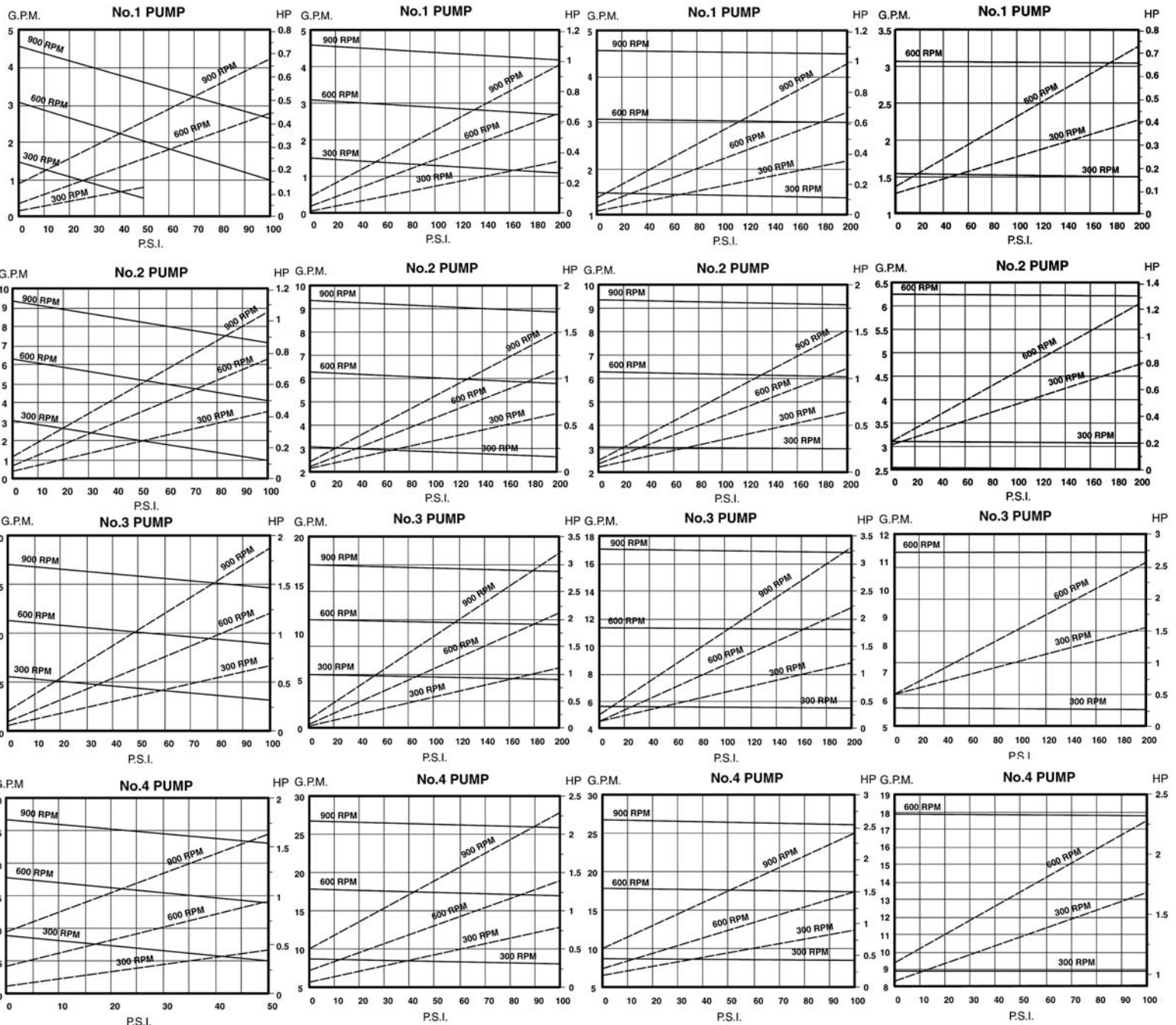
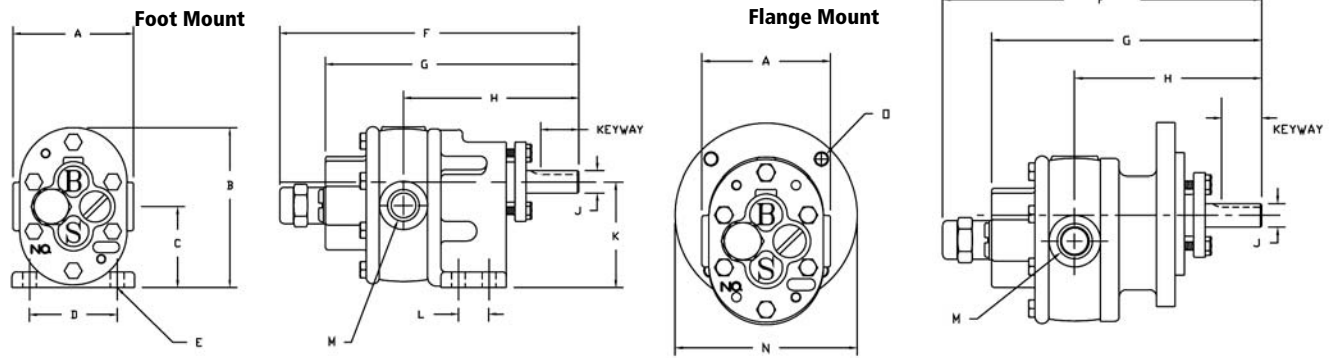


Table 1

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)



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.

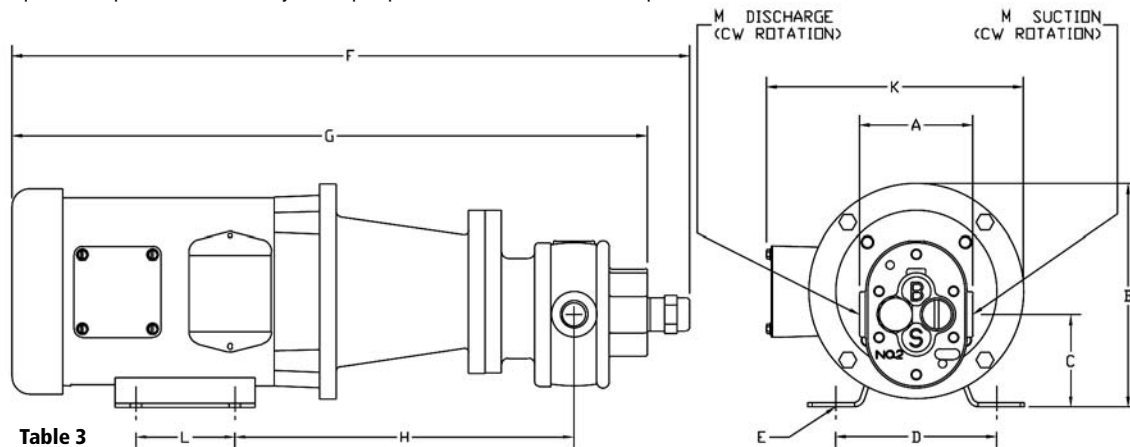


Table 3

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
	145TC	4.44	6.88	2.50	5.50	0.34	25.54	23.91	12.25	8.56	5.00	1 1/4
4A	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..

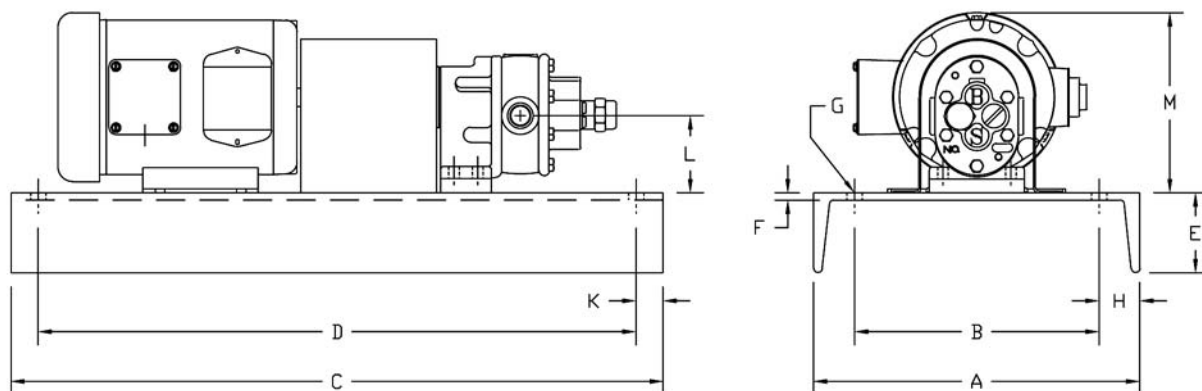


Table 4

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
3D	184TC	15.00	12.00	32.00	30.00	3.41	0.41	0.56	1.50	1.00	3.81	8.69
	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
4D	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
5D	215TC	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.25	10.25
	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
6D	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	

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.

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 available with different elastomers for pumping different types of liquids.

Lubrication: Self-lubricating using the pumped liquid. Also available for handling non-lubricating liquids.

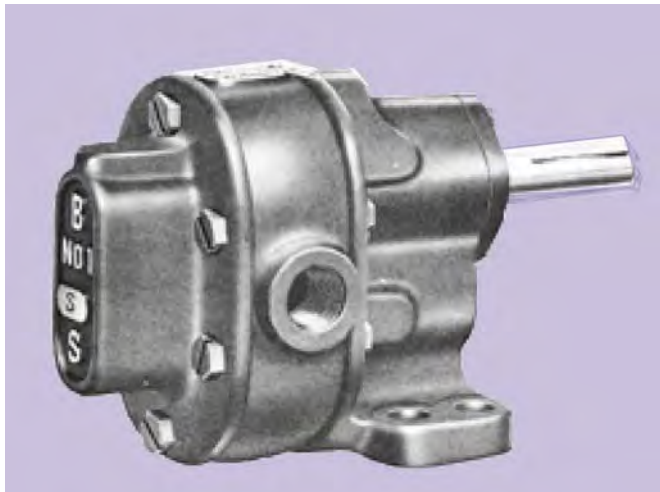
Rotation: Pumps may be operated in either direction. Discharge is always on the side of the pump toward which the top of the shaft rotates. Specify when ordering.

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.



S Series Gear Pump



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.

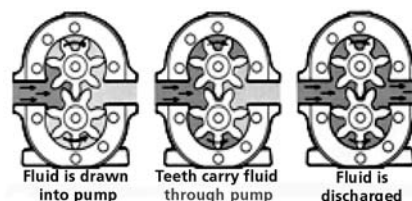
• BEARINGS

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.

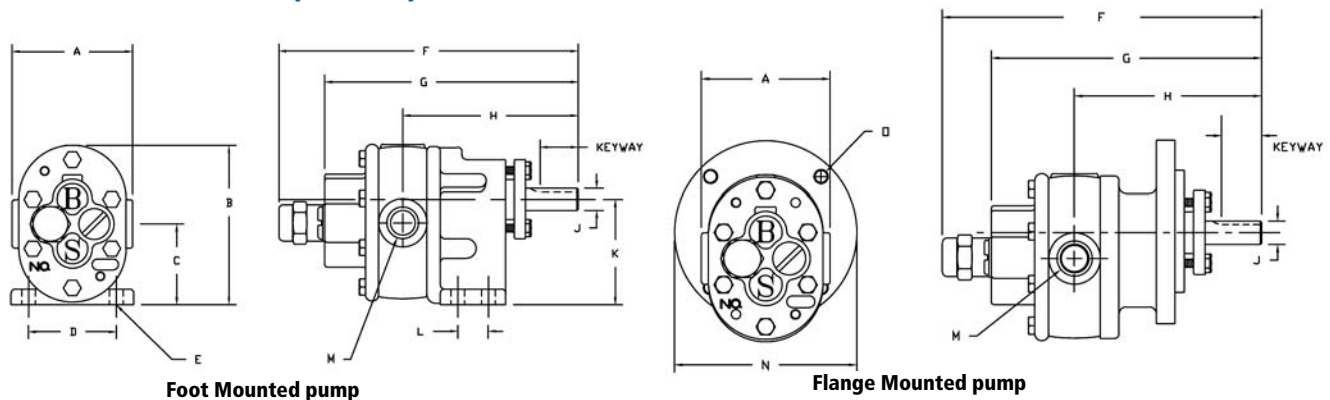
• SEALS

Self-adjusting mechanical seals provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION



PUMP DIMENSIONS (INCHES)



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.

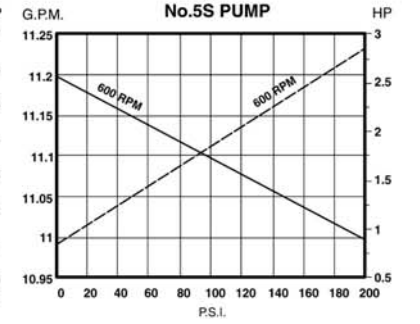
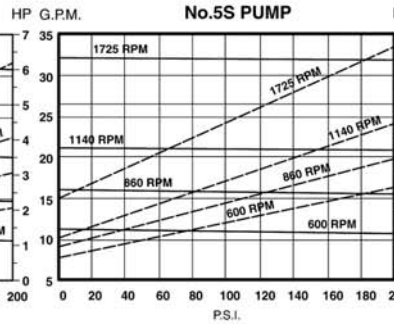
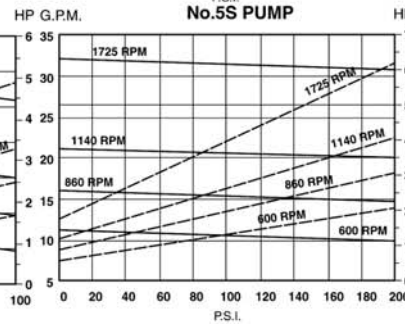
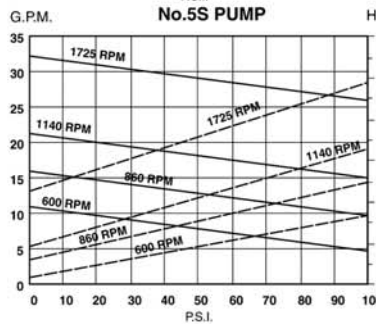
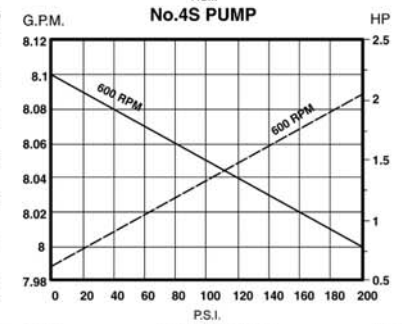
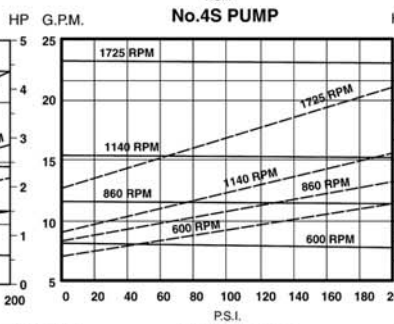
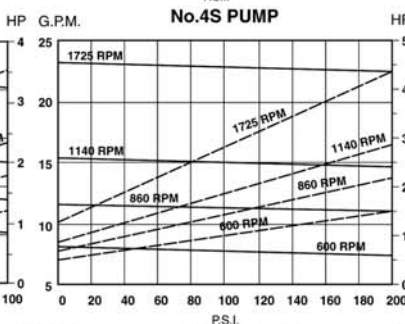
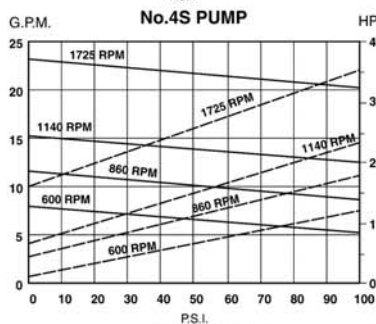
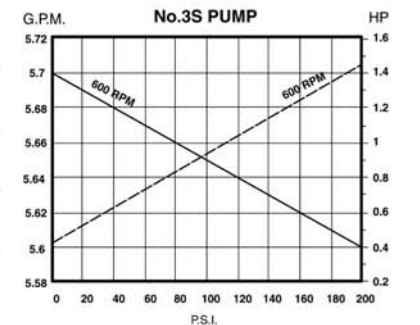
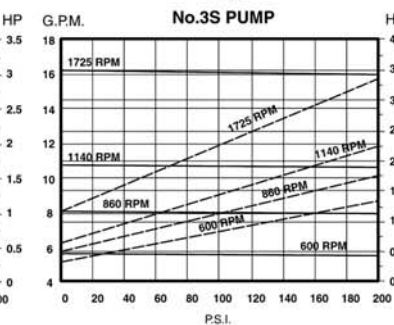
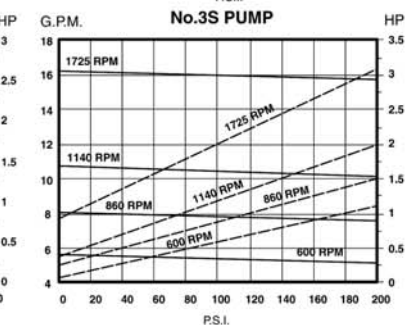
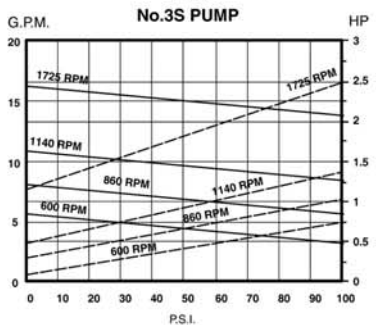
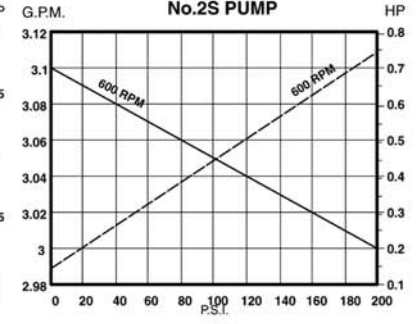
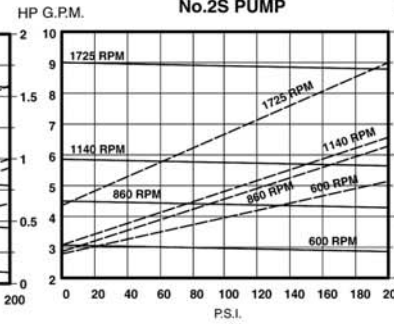
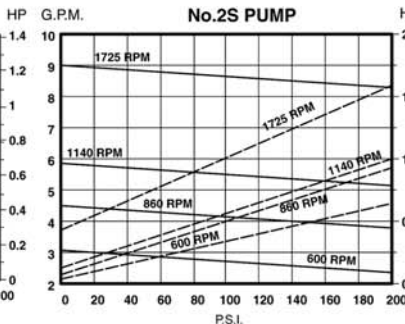
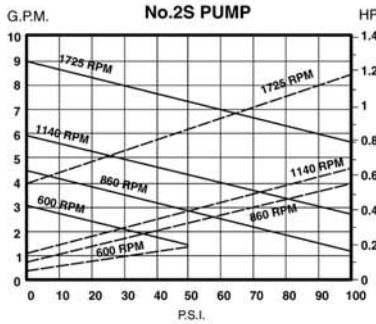
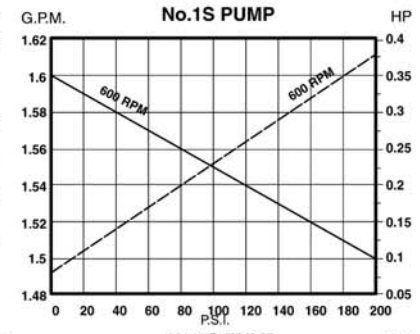
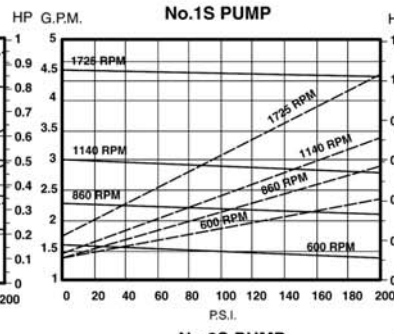
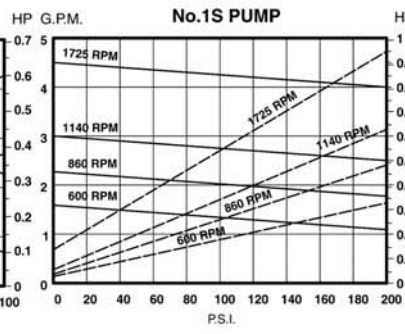
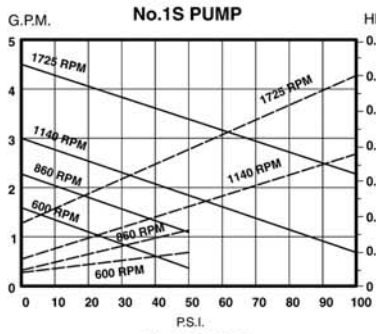
SOLID LINE = GPM BROKEN LINE= HP

32 SSU LIQUID

300 SSU LIQUID

1,000 SSU LIQUID

5,000 SSU LIQUID



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.

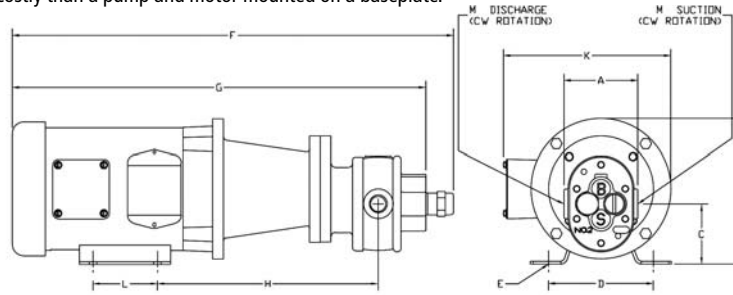


Table 3

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..

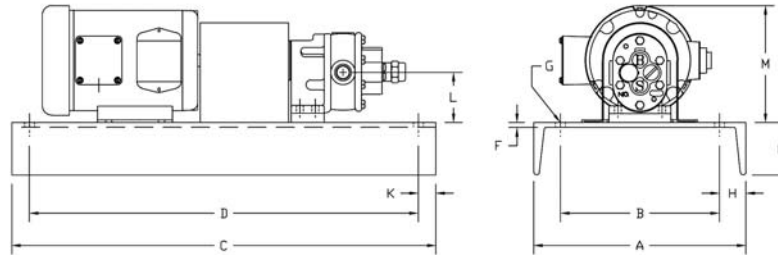


Table 4

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 an E-Drive, ensures accurate alignment and requires less space than a pump connected to the C-Face of a motor.

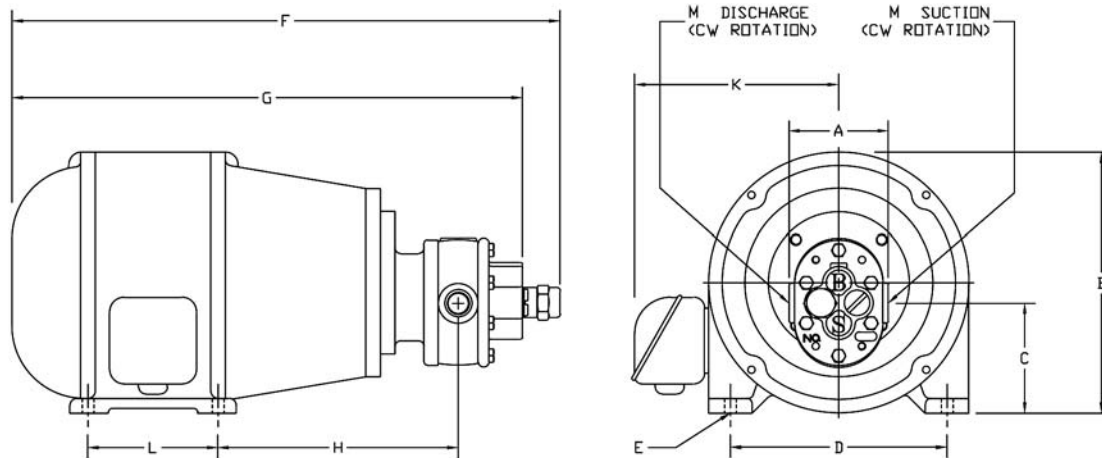


Table 5

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
	182	3.44	9.00	3.81	7.50	0.406	18.91	17.66	8.31	7.06	4.50	1/2
2SE	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 920=Flange Mount Model 2S 930=Flange Mount Model 3S 940=Flange Mount Model 4S 950=Flange Mount Model 5S	10= Foot Mount Model 1S 20= Foot Mount Model 2S 33= Foot Mount Model 3S 40= Foot Mount Model 4S 50=Foot Mount Model 5S	2= CW Without Relief Valve 3= CCW Without Relief Valve 7= CW With Relief Valve 8=CCW With Relief Valve Select Model & Motor Frame From Tables 3, 4 or 5 Example: 3SA-182TC	A= Factory Assembly B= Field Assembly

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 Combinations

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.

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.

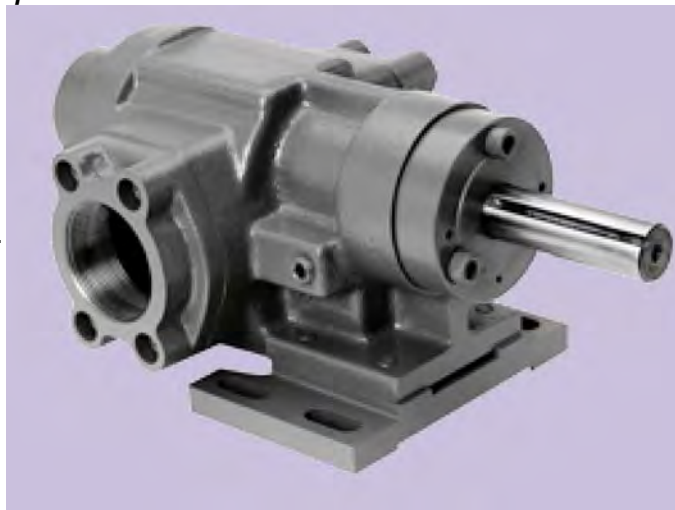
Rotation: Clockwise or counter-clockwise rotation. A reversible back drain permits direction of rotation to be easily changed in the field.

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.



Foot Mounted Pump



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.

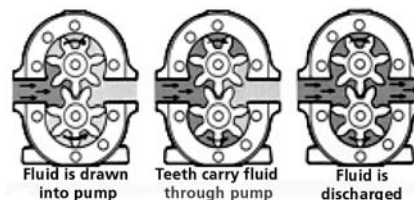
• BEARINGS

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



PUMP DIMENSIONS (INCHES)

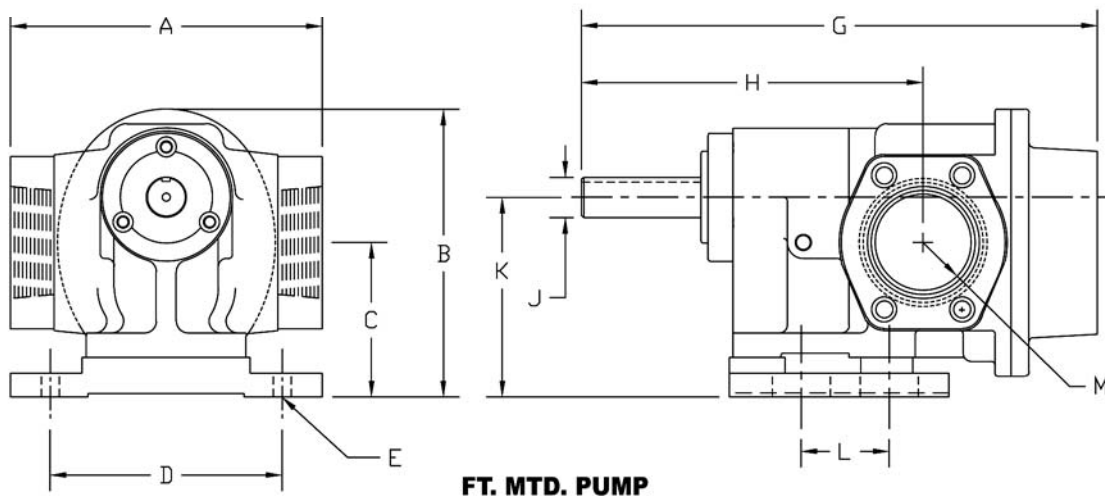


Table 1

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.

FLOW CURVES

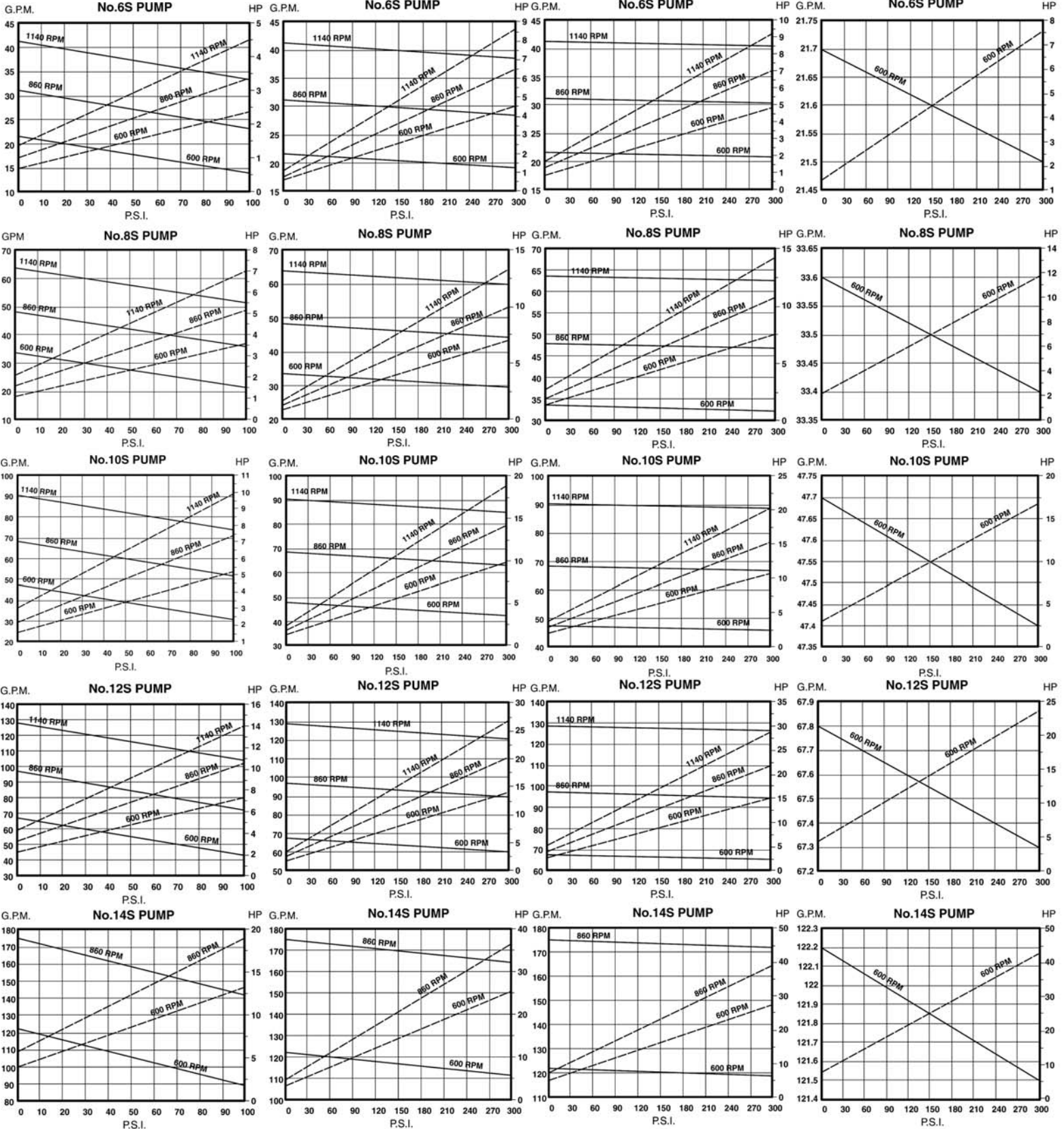
SOLID LINE = GPM BROKEN LINE= HP

32 SSU LIQUID

300 SSU LIQUID

1,000 SSU LIQUID

5,000 SSU LIQUID



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..

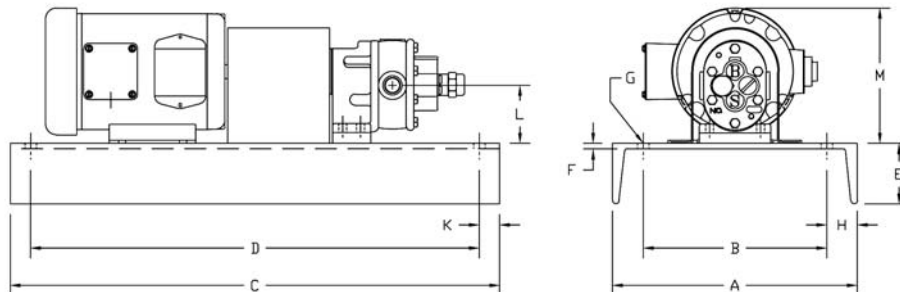


Table 3

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
10SD	286T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	2.00	5.58	14.63
	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
12SD	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
	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
14SD	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
14SD	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	
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.

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.

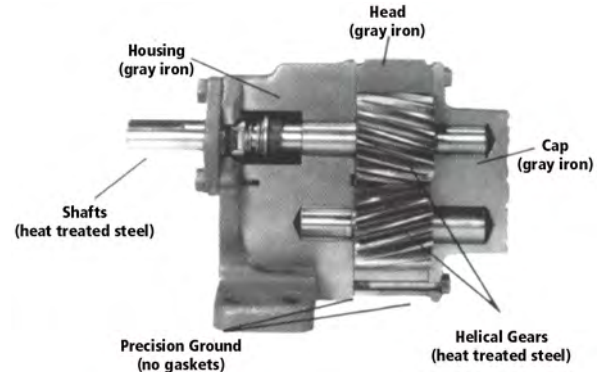
Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

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 connected by V-belt and pulleys mounted on baseplate).

Accessories: Repair Kits, Gear Sets, Bearing Kits, and Seal Kits.



Foot Mounted Pump



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.

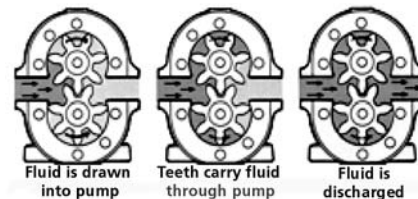
• BEARINGS

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



PUMP DIMENSIONS (INCHES)

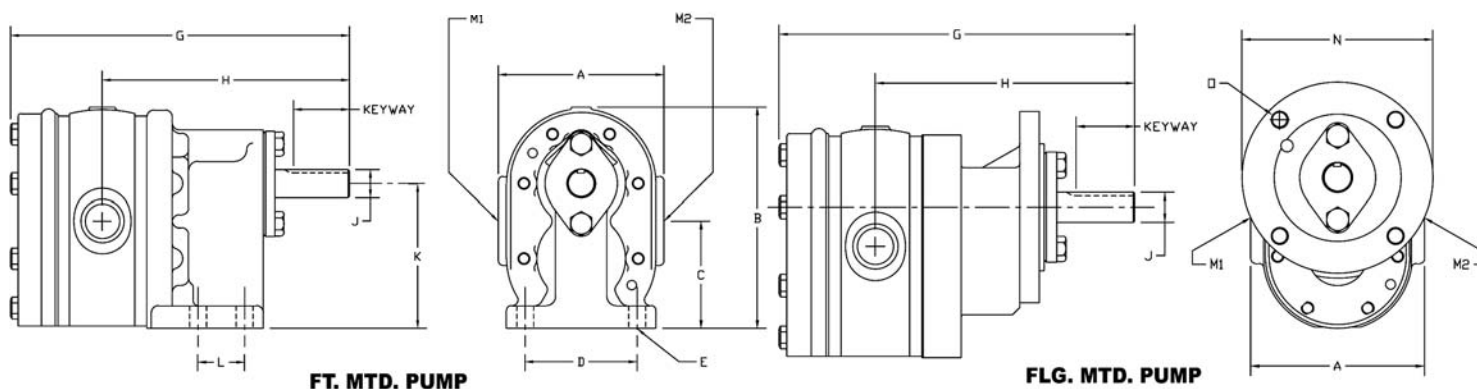


Table 1

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.

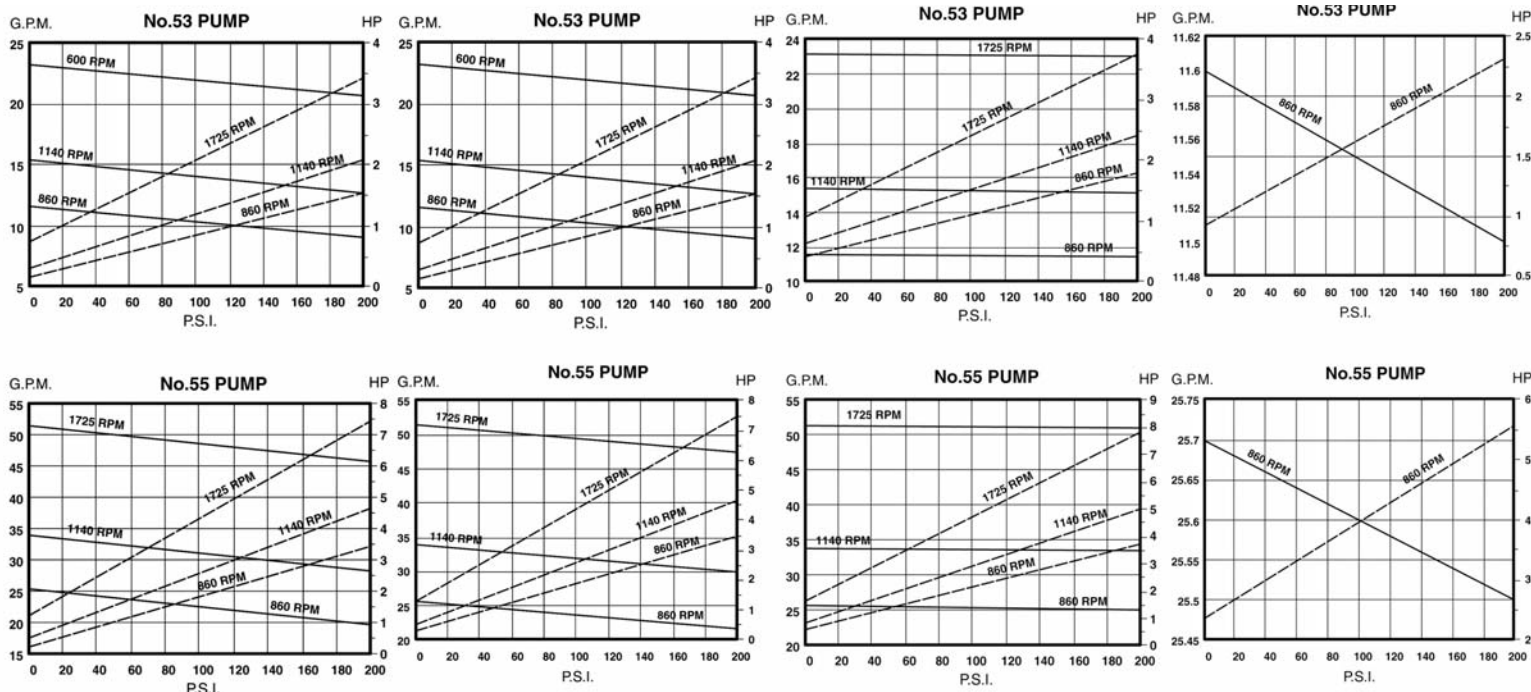
FLOW CURVES

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.

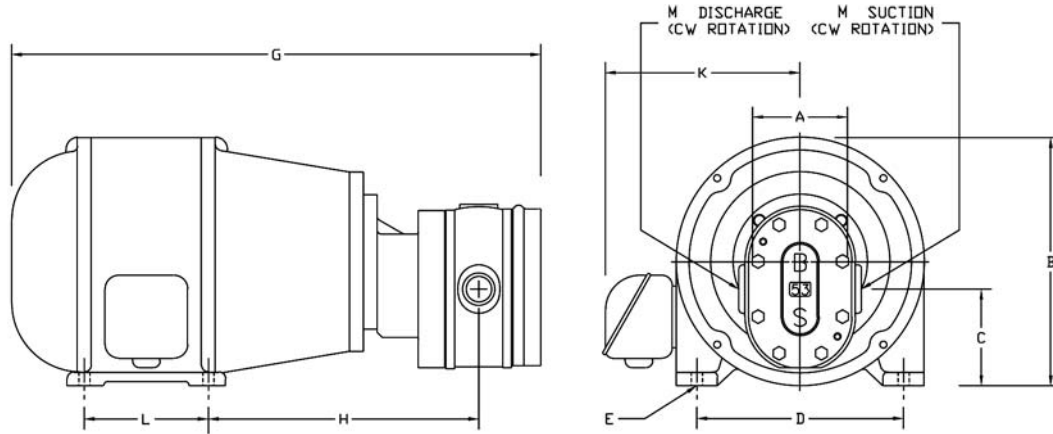


Table 3

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.

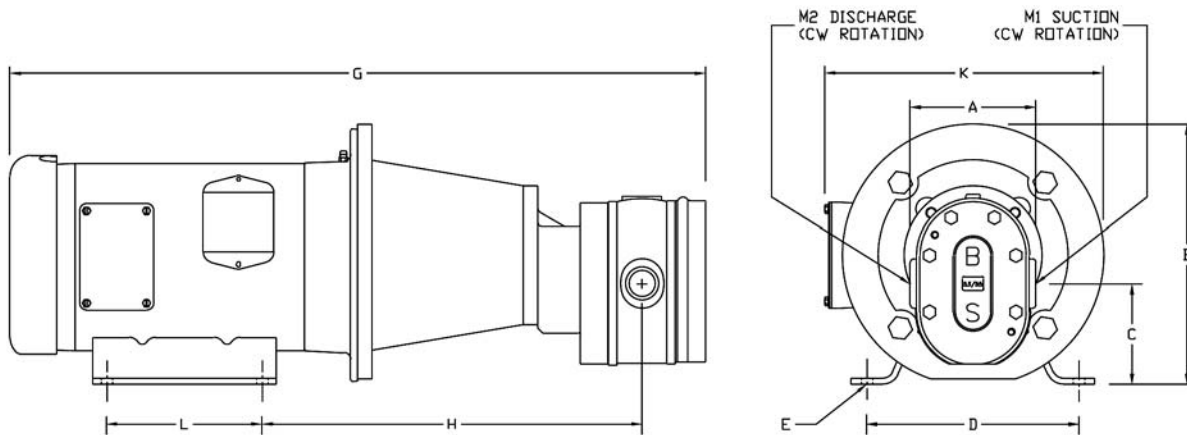


Table 4

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..

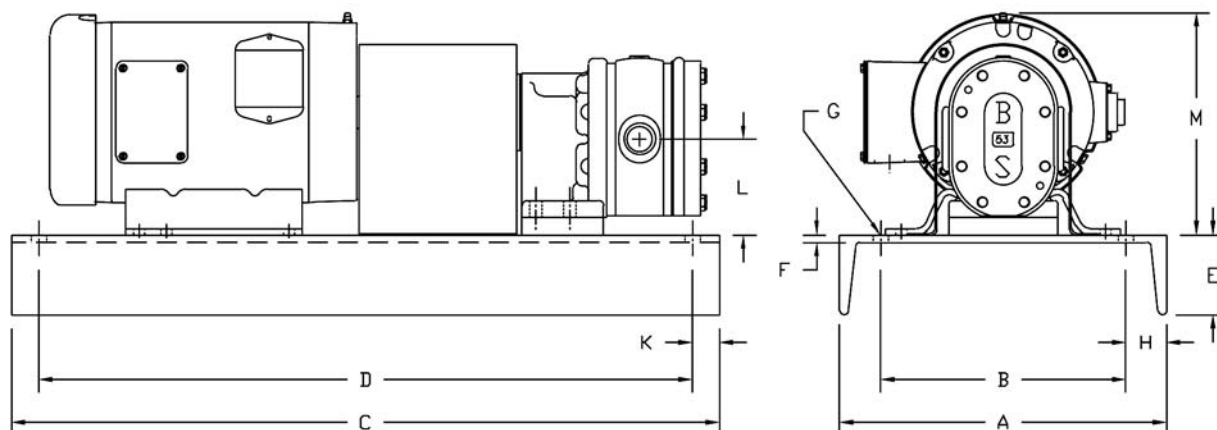


Table 5

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	
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
<p>1) Specify motor frame: tables 4,5 or 6 2)Specify motor speed & horsepower (see flow charts) 3) Specify voltage, frequency & enclosure rating</p> <p>Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.</p>

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.

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. Mechanical 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.

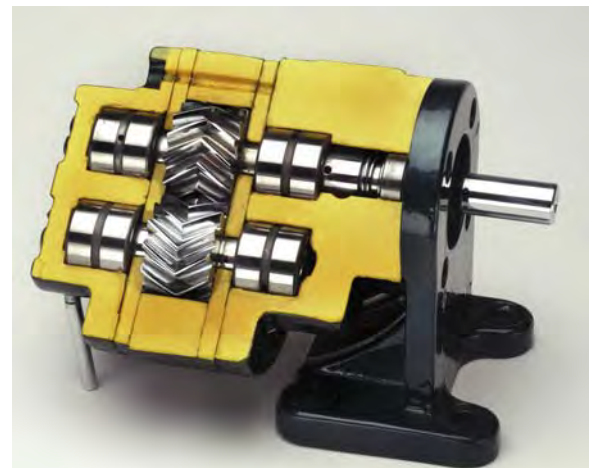
Suction Lift: Up to 28" Hg / 31 feet depending on the type of liquid being pumped.

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.



S Series Gear Pump



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.

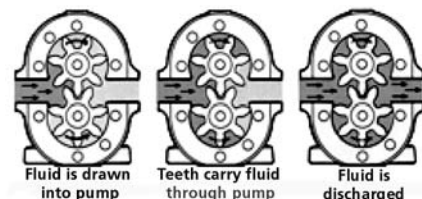
• BEARINGS

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

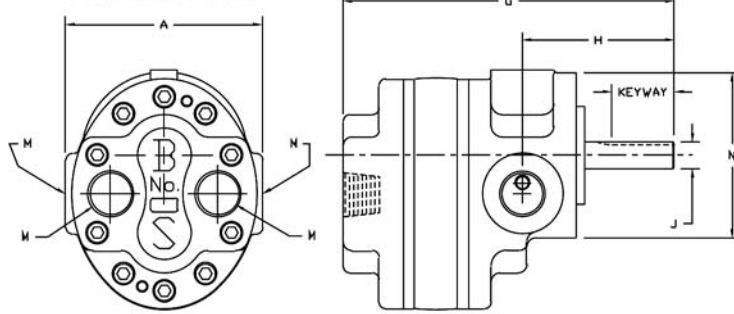
Self-adjusting mechanical seal and compression packing provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION

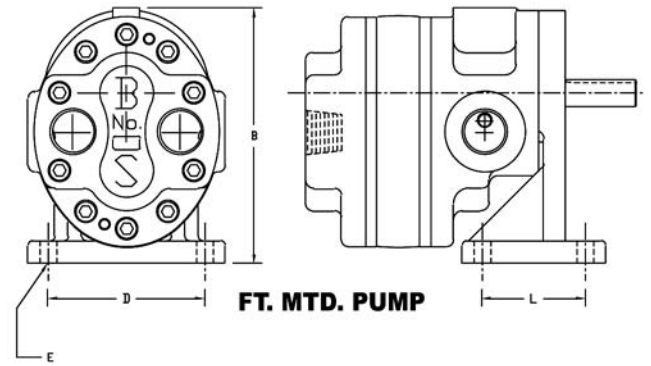


PUMP DIMENSIONS (INCHES)

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	-	-

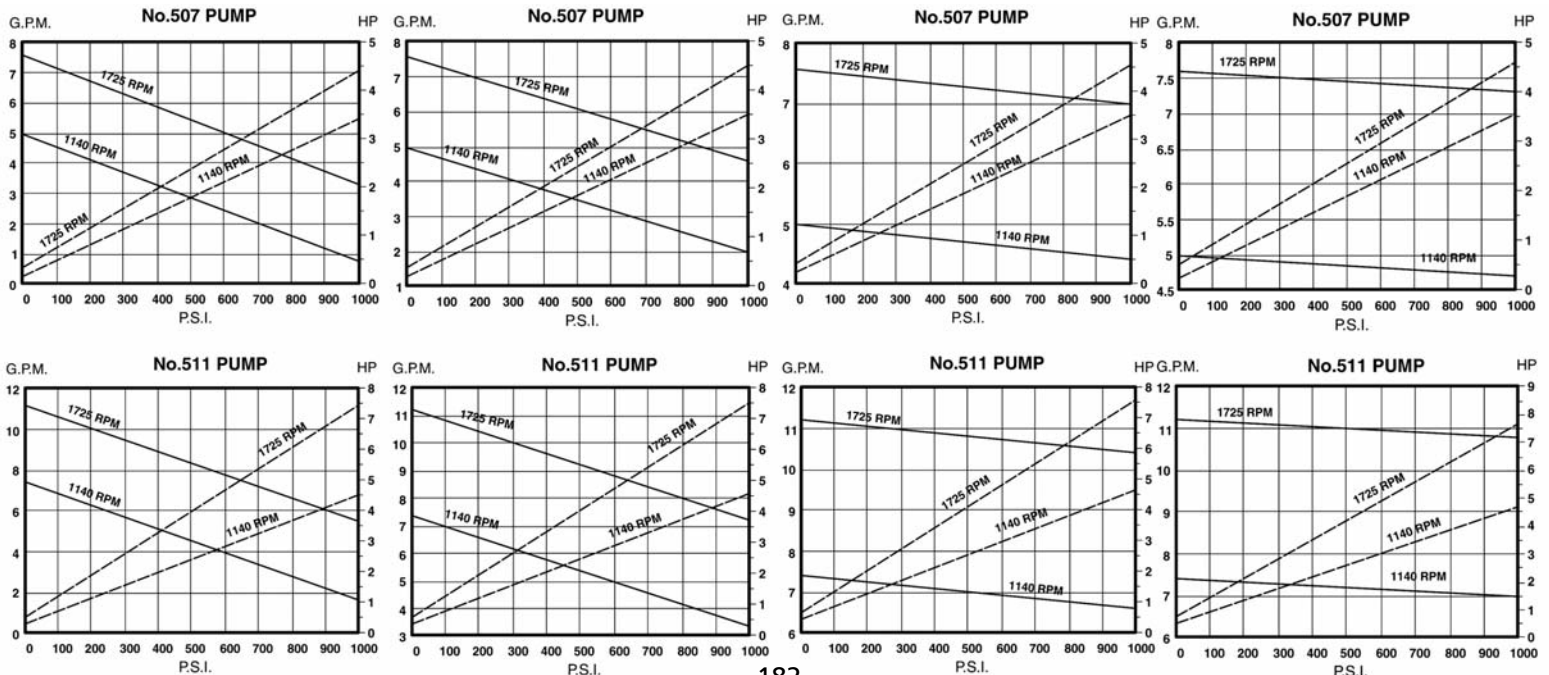
FLOW CURVES

70 SSU LIQUID

100 SSU LIQUID

500 SSU LIQUID

1,000 SSU LIQUID



FLOW CURVES

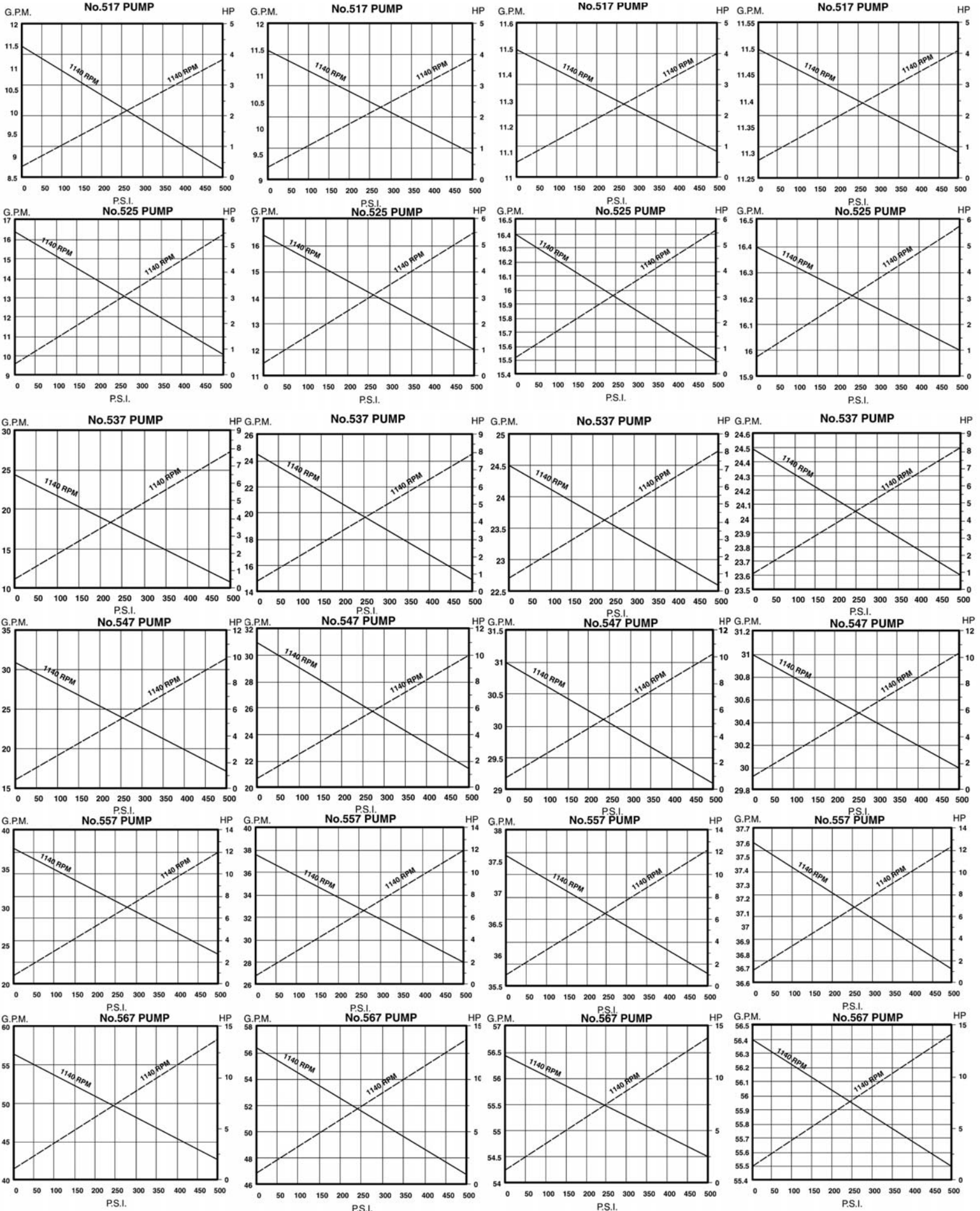
70 SSU LIQUID

100 SSU LIQUID

500 SSU LIQUID

1,000 SSU LIQUID

SOLID LINE = GPM BROKEN LINE= HP



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 an E-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

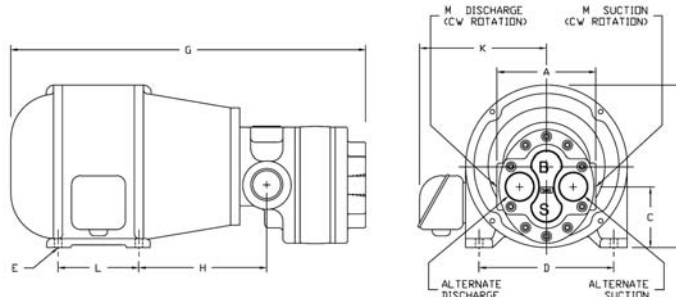


Table 3

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
517E	256U	4.00	12.38	5.94	10.00	0.531	N/A	26.81	8.12	9.81	10.00	3/4
	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
	213	5.50	10.38	4.16	8.50	0.406	N/A	22.19	7.81	7.94	5.50	1
525E	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
	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
537E	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
	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
547E	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
	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
557E	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
567E	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.

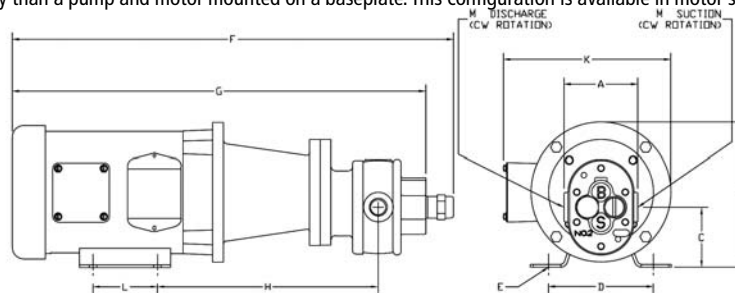


Table 4

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
537A	254TC	5.50	12.88	5.63	10.00	0.53	32.31	13.25	16.09	8.25	1
	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
547A	256TC	6.25	12.88	5.00	10.00	0.53	35.06	14.00	16.09	10.00	1 1/2
	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
557A	256TC	6.25	12.88	5.00	10.00	0.53	35.56	14.00	16.09	10.00	1 1/2
	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
567A	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
	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
567A	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..

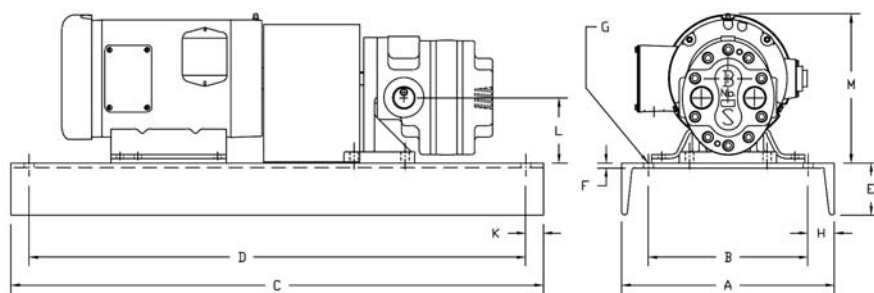


Table 5

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
525D	215T	15.00	12.00	36.00	34.00	3.41	0.41	0.56	1.50	1.00	4.63	10.25
	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
537D	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
	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
547D	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
	182T	12.00	9.00	30.00	28.00	2.94	0.41	0.56	1.50	1.00	3.25	8.69
557D	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
567D	284T	24.00	20.00	48.00	44.00	3.17	0.51	0.63	2.00	1.00	5.75	14.63
	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 9504=Flange Mount Model 504 9507=Flange Mount Model 507 9511=Flange Mount Model 511 9517=Flange Mount Model 517 9525=Flange Mount Model 525 9537=Flange Mount Model 537 9547=Flange Mount Model 547 9557=Flange Mount Model 557 9567=Flange Mount Model 567	502= Foot Mount Model 502 504= Foot Mount Model 504 507= Foot Mount Model 507 511= Foot Mount Model 511 517=Foot Mount Model 517 525=Foot Mount Model 525 537=Foot Mount Model 537 547=Foot Mount Model 547 557=Foot Mount Model 557 567=Foot Mount Model 567	2= CW 3= CCW Select Model & Motor Frame From Tables 3 ,4 or 5 Example: 557A-184TC	A= Factory Assembly B= Field Assembly	

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
<p>1)Specify motor speed & horsepower (see flow charts) 2) Specify voltage, frequency & enclosure rating</p> <p>Please call us to discuss your motor requirements. We offer a complete range of AC & DC motors as well as variable frequency drives.</p>

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.

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.

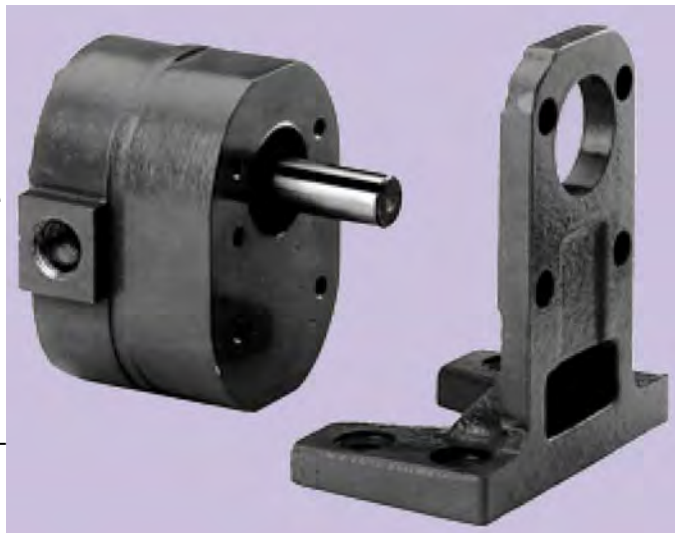
Rotation: Clockwise or counter-clockwise, specify at time of order.

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.



700 Series Gear Pump



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.

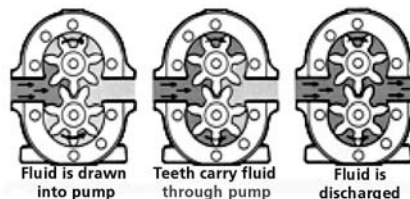
• BEARINGS

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

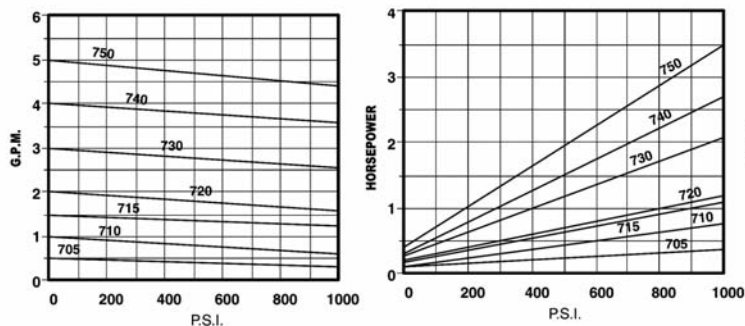
Lip seal provides an ample safeguard against liquid leakage and the entrance of air.

PRINCIPLE OF OPERATION

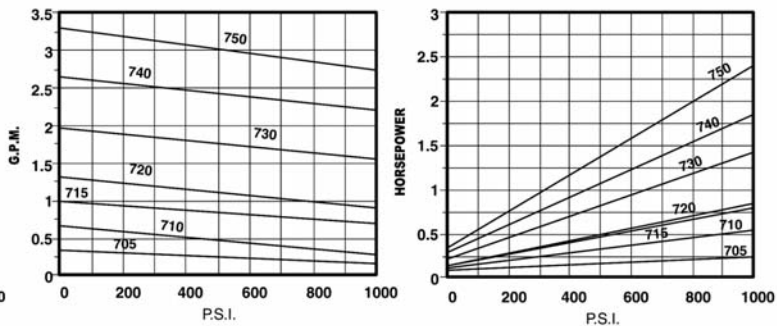


FLOW CURVES

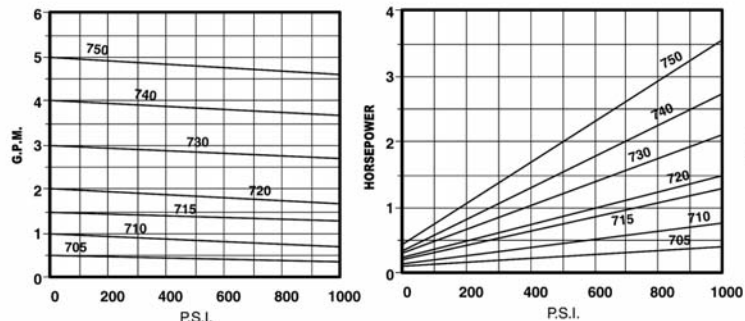
1725 RPM- 70 SSU LIQUID



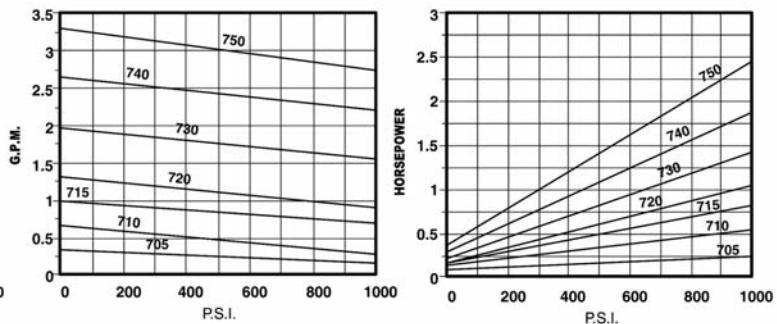
1140 RPM- 70 SSU LIQUID



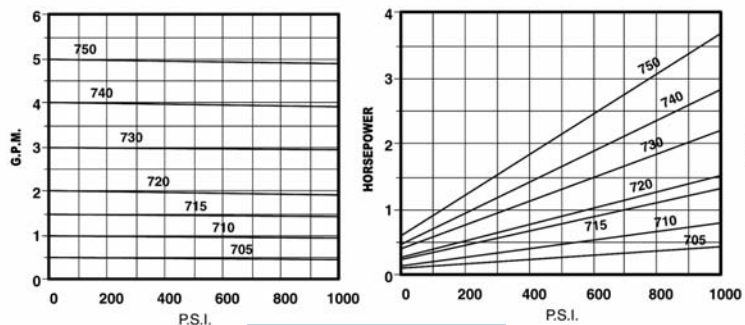
1725 RPM- 100 SSU



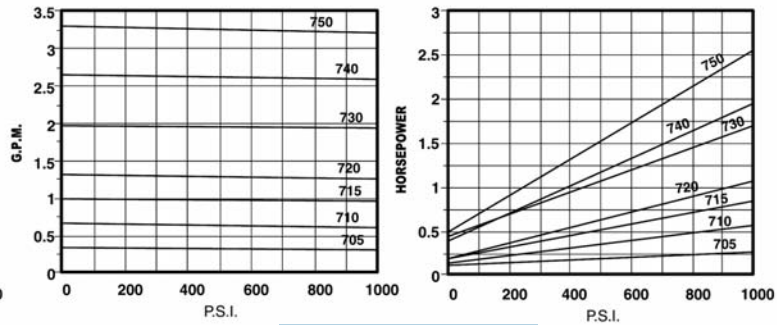
1140 RPM- 100 SSU



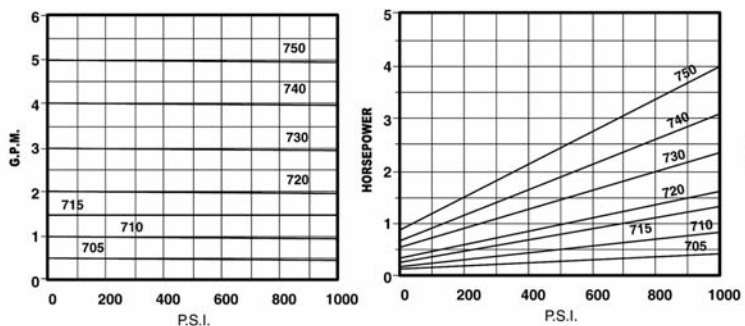
1725 RPM- 500 SSU



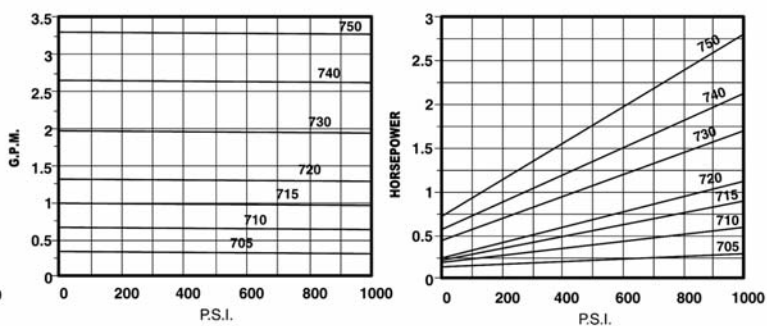
1140 RPM- 500 SSU



1725 RPM- 1000 SSU



1140 RPM- 1000 SSU



PUMP DIMENSIONS (INCHES)

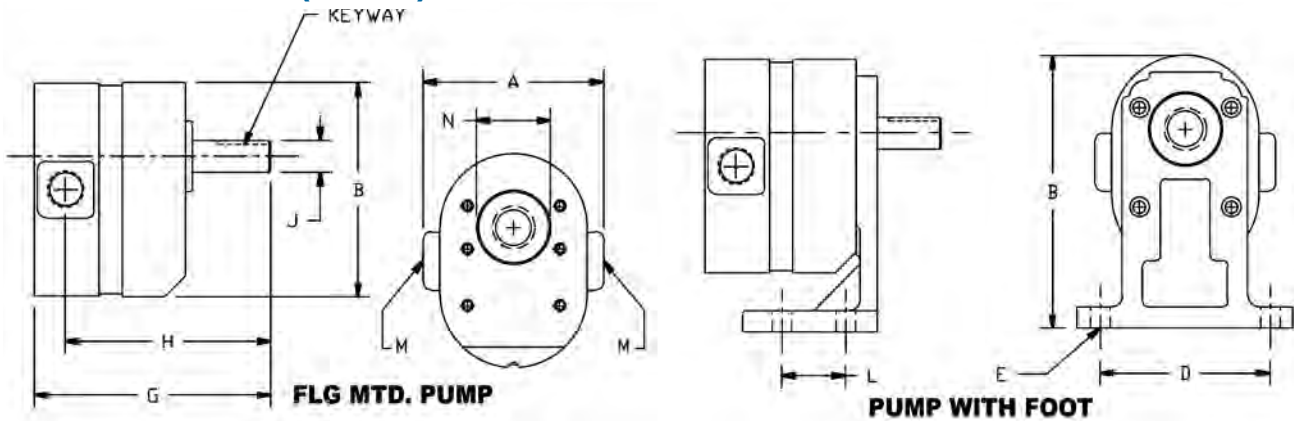


Table 1

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)

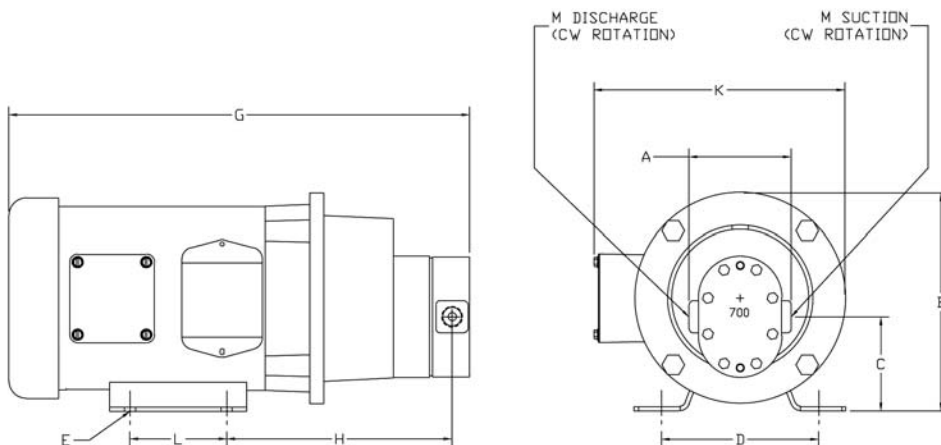


Table 3

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.

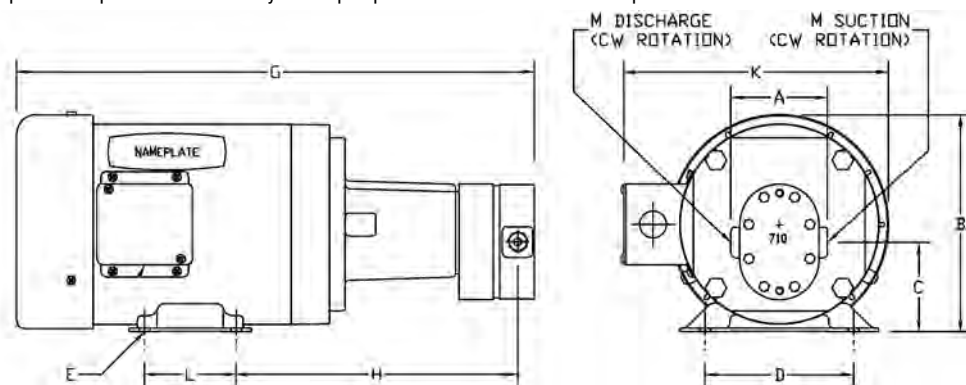


Table 4

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, enclon			

E- Options

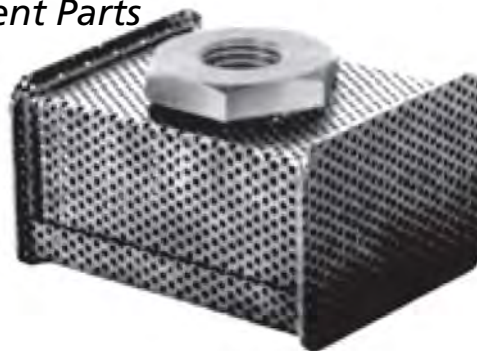
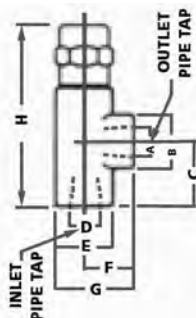
Opt 1= Ductile Iron Casing

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
00	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)
15	713-9010-205	713-9010-280 (CP)
25	713-9020-205	713-9020-280 (CP)
35	713-9030-205	713-9030-280 (CP)
45	713-9040-205	713-9040-280 (CP)
55	713-9050-205	713-9050-280 (CP)
65	713-9060-205	713-9060-280 (CP)
85	713-9080-205	713-9080-280 (CP)
105	713-9100-205	713-9100-280 (CP)
125	713-9120-205	713-9120-280 (CP)
145	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)
15ST	713-9010-205-SS	713-9010-280-SS (CP)
25ST	713-9020-205-SS	713-9020-280-SS (CP)
35ST	713-9030-205-SS	713-9030-280-SS (CP)
45ST	713-9040-205-SS	713-9040-280-SS (CP)
55ST	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 & 15	713-9001-107 (Set of 4)
2, 12 & 25	713-9002-107 (Set of 4)
3, 4, 13, 35, 45 & 55	713-9003-107 (Set of 4)
53 & 55	423-1646 (Set of 3) 423-1647 (Set of 1)
65	423-11 (Set of 4)
85 & 105	423-9 (Set of 4)
125 & 145	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 & 15	713-9010-270
2 & 25	713-9020-270
3, 4, 35, 45 & 55	713-9030-270
65	466-137-2
85, 105	466-292
125, 145	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
700 Series	466-279 (Buna N)
700 Series	215-10118 (Viton)

Compression Packing

Pump Model	Packing P/N
1, 15, 11, 21 & 15ST	466-3161-4 or 466-192 (Teflon)
2, 25, 12, 22 & 25ST	466-3162-4 or 466-193 (Teflon)
3, 35, 45, 55, 13, 23, 24, 35ST, 45ST, 55ST	466-3163-4 or 466-194 (Teflon)

* Available with different elastomers, consult us

BOXER**20K Series Diaphragm Pump**

Gas Flow Rate to 500 ml/min

DESCRIPTION

The 20K series is a single headed miniature diaphragm pump. With a 'best-in-class' body width of just 12 mm it is designed for applications requiring minimized size, power and weight. Typical examples include portable environmental gas analysis, medical monitoring, medical therapy and chemical agents / biohazard detection.

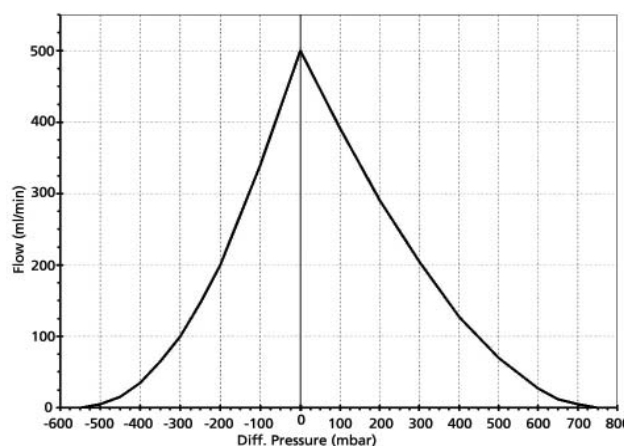


Recognizing that instrument miniaturization can often result in lower performance requirements, the 20K is additionally available in a 'Low Flow' configuration, which maximizes efficiency (longer battery life) at the lower end flow range of this series. This is achieved through the use of optimized low speed coreless motors combined with a pump head specifically designed for low flow. These pumps are listed below as 'Coreless LF'. Additionally stable flow valve technology ensures consistent operation at flows below 50 ml/m without influence from the pump's orientation.

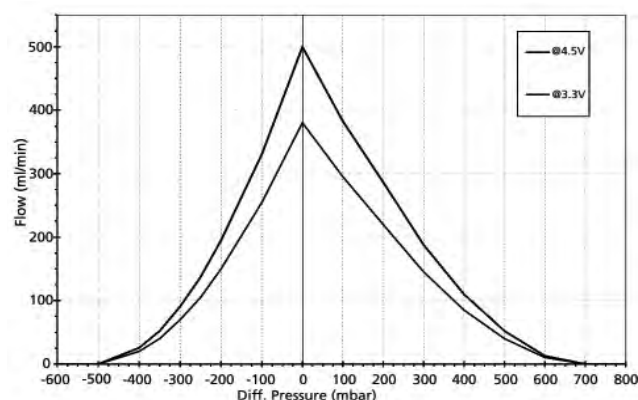
SPECIFICATIONS

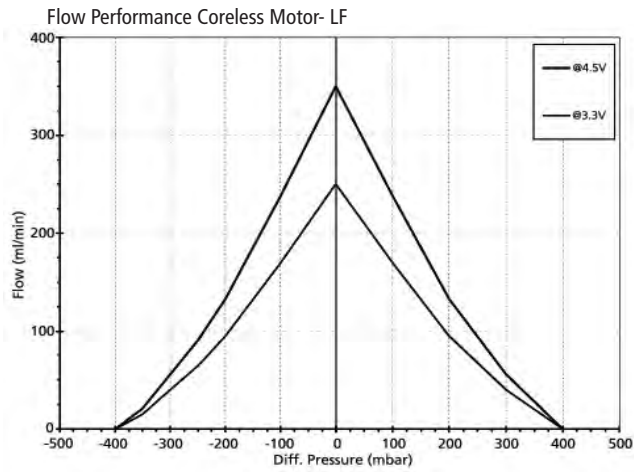
Technical Data	Iron Core Motor	Coreless Motor	LF Coreless Motor
Free flow/Max Pressure/Max Vacuum at 6.5V	500 ml/min/750 mbar/-550 mbar	-	-
Free Flow/Max Pressure/Max Vacuum at 4.5V	-	500 ml/min/700 mbar/-500 mbar	350 ml/min/400 mbar/-400 mbar
Free Flow/Max Pressure/Max Vacuum at 3.3V	-	380 ml/min/700 mbar/-500 mbar	250 ml/min/400 mbar/-400 mbar
Power Consumption at 6.5V	0.3 to 0.7 W	-	-
Power Consumption at 4.5V	-	0.5 to 0.7 W	0.1 to 0.2 W
Power Consumption at 3.3V	-	0.3 to 0.5 W	0.1 to 0.2 W
Operating Temperature Range	5 to 60°C		
Operating Humidity Range	5 to 95% RH		
Elastomer Options	EPDM		
Other Wetted Parts	PPS (Polyphenylene Sulphide)		
Motor Termination	Solder Tags	100 mm leads (red +, black -)	
Tube Connection	3.0 mm barb for 2.0 to 2.5 mm Ø tubing		
Weight	22g	16g	

Flow Performance Iron Core Motor



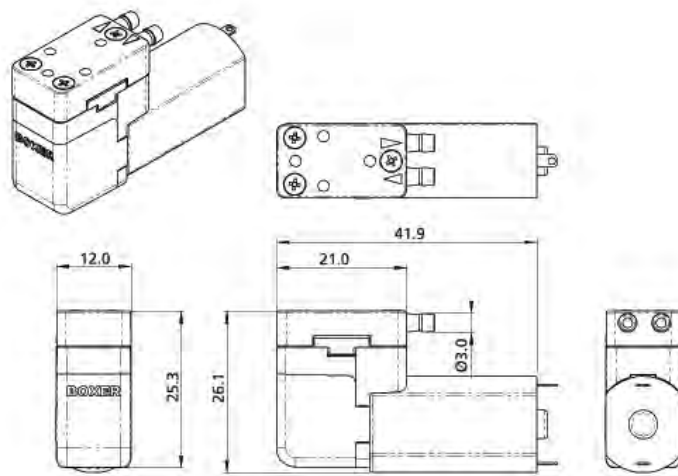
Flow Performance Coreless Motor



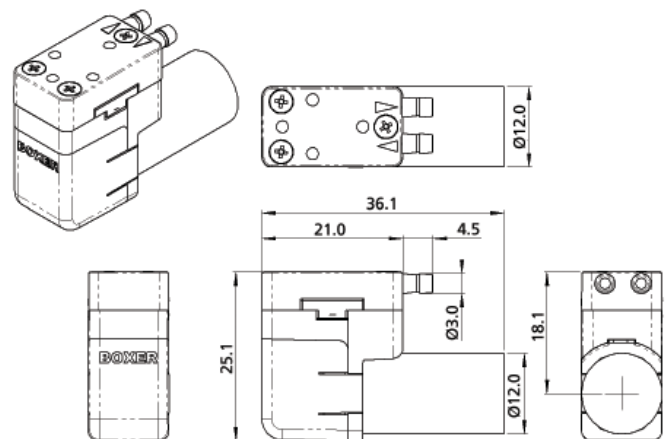


DIMENSIONS (MM)

Iron Core Motor



Coreless Motor & Coreless-LF



ORDERING INFORMATION

Model	Motor Type	Nominal Voltage (VDC)
20000.00	Iron Core	6.5
20100.001	Coreless	3.5
20100.002	Coreless- LF	3.3

BOXER

20KD Series Diaphragm Pump

Gas Flow Rate to 800 ml/m

DESCRIPTION

The 20KD series is a miniature diaphragm pump which, uniquely for this class of pump, offers the significant advantages of a double head design within a 12 mm width frame size. The double headed construction extends performance range to an impressive 75% vacuum and 1.5 bar pressure, reduces pulsation and offers slow running with the associated benefits of reduced sound and extended life. Typical examples include portable environmental gas analysis, medical monitoring, medical therapy and chemical agents / biohazard detection.

The 20KD is additionally available in a 'Low Flow' configuration that maximizes efficiency (hence also battery life) at the lower end flow range of this series. This is achieved through the use of an optimized low speed coreless motor combined with a pump head specifically designed for low flow. They are listed as below as 'Coreless LF'.

Use of high strength glass filled PPS plastics ensure a robust construction with a high degree of air-tightness throughout the performance and environmental operating range.

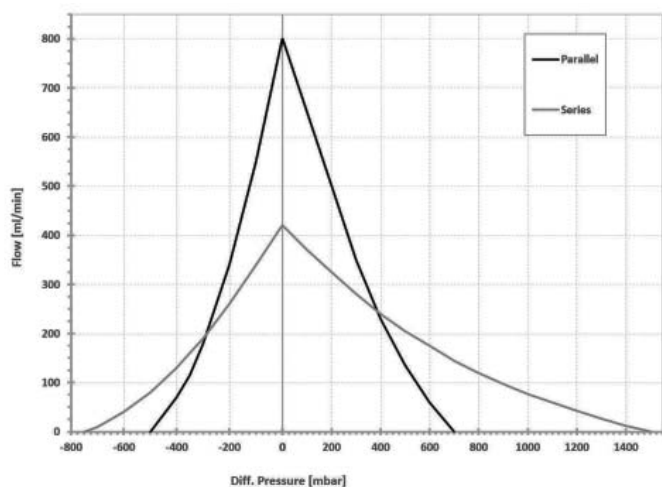
The flat design also facilitates 'twin' mounting offering the flexibility of 4 independent gas channels within a 24mm width.

Flow control is available in combination with PWM Flow Controller.

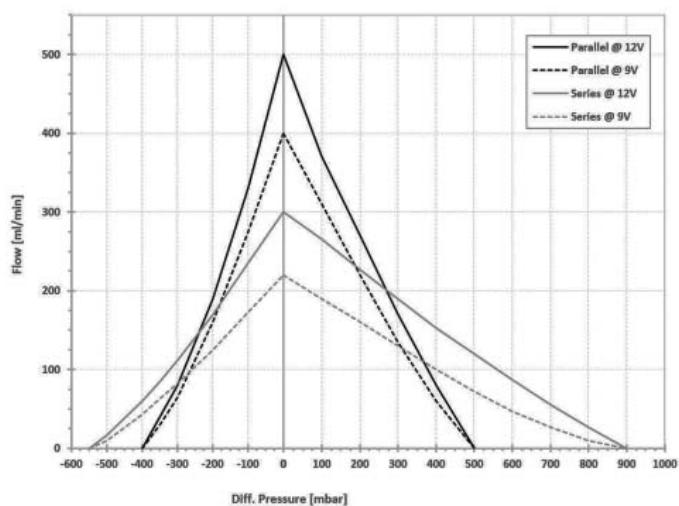


SPECIFICATIONS	Iron Core Motor 8 VDC Power	Coreless Motor-LF Operating at 9 VDC Power	Coreless Motor-LF Operating at 12 VDC Power
Parallel Connection			
Power Consumption	0.8 to 1.2 W	0.1 to 0.3 W	0.2 to 0.4 W
Max. Free Flow	800 ml/min	400 ml/min	500 ml/min
Max Pressure	700 mbar	500 mbar	500 mbar
Max Vacuum	-500 mbar	-400 mbar	-400 mbar
Series Connection			
Power Consumption	0.8 to 1.6 W	.01 to 0.4 W	0.2 to 0.5 W
Max. Free Flow	420 ml/min	220 ml/min	300 ml/min
Max Pressure	1500 mbar	900 mbar	900 mbar
Max Vacuum	-750 mbar	-550 mbar	-550 mbar
Motor Termination	Solder Tags	100 mm leads, red(+), black(-)	
Operating Temperature Range	5 to 60 °C		
Operating Humidity Range	5 to 95%		
Elastomer Options	EPDM		
Other Wetted Parts	PPS (Polyphenylene Sulphide)		
Tube Connection	3.0 mm barb for 2.0 to 2.5 mm tubing		
Weight	32 g		24 g

FLOW CURVES

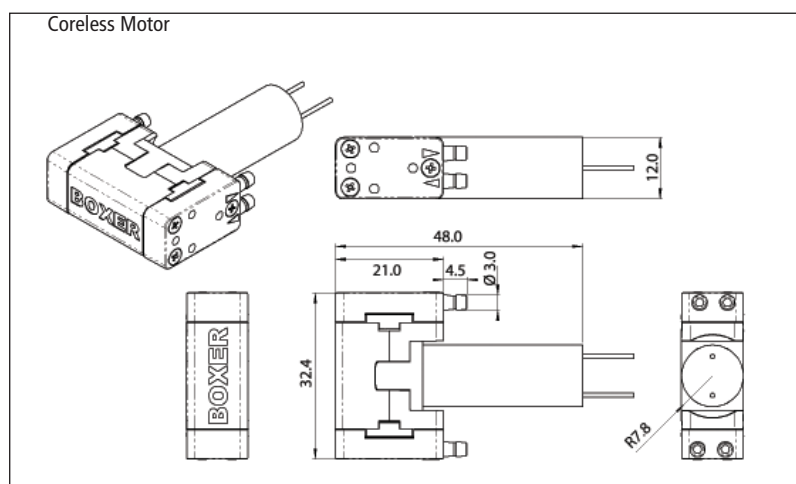
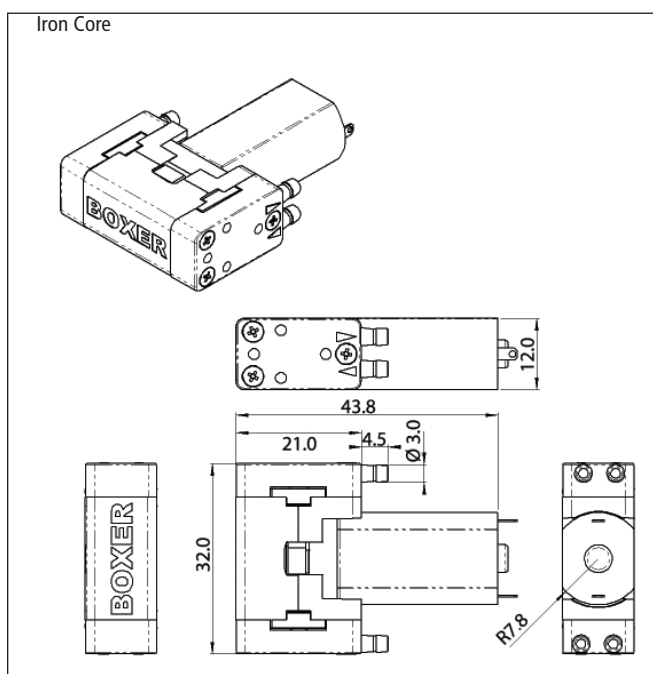


Iron Core Motor



Coreless Motor LF

DIMENSIONS (MM)



ORDERING INFORMATION

Part Number	Description
Iron Core Motor	
20102.001	8.0 V DC / EPDM
Coreless Motor- LF	
20102.002	9.0 -12.0 V DC / EPDM
Accessories	
6900.009	Pulse Width Modulation Flow Controller



LF Twin

With two Coreless Motor- LF units mounted side-by-side a 4 headed pump assembly offers extreme versatility in a width of just 24 mm:

- › 4 independent gas channels
- › multiple series / parallel configuration options (example: 2 heads parallel + series + series to minimize evacuation time)
- › extended life and minimized sound and vibration by sharing the load on 2 slower running pumps

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.

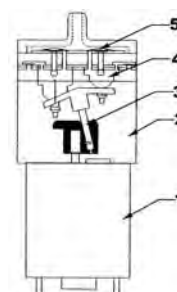
KPMS pumps are remarkably small, with overall length less than 43 mm. In addition to small size and light weight they offer excellent performance considering their very low cost.

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.

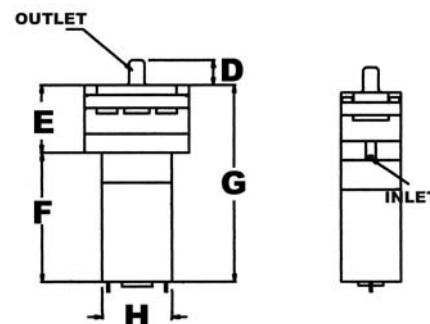
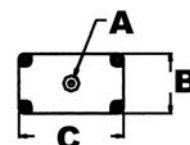


SPECIFICATIONS

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°C	5-45°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

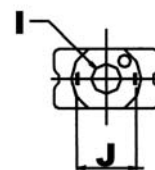
Note: Above dimensions are for general sizing and reference purposes only. Please request specific model drawing for precise dimensions with tolerances.

ORDERING INFORMATION

SELECT MODEL NUMBER

Model
KPM-08A-3A
KPM-12A

These items typically ship from stock



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)

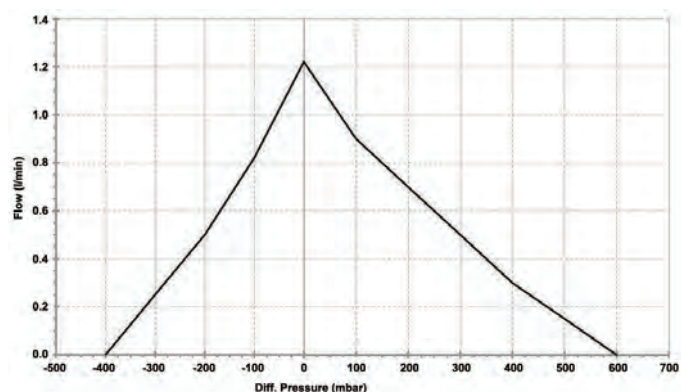
Diaphragm Material: EPDM

Valve Material: Silicone

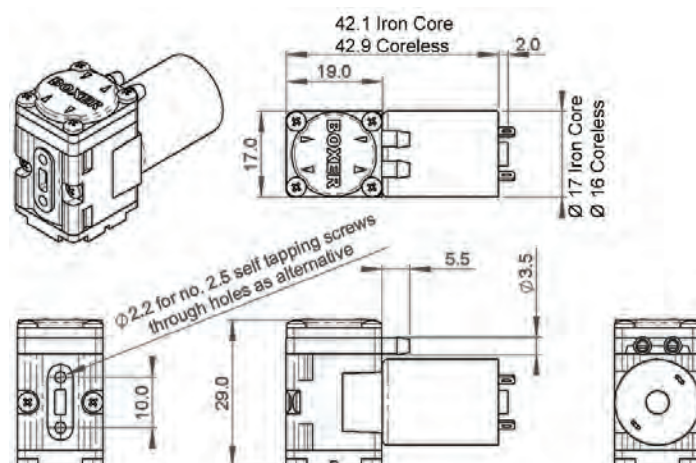
Tubing Connection: 3.5 mm ID tubing

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		

BOXER

22K Series Diaphragm Pump

Gas Flow Rate to 1.4 l/m

DESCRIPTION

22K 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 22K 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. Diaphragms are available not only in different materials but also different thicknesses and profiles depending on the exact needs of the application. Likewise eccentrics from 0.5 to 0.85 mm can be configured.

This series is available in iron core and coreless motor options.

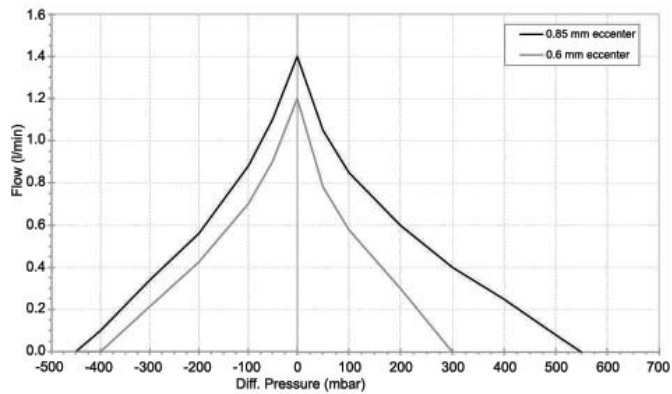


SPECIFICATIONS

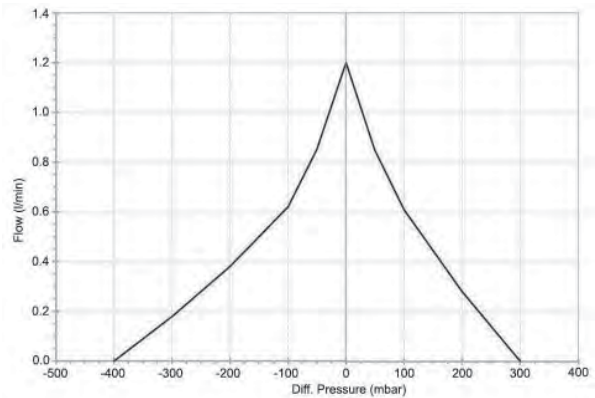
Iron Core Motor Models		
	0.85 mm Eccenter	0.6 mm Eccenter
Free Flow	1.4 l/m	1.2 l/m
Max Pressure	550 mbar	300 mbar
Max Vacuum	-450 mbar	-400 mbar
Power Consumption	0.5-1.6 W	0.5-1.0 W
Voltage Supply	3.0 or 4.5 VDC	
Motor Termination	Solder Tags (no preferred direction)	
Op. Temp. Range	5 to 60°C	
Op. Humidity Range	5 to 95% RH	
Housing Material	PPS	
Diaphragm Material	EPDM	
Valve Material	Silicone	
Tube Connection	Barb for 4 mm ID tubing	
Weight	32 g	

Coreless Motor Models- 0.6 mm Eccenter	
Free Flow	1.2 l/m
Max Pressure	300 mbar
Max Vacuum	-400 mbar
Power Consumption	0.3-1.2 W
Voltage Supply	3.5, 5.0, 6.5 10.0, 13.0 VDC
Motor Termination 3.5, 5.0, 6.5 V Motors	Solder Tags (Marked + and -)
Motor Termination 10.0 & 13.0 V Motors	150 mm Leads (Red & Black)
Op. Temp. Range	5 to 60°C
Op. Humidity Range	5 to 95% RH
Housing Material	PPS (Polyphenylene Sulphide)
Diaphragm Material	EPDM
Valve Material	Silicone
Tube Connection	Barb for 4 mm ID tubing
Weight	36 g

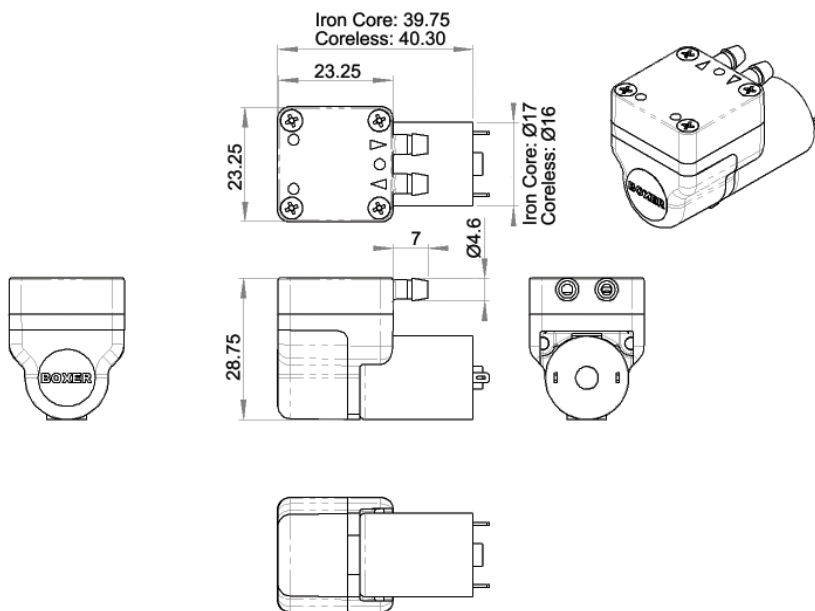
FLOW PERFORMANCE IRON CORE MOTOR MODELS



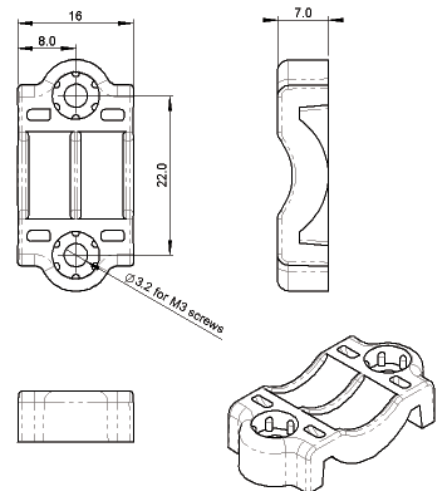
FLOW PERFORMANCE CORELESS MOTOR MODELS



DIMENSIONS (MM)



22000.001 Mounting Bracket



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Eccentric (mm)
22000.005	Iron Core	3.0	0.85
22000.006	Iron Core	4.5	0.85
22000.010	Iron Core	3.0	0.6
22000.011	Iron Core	4.5	0.6
221000.001	Coreless	3.5	0.6
22100.003	Coreless	5.0	0.6
22100.005	Coreless	6.5	0.6
22100.007	Coreless	10.0	0.6
22100.009	Coreless	13.0	0.6
22000.001	Mounting Bracket		

BOXER

1K Series Diaphragm Pump

Gas Flow Rate to 1.8 l/m

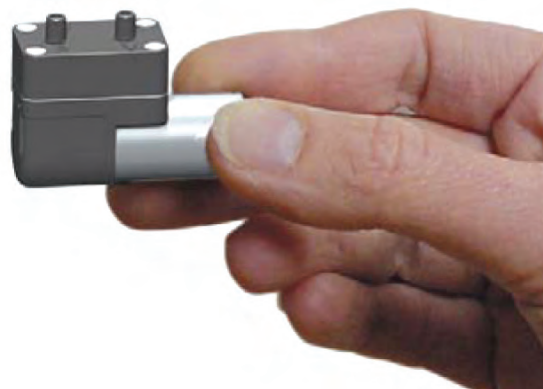
DESCRIPTION

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)

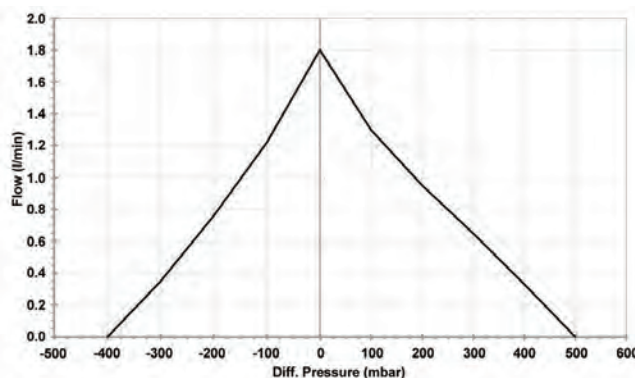
Diaphragm Material: EPDM

Valve Material: Silicone

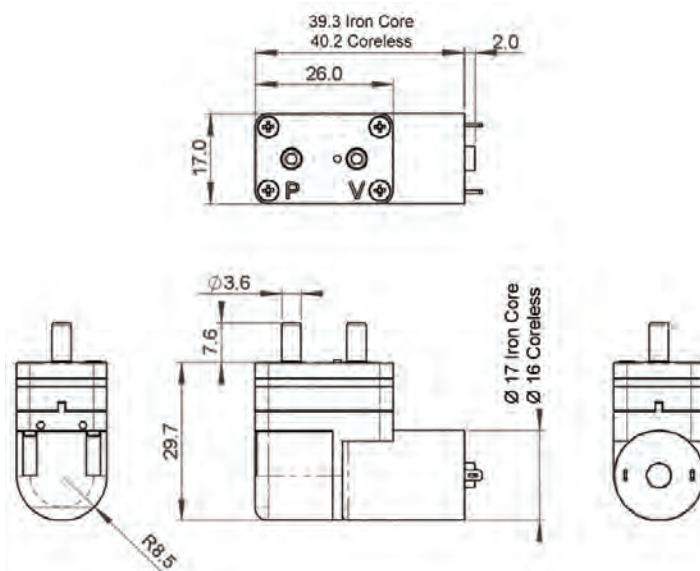
Tubing Connection: 3 mm ID tubing

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		

BOXER

22KD Series Diaphragm Pump

Gas Flow Rate to 2.6 l/m

DESCRIPTION

The 22KD series is a double headed miniature diaphragm pump designed for a wide range of applications including gas sampling, gas detection and monitoring. This pump series is of certain interest for applications requiring flow above 2 l/min in a compact envelope. Additionally, when run at lower speeds with a flow of 1 l/min and below, sound and vibration is reduced to levels which cannot be matched with a single headed pump.

Like all other pumps in the Boxer range, this series of miniature diaphragm pump can be customized to specific requirements. Diaphragms are available not only in different materials but also different thicknesses and profiles depending on the exact needs of the application. Likewise eccentrics from 0.5 to 0.85 mm can be configured.

This series is available with either iron core or BLDC motors.

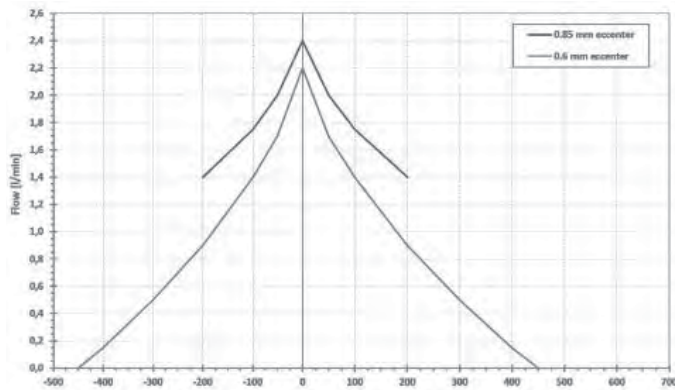
- › Flow rate to 2.6 l/min
- › Low sound and vibration
- › BLDC motor option with speed input for ultimate flow control
- › Compact and versatile
- › Antivibration mounting foot available

Flow control is available in combination with PWM Flow Controller.

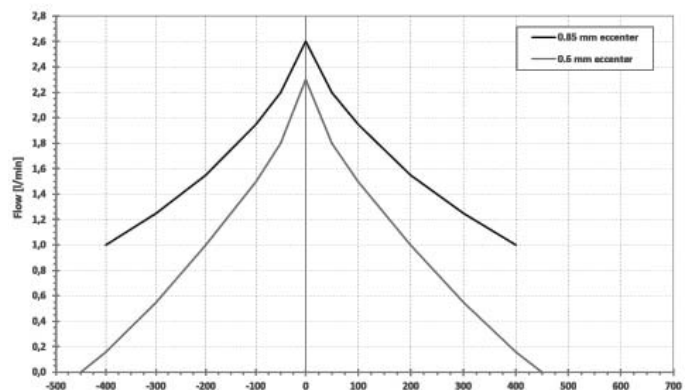


SPECIFICATIONS	Iron Core Motor	BLDC Motor
Voltage Options	3.5/4.5 V DC	24V DC
Power Consumption 0.85 mm Eccenter	0.7 to 1.6 W	2.0 to 3.0 W
Power Consumption 0.6 mm Eccenter	0.5 to 1.6 W	2.0 to 3.0 W
Free Flow 0.85 mm Eccenter	2.4 l/min	2.6 l/min
Free Flow 0.6 mm Eccenter	2.2 l/min	2.3 l/min
Max Pressure 0.85 mm Eccenter	200 mbar	400 mbar
Max Pressure 0.6 mm Eccenter	450 mbar	450 mbar
Max Vacuum 0.85 mm Eccenter	-200 mbar	-400 mbar
Max Vacuum 0.6 mm Eccente	-450 mbar	-450 mbar
Motor Termination	Solder Tags	45 cm leads terminated with connection for BLDC Driver
Oper. Temp. Range	5 to 60°C	
Oper. Humidity Range	5 to 95% RH	
Elastomer Options	EPDM, Silicone	

FLOW CURVES

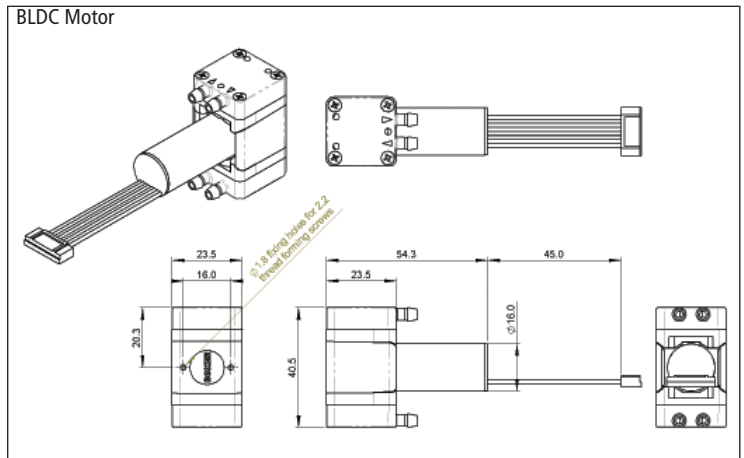
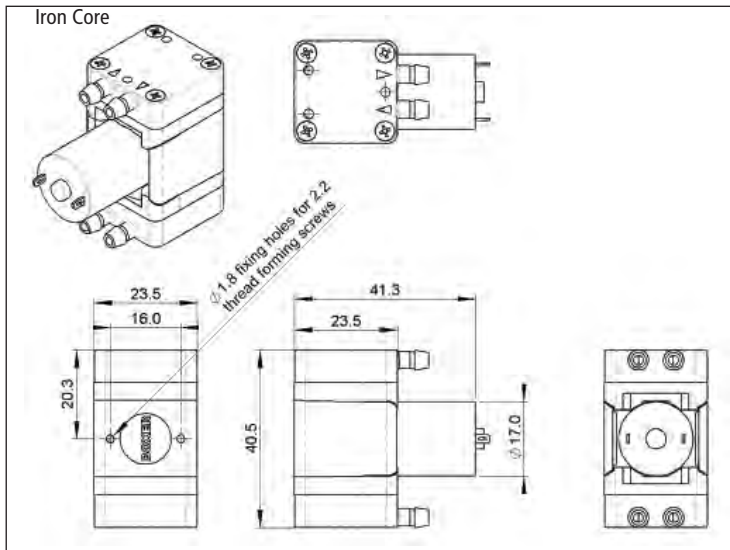


Iron Core Motor



BLDC Motor

DIMENSIONS (MM)



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.

ORDERING INFORMATION

Iron Core Motor

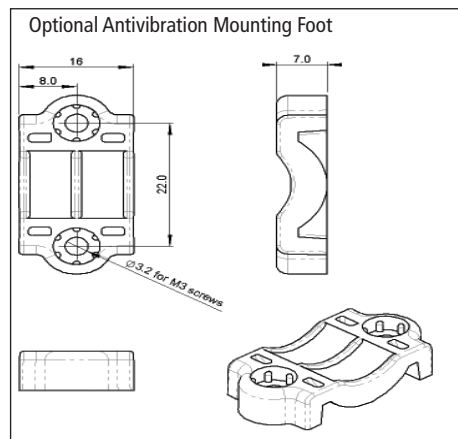
Part Number:	22002.004	3.0 V DC / EPDM	0.85 mm eccentric
Part Number:	22002.006	4.5 V DC / EPDM	0.85 mm eccentric

Part Number:	22002.003	3.0 V DC / EPDM	0.6 mm eccentric
Part Number:	22002.005	4.5 V DC / EPDM	0.6 mm eccentric
Part Number:	6900.009	Pulse Width Modulation Flow Controller	

BLDC Motor

Part Number:	22602.002	24 V DC / EPDM	0.85 mm eccentric
Part Number:	22602.001	24 V DC / EPDM	0.6 mm eccentric
Part Number:	6900.005	Driver Board for BLDC Motors	

Part Number:	22000.3001	Optional antivibration mounting foot	
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BOXER

12KD Series Diaphragm Pump

Gas Flow Rate to 2 l/m

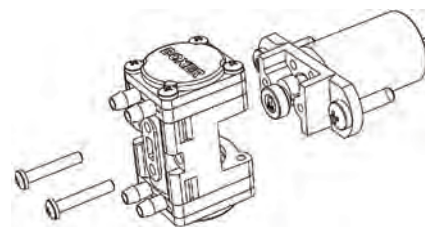
DESCRIPTION

The 12KD series is a double headed version of the series 12K pumps for increased flow performance. The pumps feature unique exchangeable heads and panel mounting.

Once contaminated replacement of all wetted parts takes only a few seconds with removal of two screws. The panel mounted motor remains inside of the instrument.

2 heads allows flexibility of parallel or series connection to extend the pressure / vacuum capability or to pump 2 distinct gases.

Like all other pumps in the Boxer range, this series can be customized to specific requirements. 12KD pumps are available with iron core or coreless motors.



SPECIFICATIONS

GENERAL

Free Flow Parallel /Series configuration: 2/1.2 liters/min
 Max Pressure Parallel /Series config.: 600/900 mbar
 Max Vacuum Parallel /Series config.: -400/-600 mbar
 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)

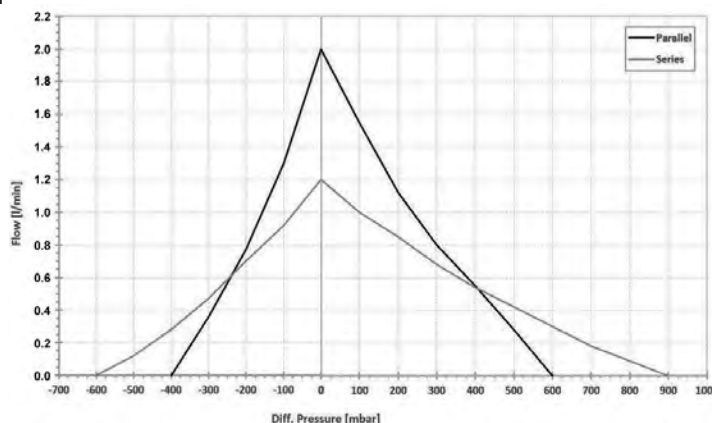
Diaphragm Material: EPDM

Valve Material: Silicone

Tubing Connection: 2.5 mm ID tubing

Weight; 35g

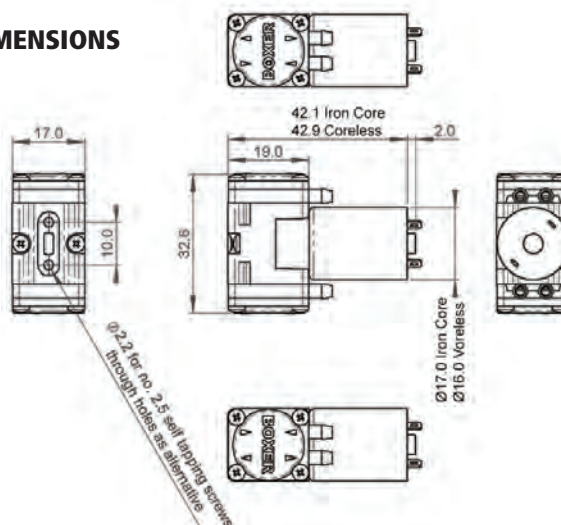
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



ORDERING INFORMATION

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
1212.204	Iron Core	4.5	4.5
1212.205	Iron Core	6.5	6.5
1212.124	Coreless	4	6
1212.125	Coreless	7	9
1212.126	Coreless	9	12
1212.123	Coreless	13.5	18
1212.106	Coreless	18	24

DIMENSIONS



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 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 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

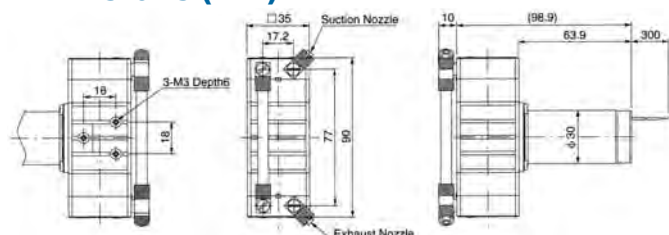
Motor: Namiki 24VDC brushless with integrated sensor drive circuit type

Nominal Current Consumption: 200 mA

Weight: 360g



DIMENSIONS (MM)



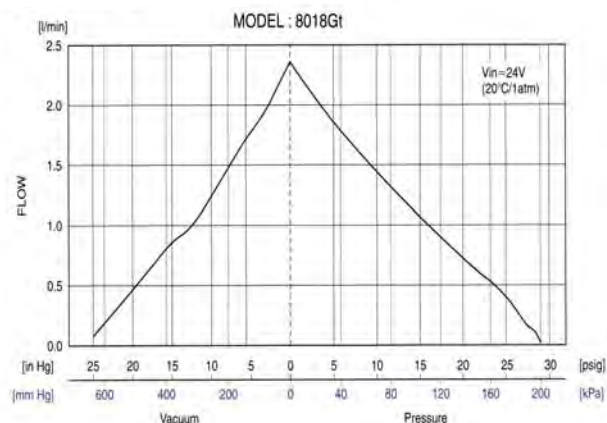
ORDERING INFORMATION

ORDER NUMBER

8018GT

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

FLOW CURVE



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.

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.



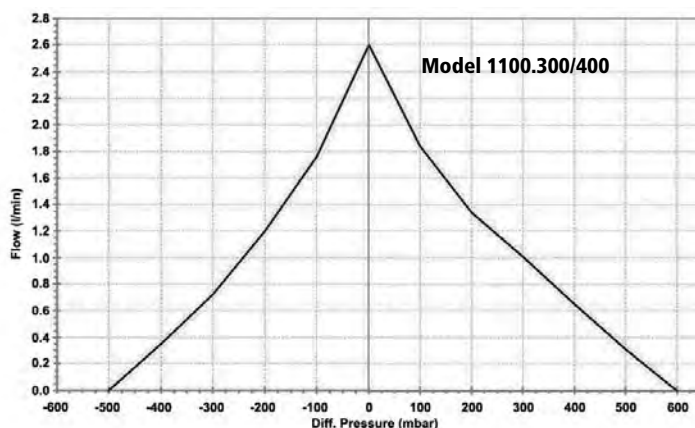
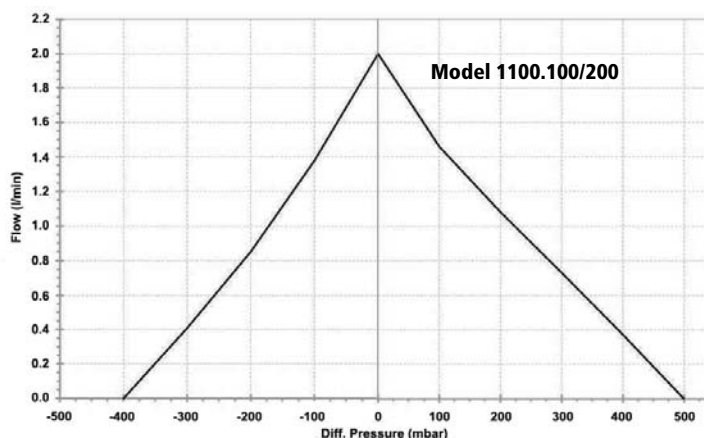
Model 1100.200



Model 1100.300 with Driver Board

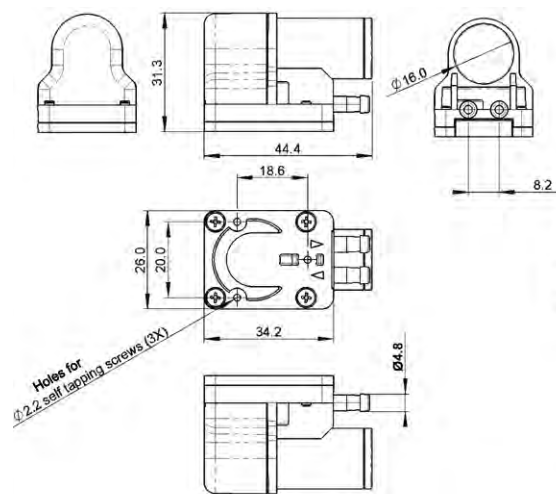
	Model 1100.100	Model 1100.200	Model 1100.300/400
Motor	Coreless: 4, 7, 9 & 13.5 VDC	Iron Core: 12 & 24 VDC	Brushless: 24VDC
Free Flow	2 LPM (at 75% nominal pump voltage)	2 LPM	2.6 LPM- Regulation of flow via on-board trimmer
Max Pressure-Gas	225 mBar	500 mBar	600 mBar
Max Vacuum-Gas	-225 mBar	-400 mBar	-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)

FLOW CURVES

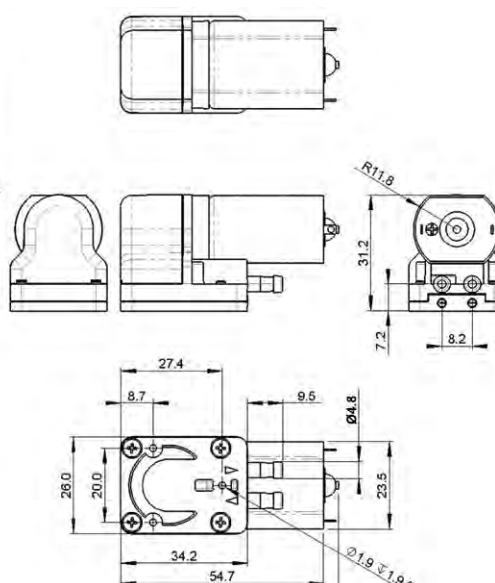


DIMENSIONS (MM)

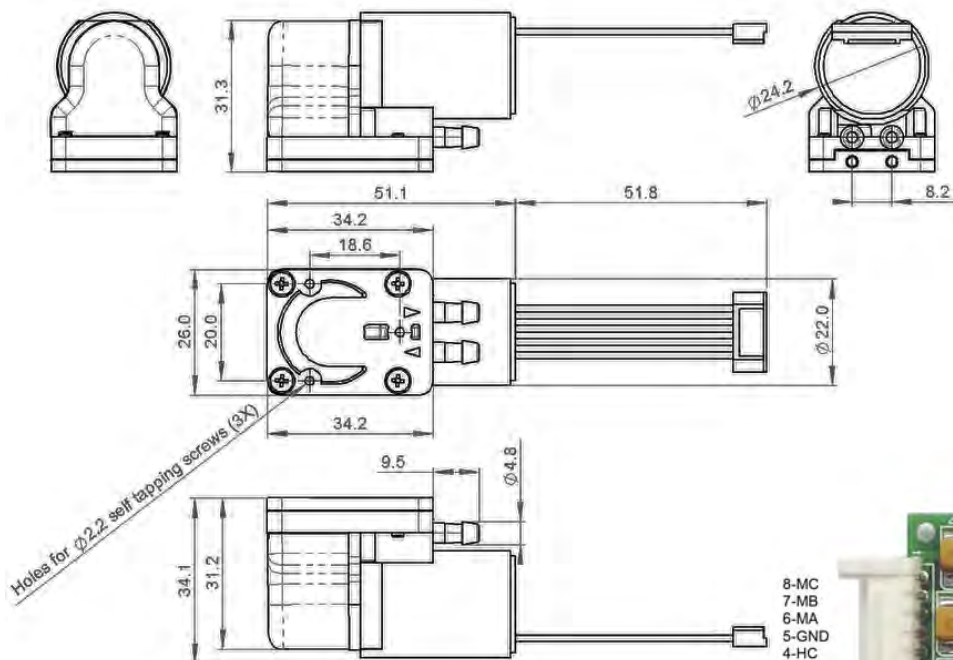
Model 1100.100



Model 1100.200

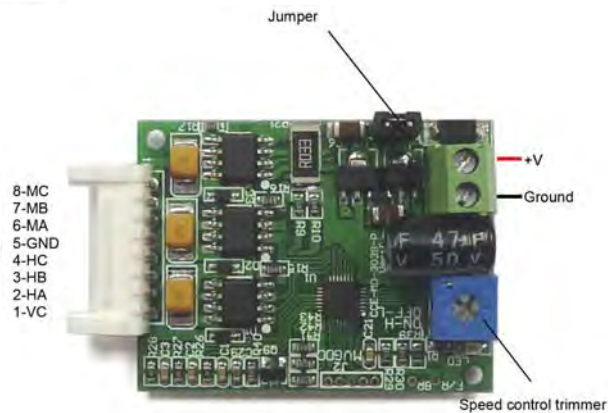


Model 1100.300/400



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 to 150 mmHg

DESCRIPTION

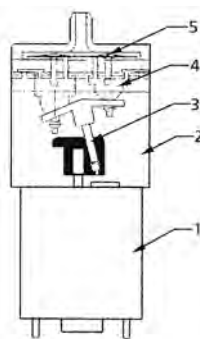
The KPV series pumps incorporate two mini-diaphragms operated by a rocker arm attached to an eccentric on a motor shaft. The function is simple and reliable.

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	5-45°C	5-45°C
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

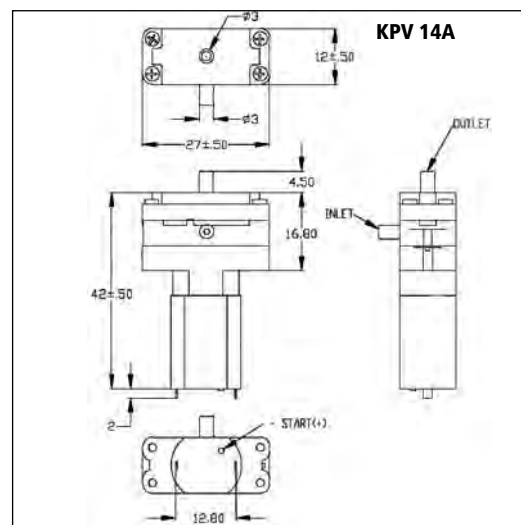
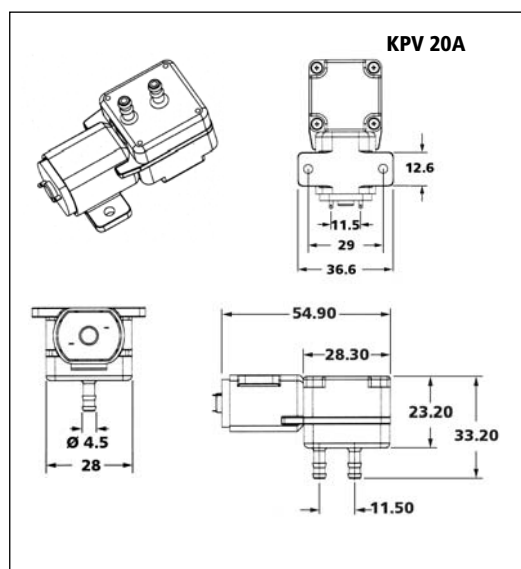
KPV-14A6V

KPV-20A6V

Items typically ship from stock



DIMENSIONS (MM)



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.

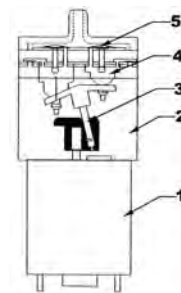
KPMR pumps are remarkably small, with overall length less than 65 mm. In addition to small size and light weight they offer excellent performance considering their very low cost.

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.

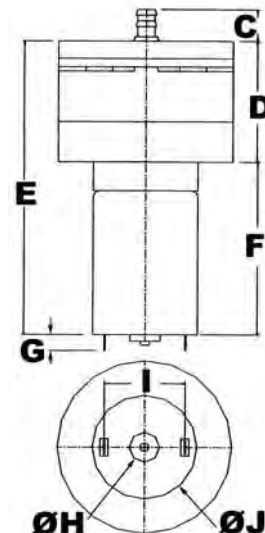
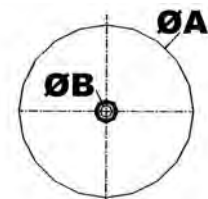


SPECIFICATIONS

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°C	5-45°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.



- 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-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

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 parallel 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

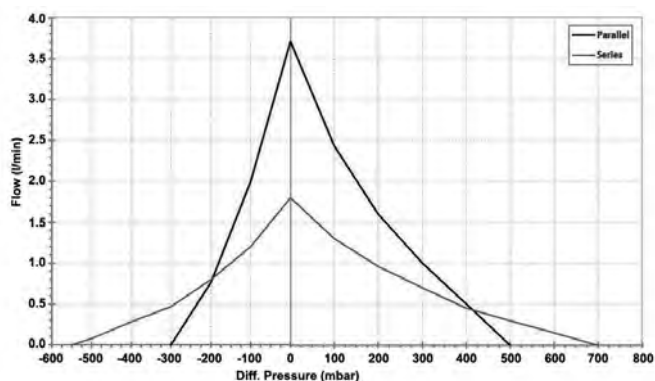
Valve Material: Silicone

Tubing Connection: 3.5 mm ID tubing

Weight; 35g



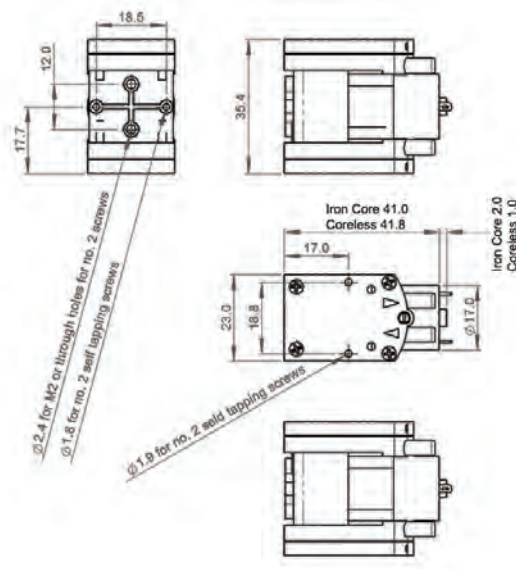
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



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)



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)

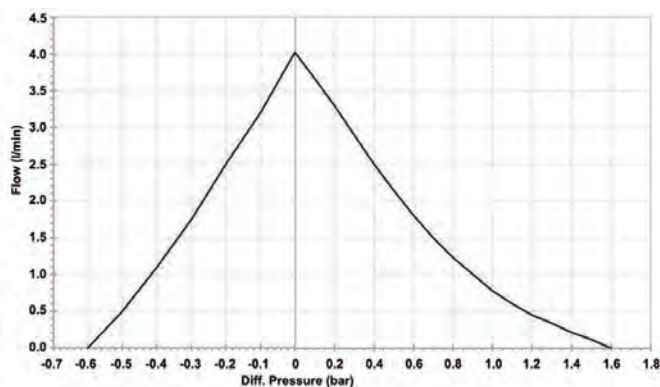
Diaphragm Material: EPDM

Valve Material: Silicone

Tubing Barb Size: 5 mm OD

Weight; 173g

FLOW CURVE

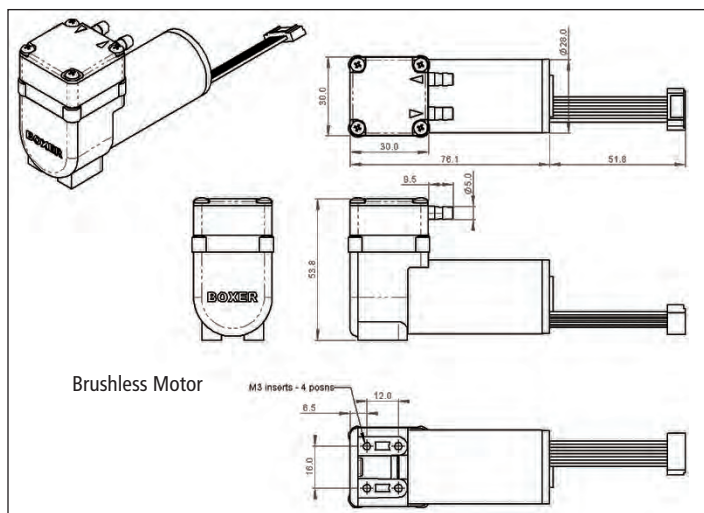
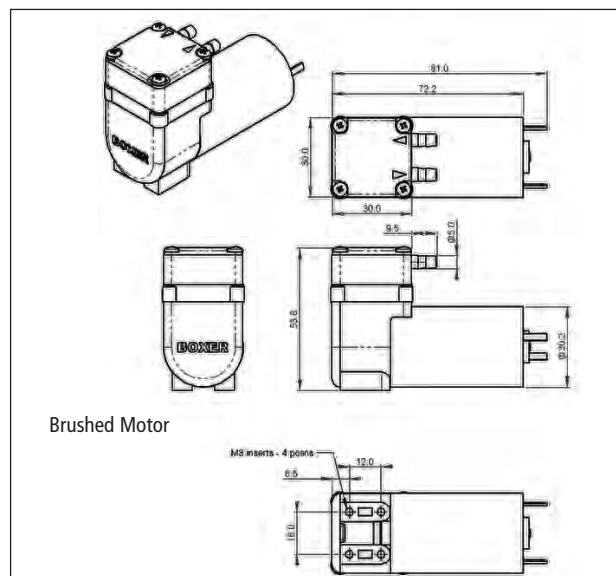


ORDERING INFORMATION

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		



DIMENSIONS (MM)



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)

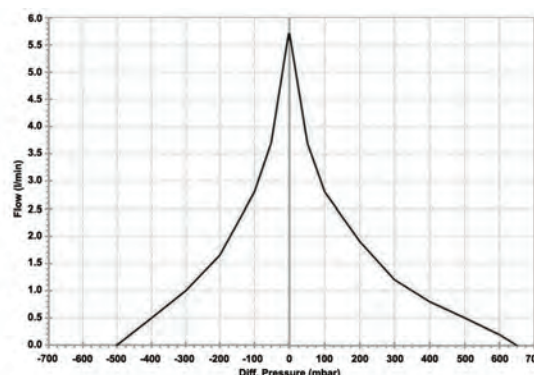
Mounting- Mounting clip supplied

ORDERING INFORMATION

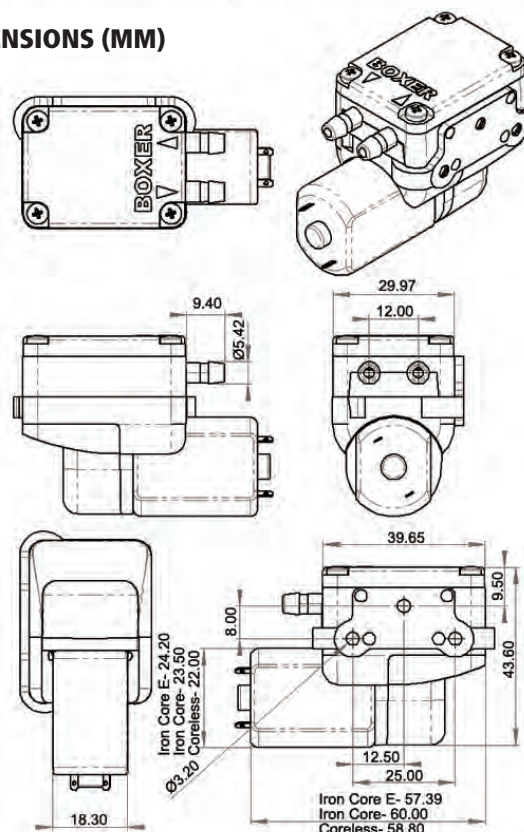
Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
5211.901	Iron Core-E	12	12
5311.901	Iron Core	12	12
5311.902	Iron Core	24	24
5101.906	Coreless	6	6



FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



DIMENSIONS (MM)



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 parallel 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)

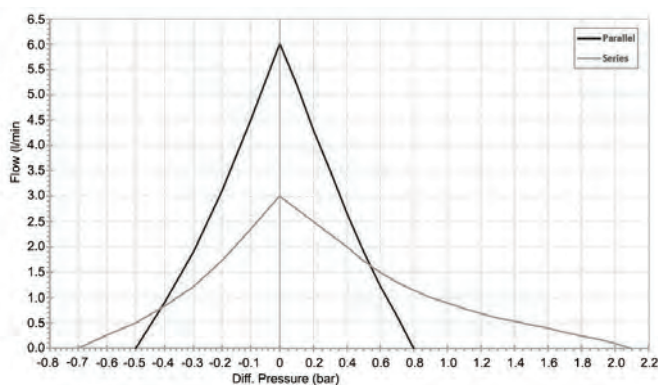
Diaphragm Material: Nitrile

Valve Material: Silicone

Tubing Barb Size: 5 mm OD

Mounting Bracket: Included

FLOW CURVE



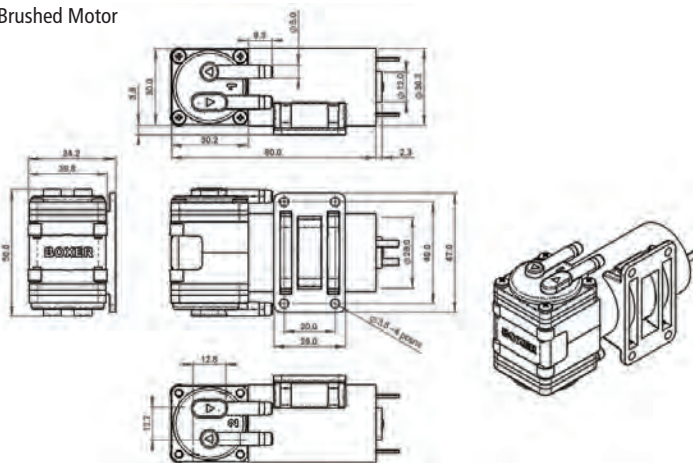
ORDERING INFORMATION

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		

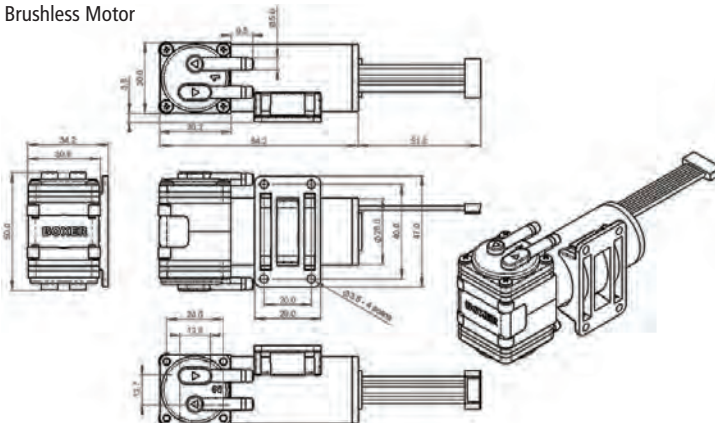


DIMENSIONS (MM)

Brushed Motor



Brushless Motor



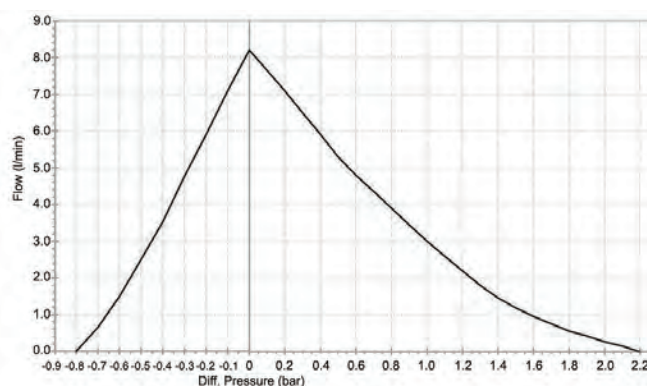
DESCRIPTION

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

SPECIFICATIONS

GENERAL

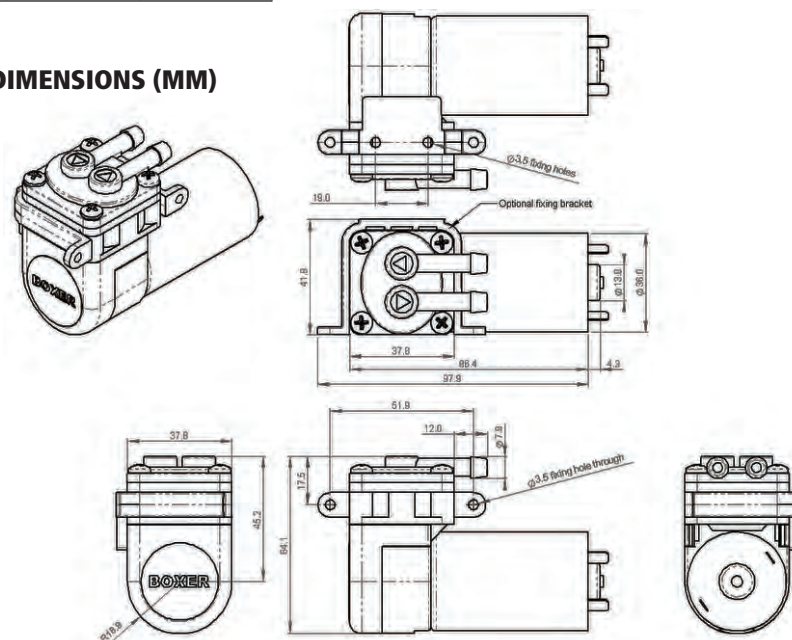
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



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)



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.

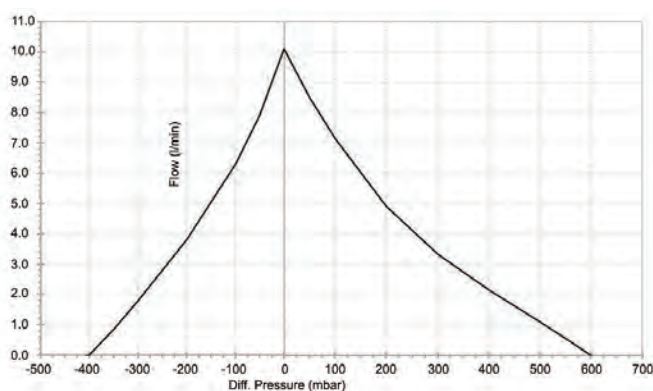


SPECIFICATIONS

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

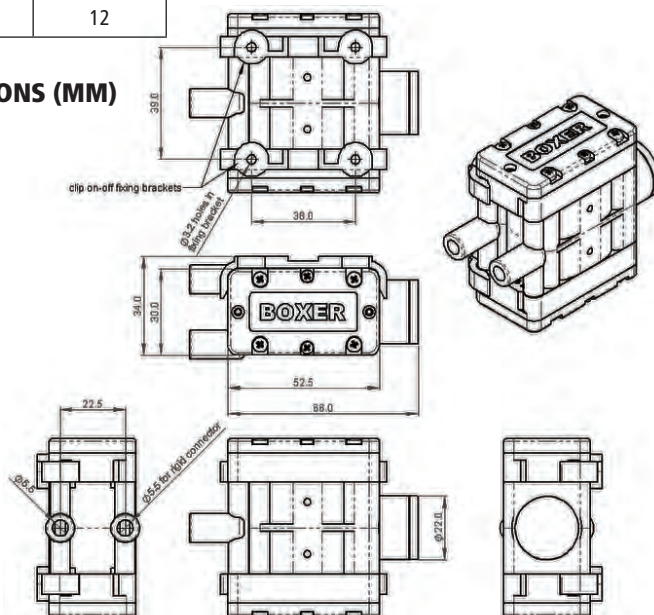
FLOW PERFORMANCE (AT NOMINAL PUMP VOLTAGE)



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)



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 available for reduced performance

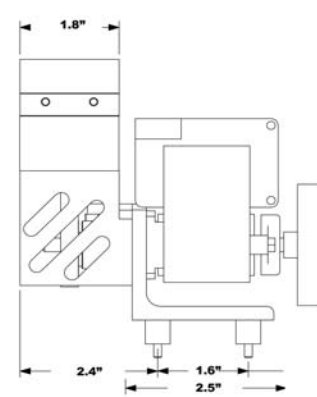
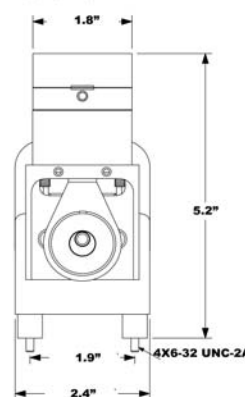
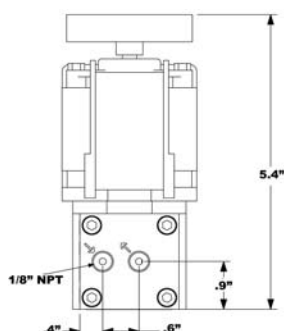
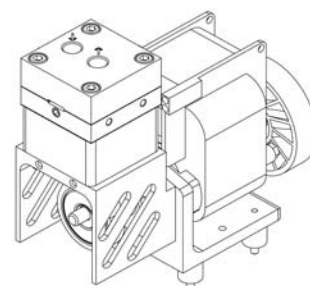
Weight

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

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 economically 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

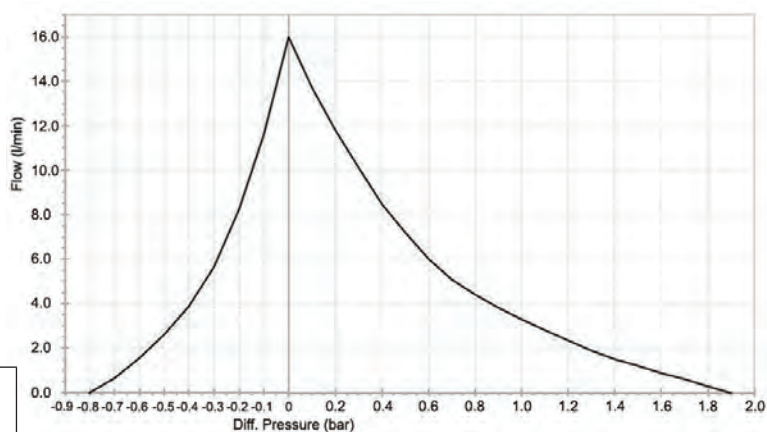
GENERAL

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

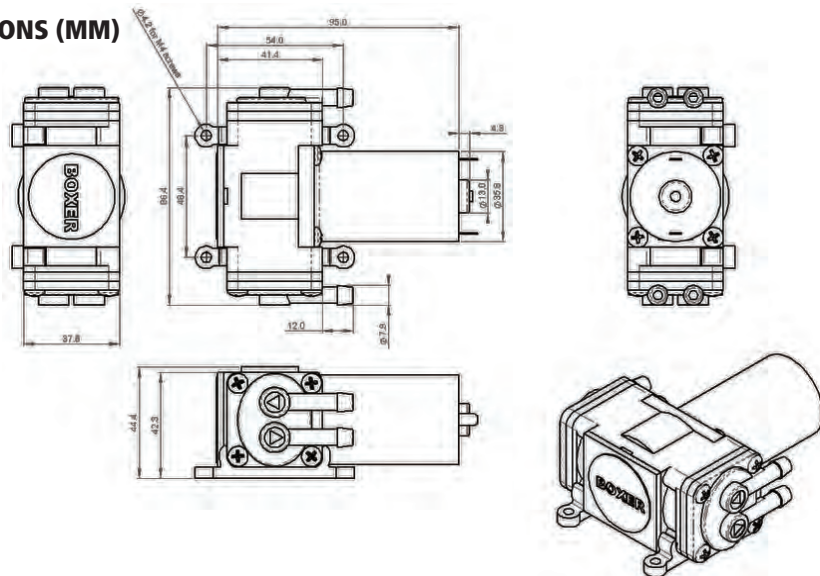
ORDERING INFORMATION

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

FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)



DIMENSIONS (MM)



Gas Flow Rate to 28 l/m

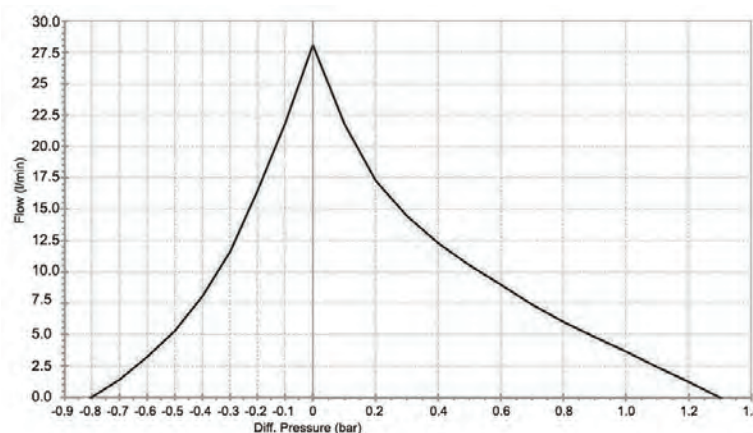
The 3KQ series quad headed diaphragm pumps have a unique design and high performance to size ratio. This series additionally offers a unique detachable motor construction allowing contaminated heads to be economically exchanged.

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



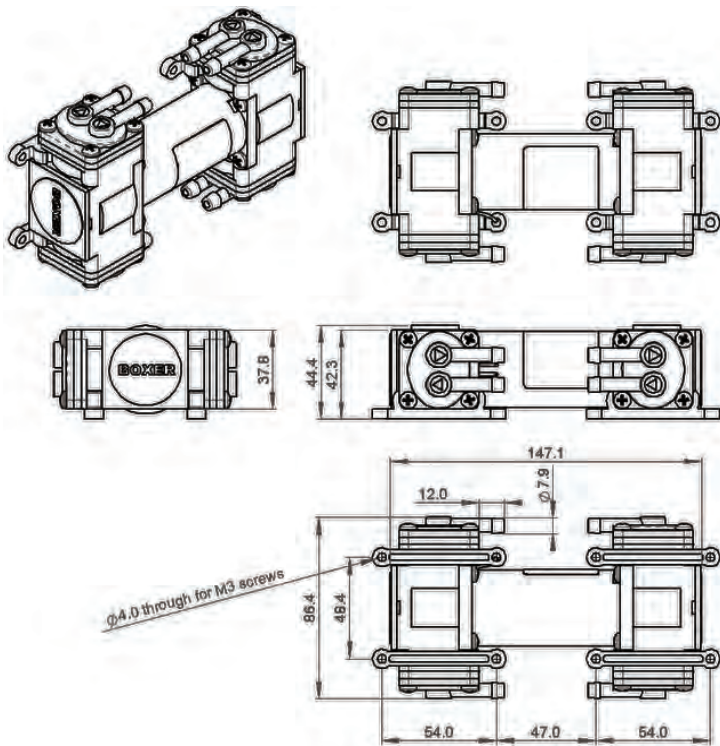
FLOW PERFORMANCE (PARALLEL PUMP HEAD CONFIGURATION)

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



DIMENSIONS (MM)

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
3114.129	Brushed	12	12
3114.252	Brushed	24	24



Gas Flow Rate to 32 l/m

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 combustion gas analysis. The overall construction is extremely robust.

Vibration mounts are fitted as standard.

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

Diff. Pressure (mbar)	Flow (l/min)
-400	14
-300	16
-200	19
-100	24
0	32
100	24
200	19
300	16
400	13
500	9
600	7

Model	Motor Type	Nominal Pump Voltage (VDC)	Nominal Motor Voltage (VDC)
7502.012	Brushed	12	12
7502.024	Brushed	24	24



DIMENSIONS (MM)

Technical drawing of the VE200-01 motor showing various views and dimensions:

- Top View:** Shows the motor housing with dimensions 66.2 (width), 73.4 (length to start of connector), 95.0 (length to end of connector), and 66.2 (width to end of connector). The connector has a diameter of $\varnothing 25$ and a length of 51. The mounting flange has a diameter of $\varnothing 6.2$ and a thickness of 9.5. The base has a thickness of 3.6.
- Front View:** Shows the motor housing with dimensions 85.8 (height to top of connector) and 80.6 (height to top of motor housing).
- Side View:** Shows the motor housing with a dimension of 53.0 (height to top of motor housing).
- Bottom View:** Shows the motor housing with dimensions 73.4 (length to start of connector) and 95.0 (length to end of connector).
- Connector View:** Shows the connector with a diameter of $\varnothing 8.0$ for the rigid connector.

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 combustion 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)

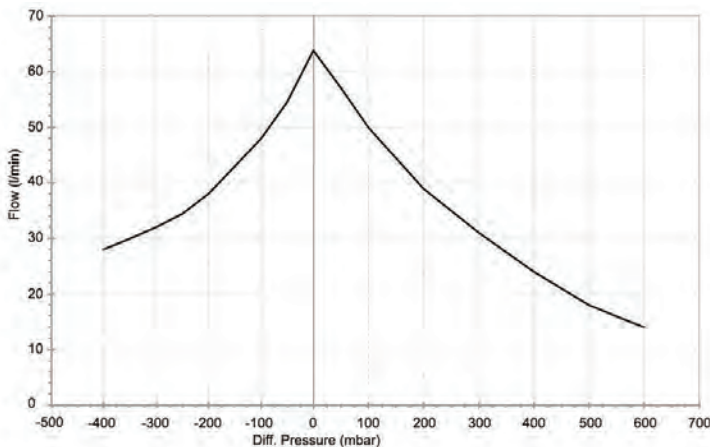
Diaphragm Material: Nitrile

Valve Material: Nitrile

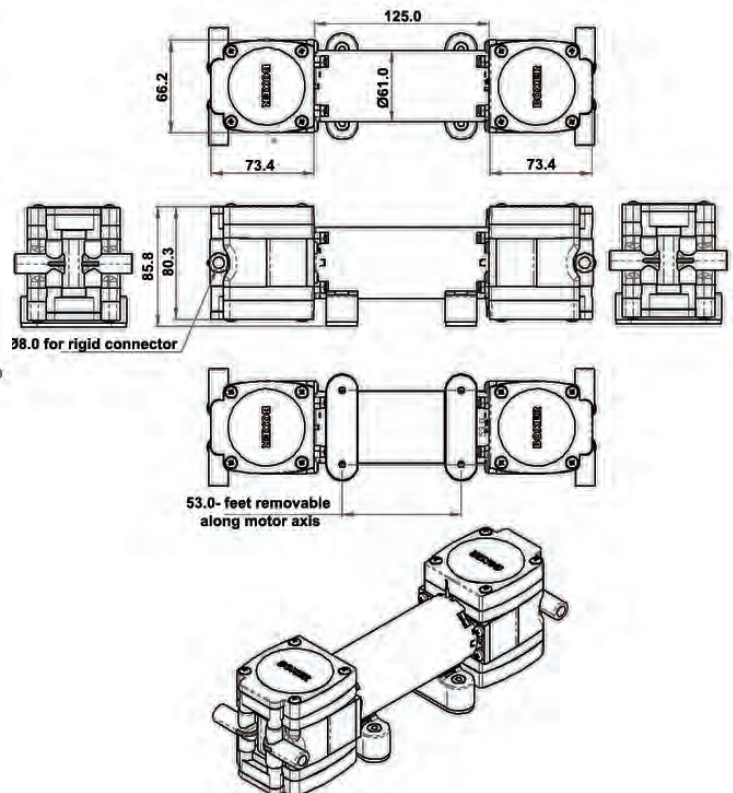
Tubing Connection: Barb for 6mm to 8 mm ID tube

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)

BOXER**Model DC 3K Pulse Width Modulation Flow Controller**

For use with Boxer DC motor driven diaphragm & peristaltic pumps

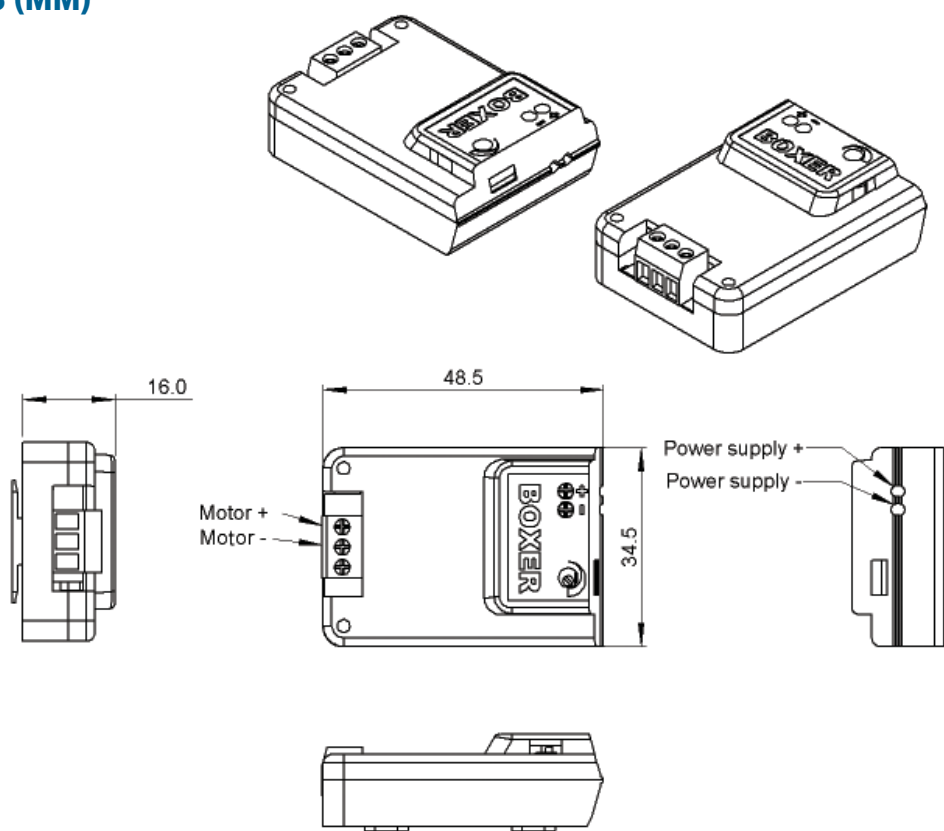
DESCRIPTION

Model DC 3K PWM flow controller is designed specifically as a driver circuit for Boxer DC motor driven pumps.

With a constant DC supply voltage, the output can be varied between 0 and 100% through an on-board potentiometer providing optimal flow control of both Boxer diaphragm and peristaltic pumps.

**SPECIFICATIONS**

Input Voltage	12-24 VDC
Maximum Load	2 A
Fuse	3 A timed, non-resetting
Duty Cycle	0 to 100%
Duty Cycle Adjustment	On-board 15 turn potentiometer
PWM Frequency	10 kHz (nominal)
Mounting	DIN Rail TS-15/5.5/1.0

DIMENSIONS (MM)**ORDERING INFORMATION**

Part Number: 6900.009 PWM Flow Controller

FURGUT

Pressure/Vacuum Pump Model Series 50L

DC Powered Rotary Vane Pumps, Gas Flow to 6.7 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- 1700 mbar

Maximum Flow- 6.7 LPM

Vane Material- Carbon

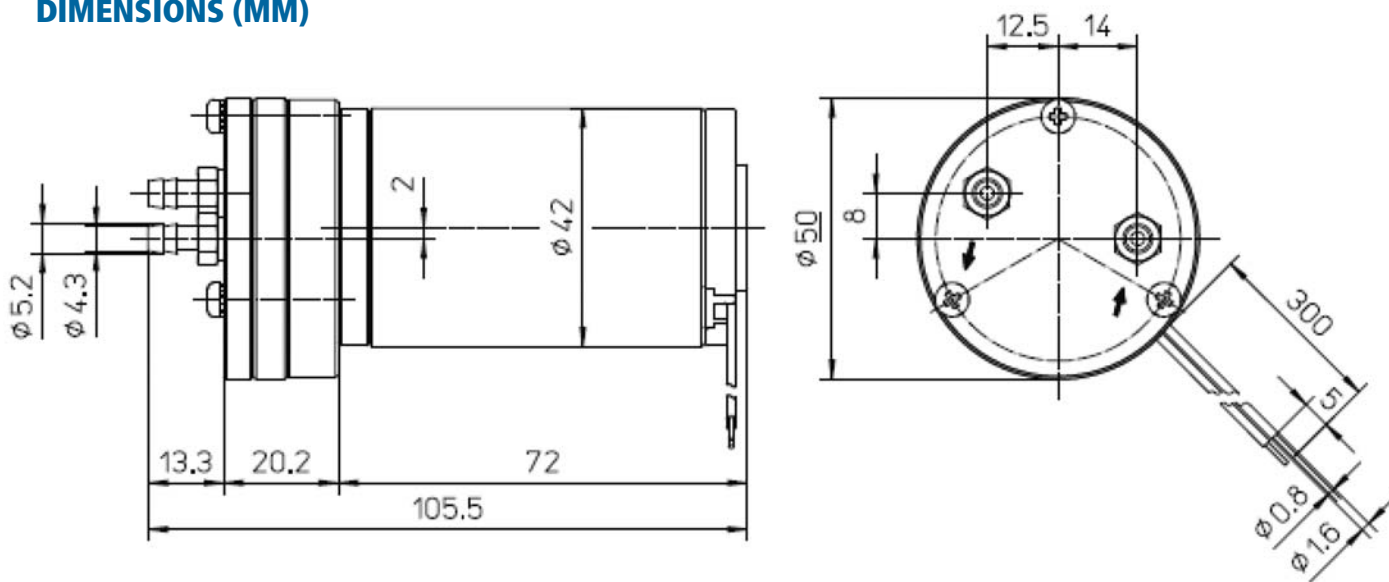
Media- Inert non-explosive gases

NOTE

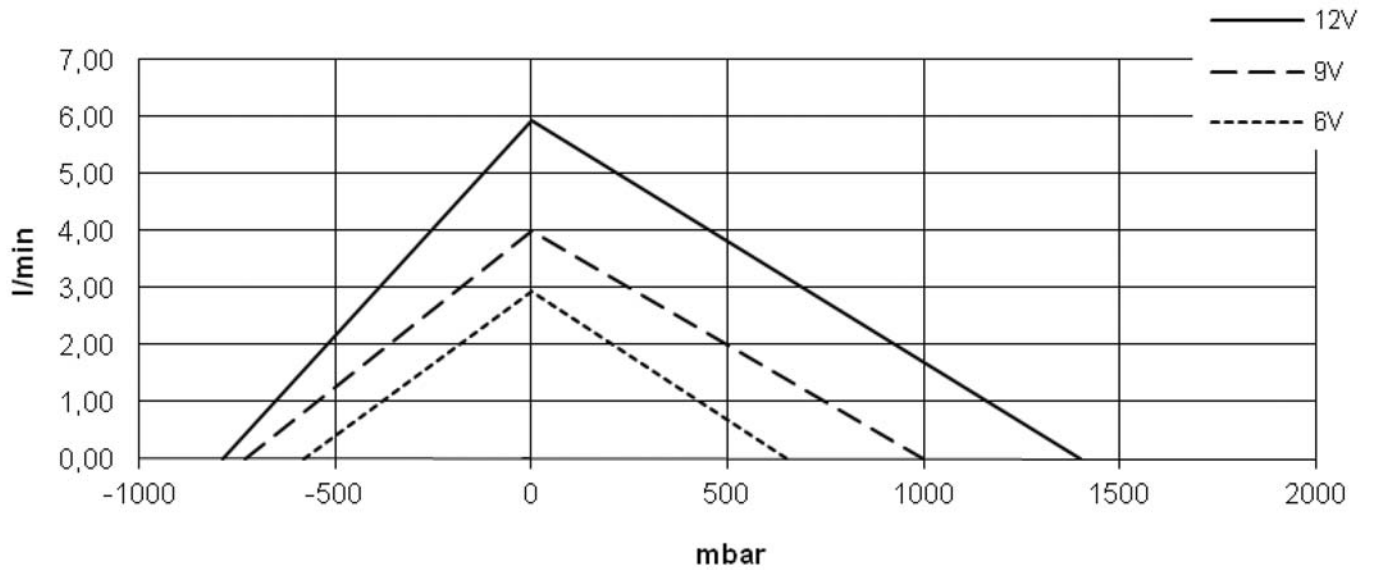
Operation at a somewhat lower than pump design voltage will yield a significantly longer life of the motor and the pump while also decreasing the current draw and operating noise of the unit.

If used for continuous operation, we recommend selection of a pump that has a slightly higher pumping capacity than needed during normal operation.

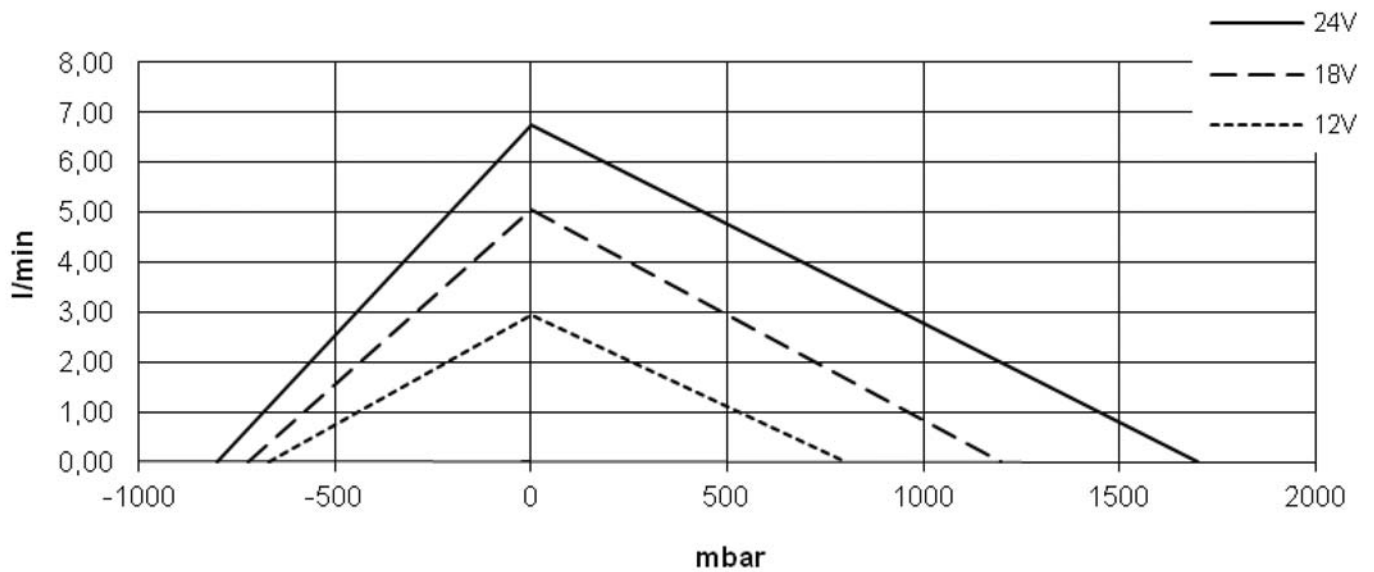
DIMENSIONS (MM)



Type/Model: DC12/50L



Type/Model: DC24/50L



ORDERING INFORMATION

Model/ Order Code	Nominal Current (A)	Voltage (V)	Max. Flow (L/min)	Vacuum				Pressure				Weight (kg)
				Current		Vacuum (mbar)	Noise Level (dBA)	Current		Pressure (mbar)	Noise Level (dBA)	
				Min (A)	Max (A)			Min (A)	Max (A)			
DC12/50L No. 15951	1.9	12.0	5.9	1.0	1.7	790	82	1.0	3.8	1400	71	0.65
		9.0	4.0	0.8	1.6	730	79	0.8	2.9	1000	65	
		6.0	2.9	0.7	1.6	580	70	0.7	1.9	650	57	
DC24/50L No. 16952	0.9	24.0	6.7	0.5	0.9	800	84	0.6	1.9	1700	73	
		18.0	5.0	0.4	0.8	720	81	0.5	1.4	1200	67	
		12.0	2.9	0.4	0.7	670	73	0.4	0.9	800	62	

FURGUT

Pressure/Vacuum Pump Model Series 80L

DC Powered Rotary Vane Pumps, Gas Flow to 8.6 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- 1300 mbar

Maximum Flow- 8.6 LPM

Vane Material- Carbon

Media- Inert non-explosive gases

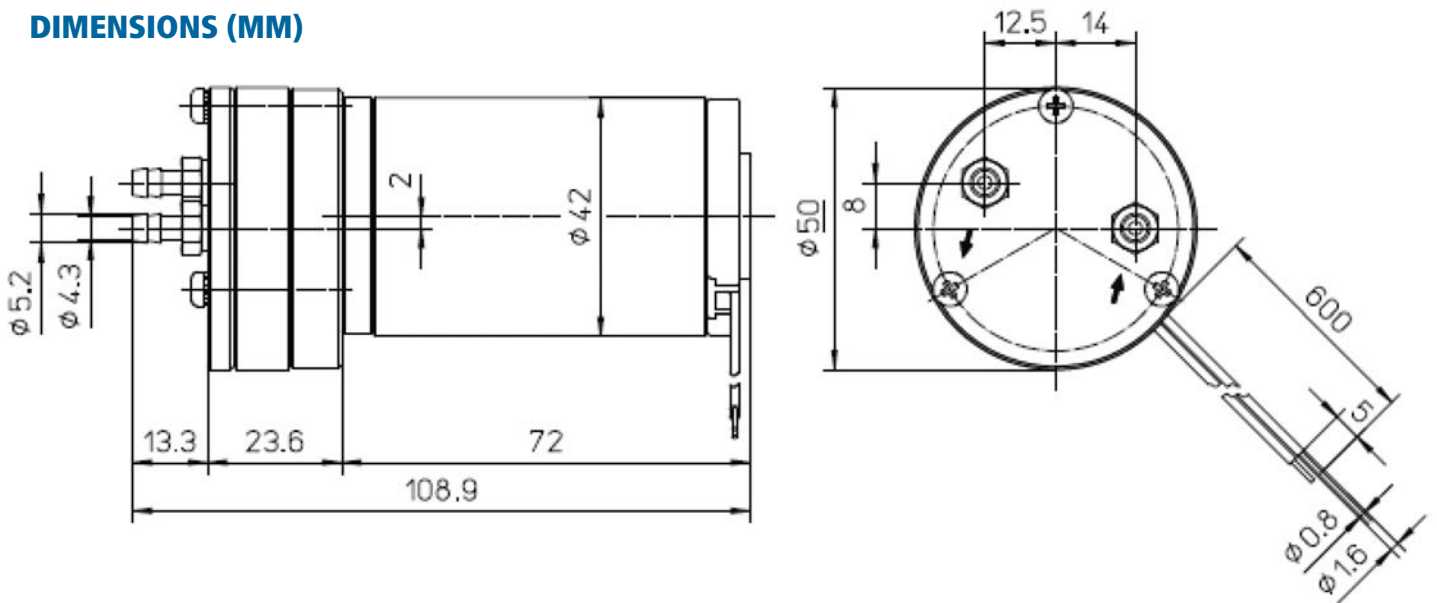
NOTE

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.

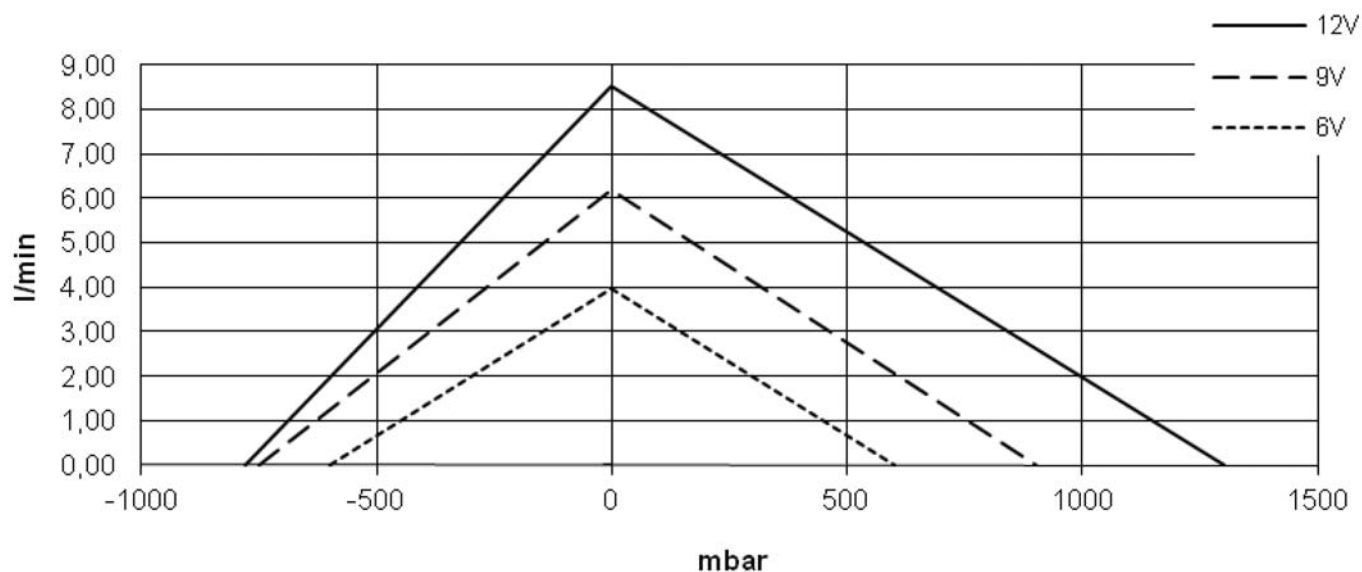
If used for continuous operation, we recommend selection of a pump that has a slightly higher pumping capacity than needed during normal operation.



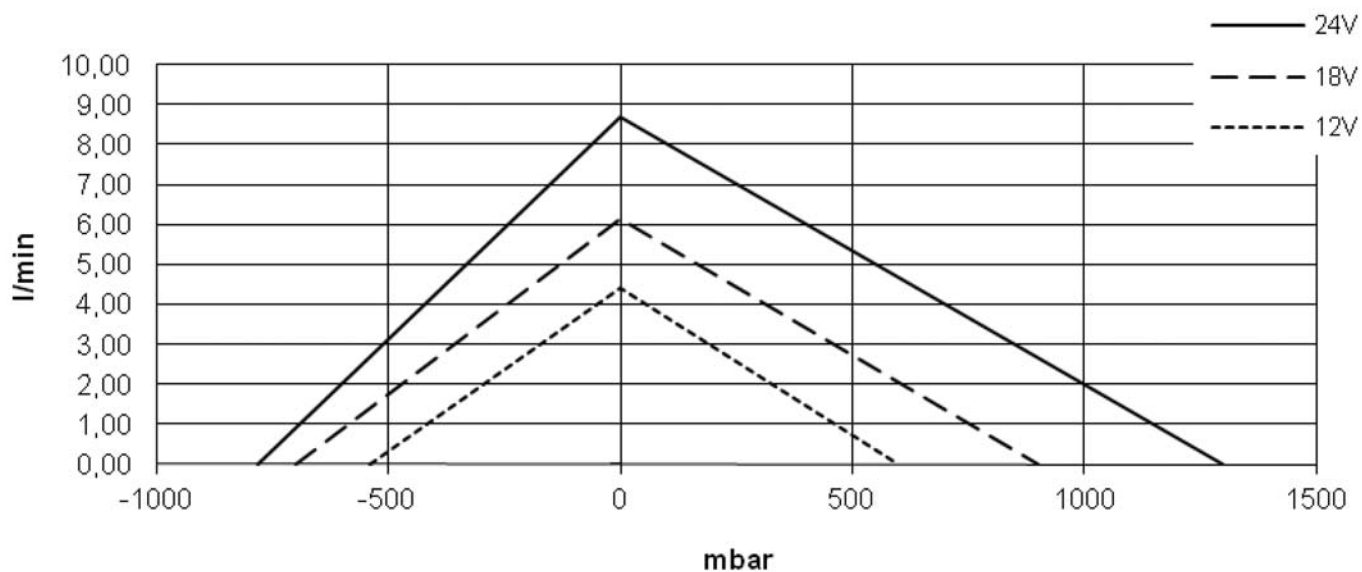
DIMENSIONS (MM)



Type/Model: DC12/80L



Type/Model: DC24/80L



ORDERING INFORMATION

Model/ Order Code	Nominal Current (A)	Voltage (V)	Max. Flow (L/min)	Vacuum				Pressure				Weight (kg)
				Current		Vacuum (mbar)	Noise Level (dBA)	Current		Pressure (mbar)	Noise Level (dBA)	
				Min (A)	Max (A)			Min (A)	Max (A)			
DC12/80L No. 15982	1.9	12.0	8.5	1.4	2.0	780	78	1.3	4.3	1300	81	0.69
		9.0	6.1	1.1	1.9	750	74	1.1	3.3	900	73	
		6.0	3.9	0.8	1.6	600	66	0.8	2.1	600	64	
DC24/80L No. 16984	0.9	24.0	8.5	0.6	1.0	700	81	0.6	2.1	1300	72	
		18.0	6.1	0.5	1.0	700	77	0.5	1.8	900	67	
		12.0	4.4	0.4	0.8	540	70	0.4	1.1	600	58	

FURGUT

Pressure/Vacuum Pump Model Series 90SL

DC Powered Rotary Vane Pumps, Gas Flow to 13 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- 1700 mbar

Maximum Flow- 13 LPM

Vane Material- Carbon

Media- Inert non-explosive gases

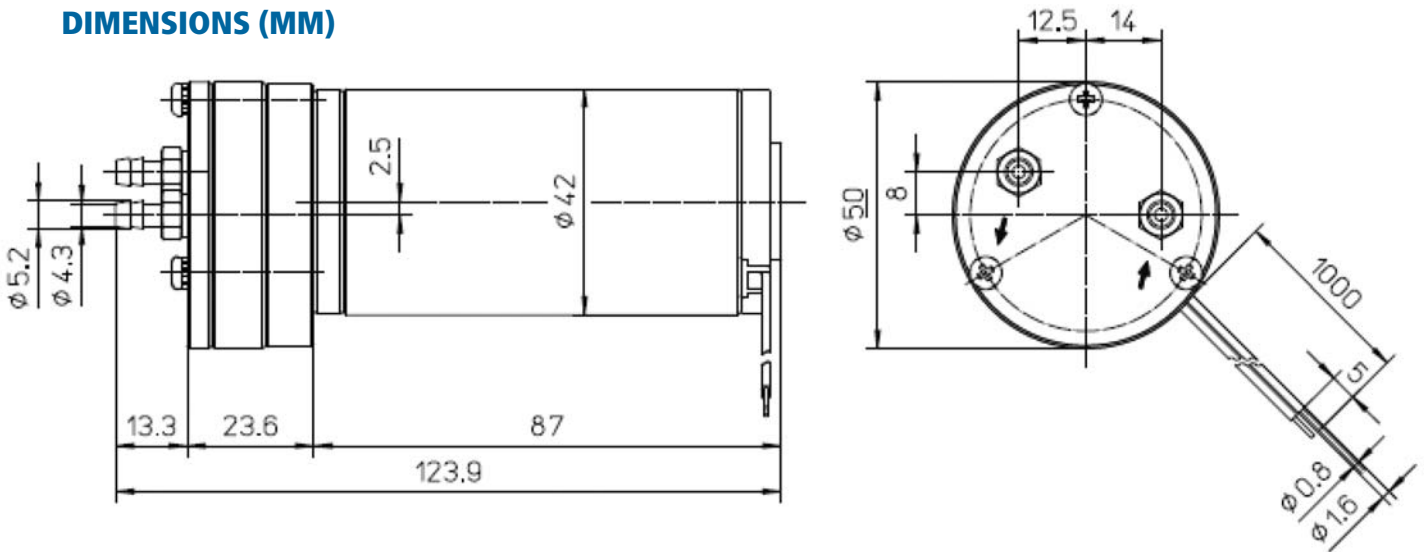
NOTE

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.

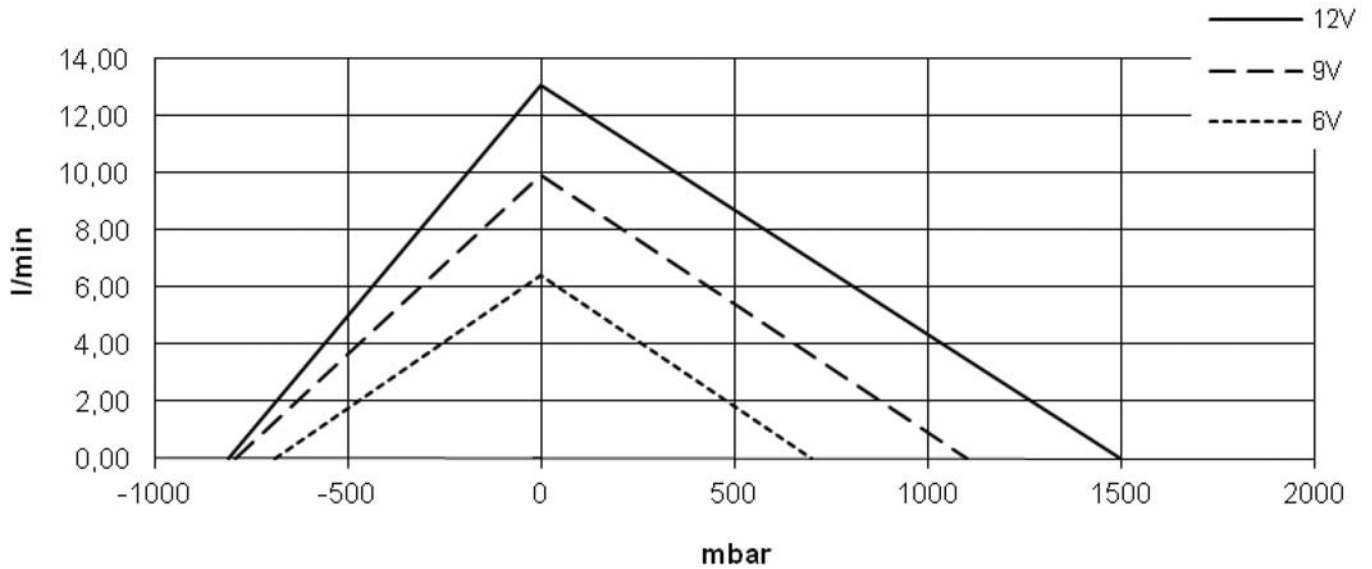
If used for continuous operation, we recommend selection of a pump that has a slightly higher pumping capacity than needed during normal operation.



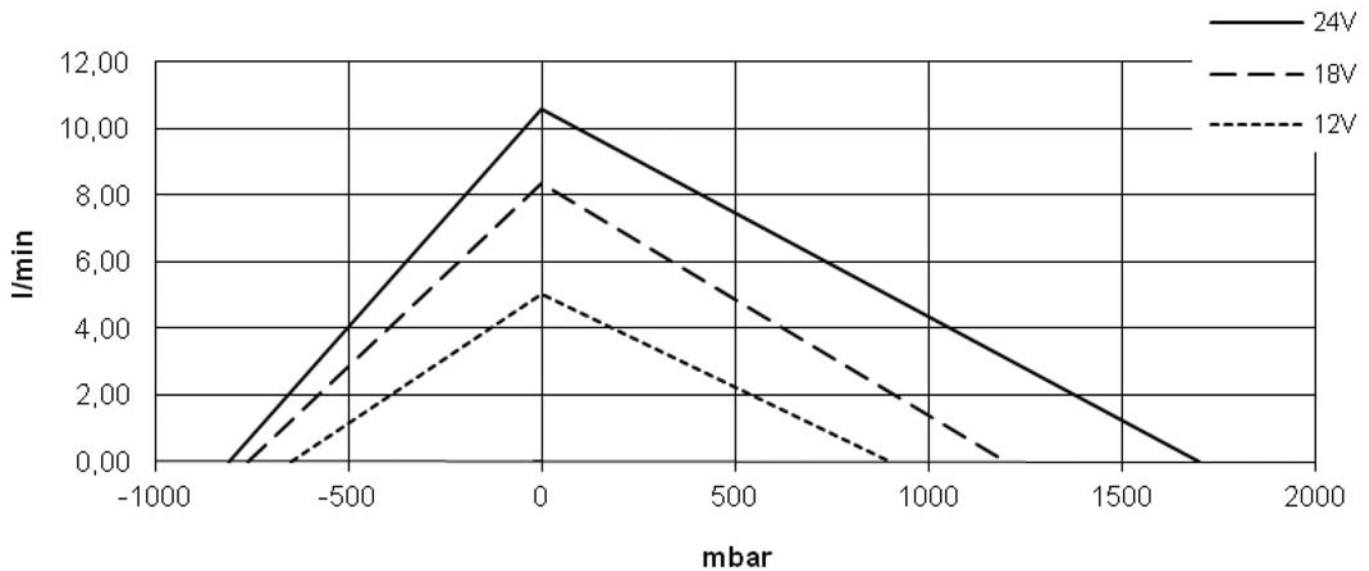
DIMENSIONS (MM)



Type/Model: DC12/90SL



Type/Model: DC24/90SL



ORDERING INFORMATION

Model/ Order Code	Nominal Current (A)	Voltage (V)	Max. Flow (L/min)	Vacuum				Pressure				Weight (kg)
				Current		Vacuum (mbar)	Noise Level (dBA)	Current		Pressure (mbar)	Noise Level (dBA)	
				Min (A)	Max (A)			Min (A)	Max (A)			
DC12/90SL No. 15988	2.7	12.0	13.0	1.6	3.0	810	84	2.2	7.6	1500	71	0.79
		9.0	9.9	1.3	3.1	790	81	1.8	5.4	1100	74	
		6.0	6.3	1.1	2.8	690	73	1.1	3.4	700	69	
DC24/80L No. 16987	1.2	24.0	10.5	0.7	1.2	810	82	0.7	3.2	1700	71	
		18.0	8.3	0.6	1.0	760	79	0.6	2.4	1200	65	
		12.0	5.0	0.4	0.9	650	73	0.5	1.6	900	59	

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

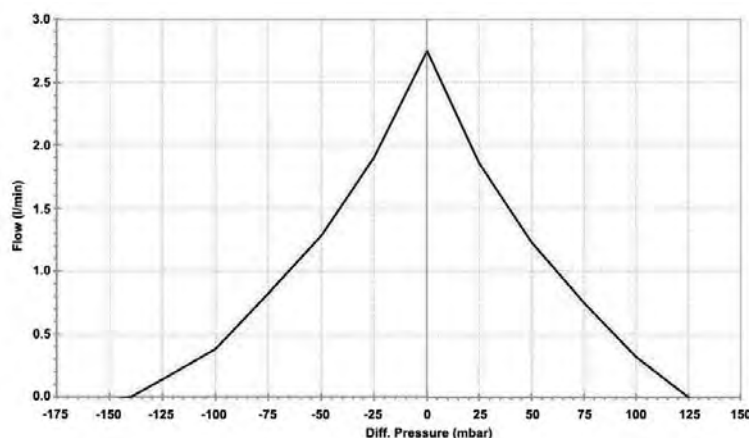
Valves: Silicone

Connection Tubing ID: 3/16"

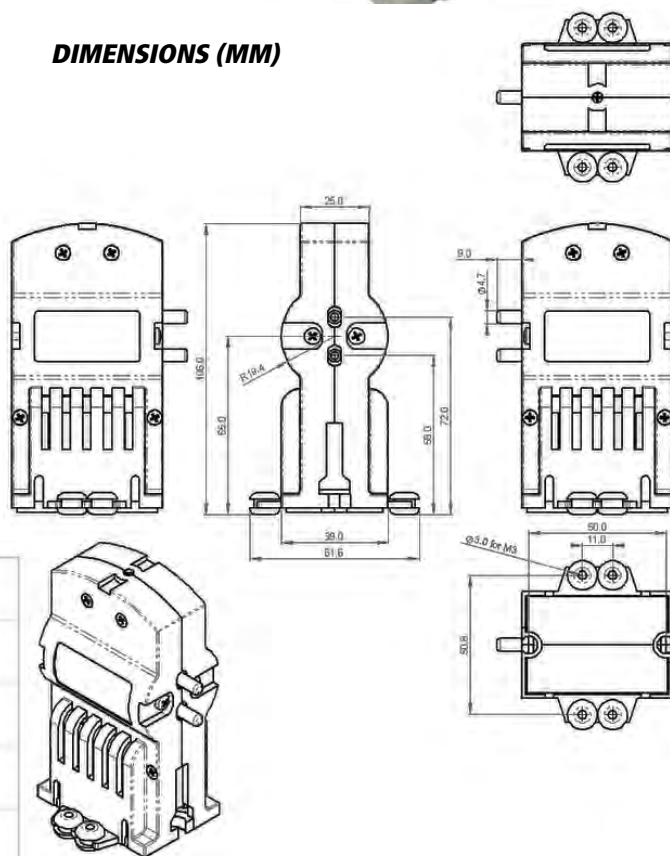
Typical Life Expectancy: In excess of two years
continuous use subject to operating environment

Weight: 245g

FLOW CURVE



DIMENSIONS (MM)



ORDERING INFORMATION

Model	Description
8024.024	24VAC, 50/60Hz
8110.110	110VAC, 50/60Hz
8230.230	230VAC, 50/60Hz