

STANDARD PUMPS & COMPRESSORS



METAL BELLOWS VACUUM
PUMPS AND COMPRESSORS:

STANDARD SOLUTIONS TO
YOUR TOUGHEST PUMPING
APPLICATIONS

senior
**Metal
Bellows**

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FEATURES, DESCRIPTIONS, APPLICATIONS

Standard MB (Metal Bellows) vacuum pumps and compressors are frequently modified to meet unique customer requirements. Customized applications may include all metal construction, ability to withstand extreme operating temperatures, or such special electrical characteristics as explosion proof motors, variable speed motors, DC motors and various voltage requirements. SMB (Senior Metal Bellows) also offers double containment units for radioactive, toxic, and rare gas applications.

Whether they are standard or specially designed for a particular application, MB® pumps share these common features:

- **LONG LIFE** – uniform, symmetrical welds that assure long life
- **STAINLESS STEEL** – all wetted surfaces made from corrosion resistant 300 Series stainless steel except for the valve assembly gaskets which are either Teflon® or Viton® (all metal wetted surfaces available on request)
- **NO MAINTENANCE** – no wearing surfaces and no lubrication required
- **HERMETICALLY SEALED** – hermetically sealed welded bellows that provide positive containment. Every pump is pressure tested to assure leak-tight integrity, with certification to mass spectrometer leak testing available
- **INFINITE NUMBER OF CYCLES** – bellows and valves designed with stress levels below defined endurance limits of materials allowing for an infinite number of cycles

- **SEALED BALL BEARINGS** – motor and drive assembly containing permanently lubricated and sealed ball bearings
- **POSITIVE BELLOWS DISPLACEMENT** – eccentric between the bearings and the motor shaft that provides motion for positive bellows displacement

APPLICATIONS:

- Gas analysis, analytical instrumentation sampling
- Nuclear radiation monitoring
- High voltage electronics cooling and wave guide pressurization
- High temperature engine exhaust analysis
- Ambient air sampling

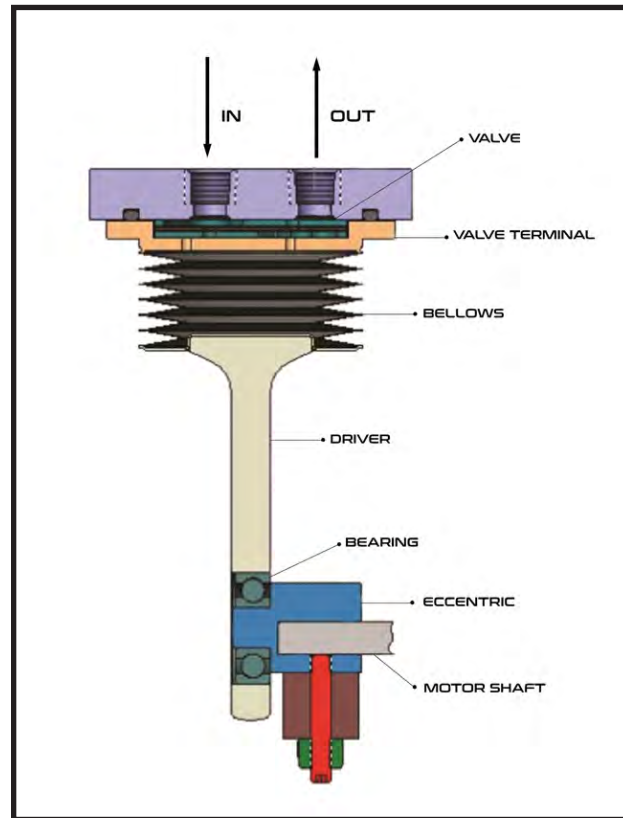
- Radioactive, toxic, costly gas processing
- Research and laboratory experiments providing contaminant free samples
- Commercial aircraft potable water pressurization system
- Semiconductor process gas handling

NOTE:

Performance curves in this catalog are based on:

- Atmospheric pressure at the inlet for pressure curves and
- Atmospheric pressure at the discharge for vacuum curves.

For other conditions see Page 24



MB
CONCEPT

VACUUM PUMPS AND COMPRESSORS

MB-21, MB-21 3W, MB-21E

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	6 lbs (7.2 lbs for MB-21E)
Port Connections	1/8" NPT

ELECTRICAL

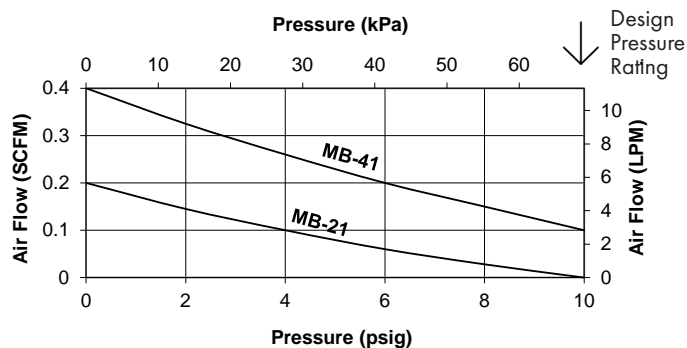
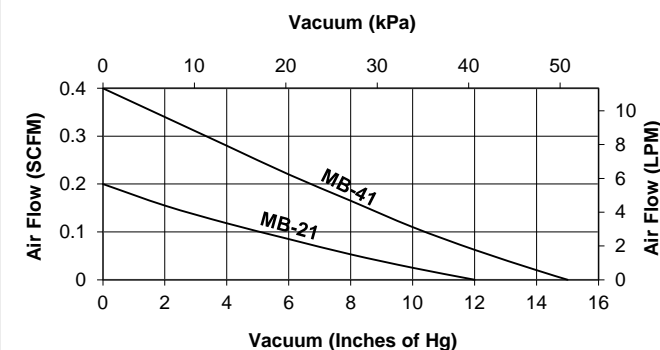
Standard	115V (220V/240V for MB-21E) 50/60Hz
Current at 115V/60 Hz	2.3 Amps (max)
Motor Specification	1/40 HP Shaded Pole induction motor with ball bearings and thermal overload protection (Permanent Capacitor Induction Type for MB-21E)

OPTIONAL FEATURES:

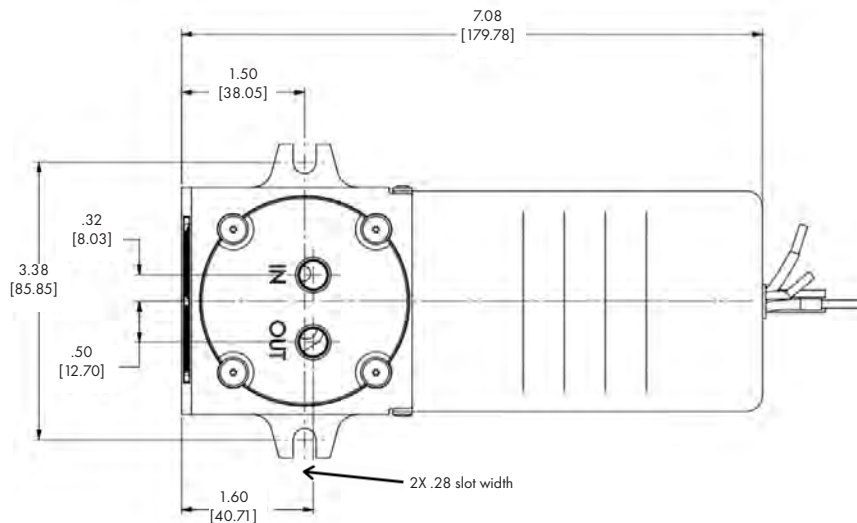
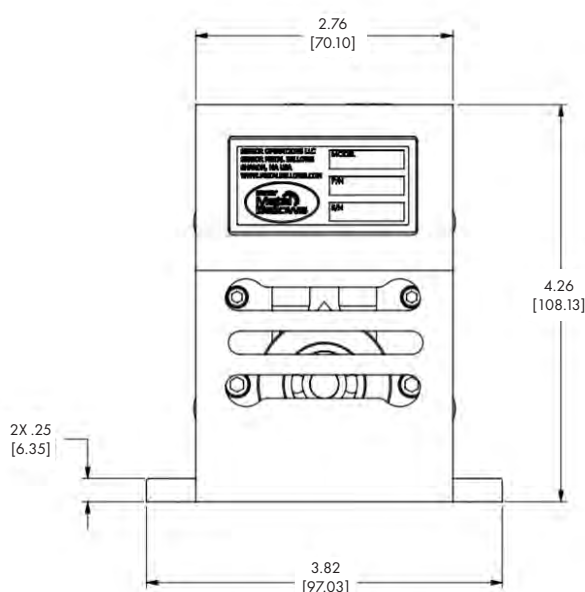
240V 50 Hz DC Motors, Viton® Valve Gaskets, VCR Fittings, 8 Foot, 3 Conductor Cord (3W)

Operating Speed @ 60 Hz 2500 RPM (3400 RPM for MB-21E)

Insulation Class B (Class F for MB-21E)



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows. Curves plotted at 2500 RPM.



Dimensions for the Model "E" pump will vary slightly from the above. Consult Factory.

MB-41, MB-41 3W, MB-41E

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	6 lbs (7.2 lbs for MB-41E)
Port Connections	1/8" NPT

ELECTRICAL

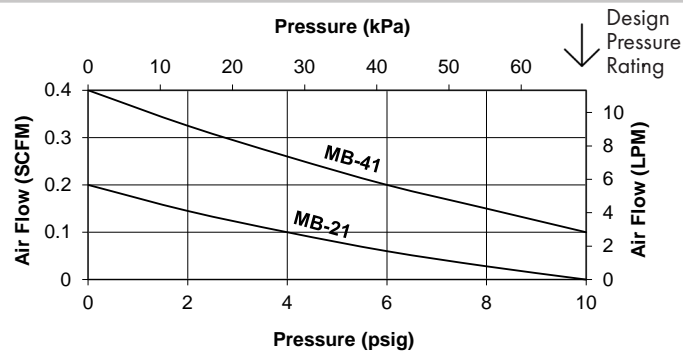
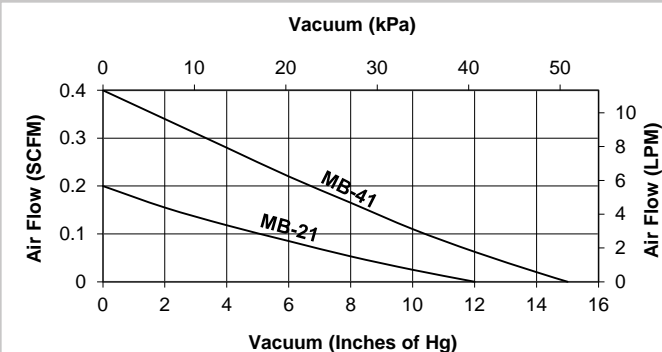
Standard	115V (220V/240V for MB-41E) 50/60Hz
Current at 115V/60 Hz	2.3 Amps (max)
Motor Specification	1/40 HP Shaded Pole induction motor with ball bearings and thermal overload protection (Permanent Capacitor Induction Type for MB-41E)

OPTIONAL FEATURES:

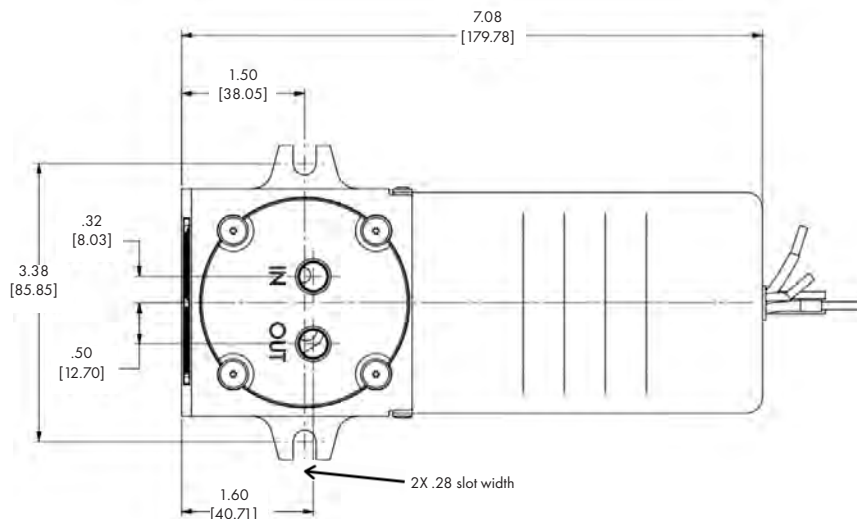
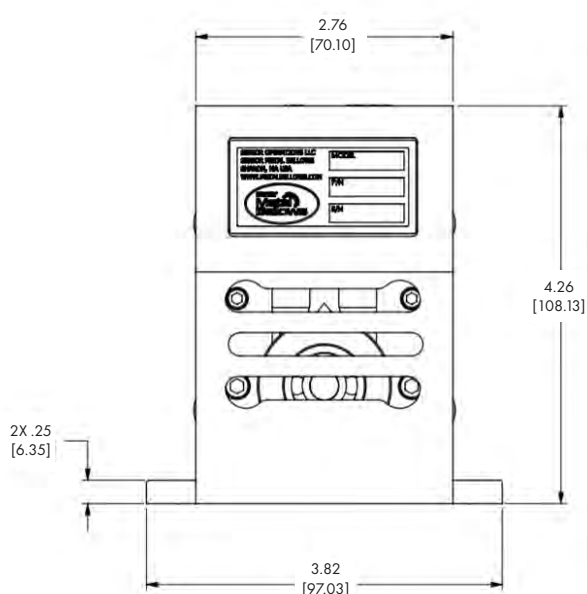
240V 50 Hz DC Motors, Viton® Valve Gaskets, VCR Fittings, 8 Foot, 3 Conductor Cord(3W)

Operating Speed @ 60 Hz 2500 RPM (3400 RPM for MB-41E)

Insulation Class B (Class F for MB-41E)



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows. Curves plotted at 2500 RPM.



Dimensions for the Model "E" pump will vary slightly from the above. Consult Factory.

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	24 lbs
Port Connections	1/4" NPT

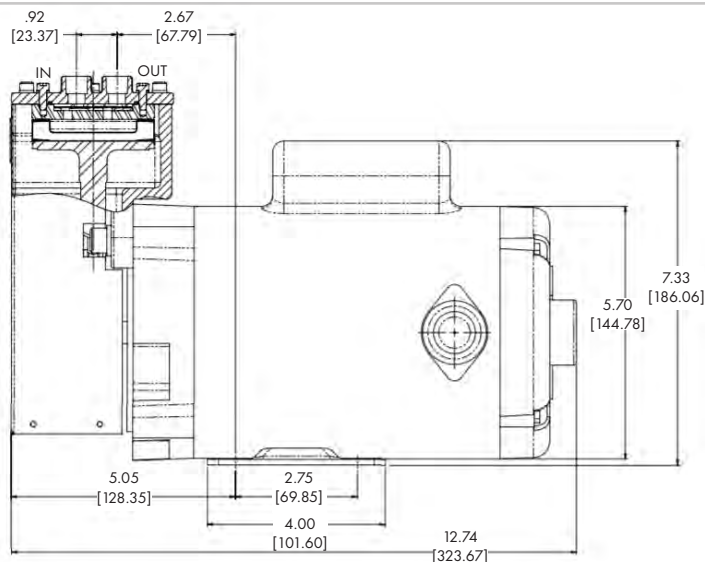
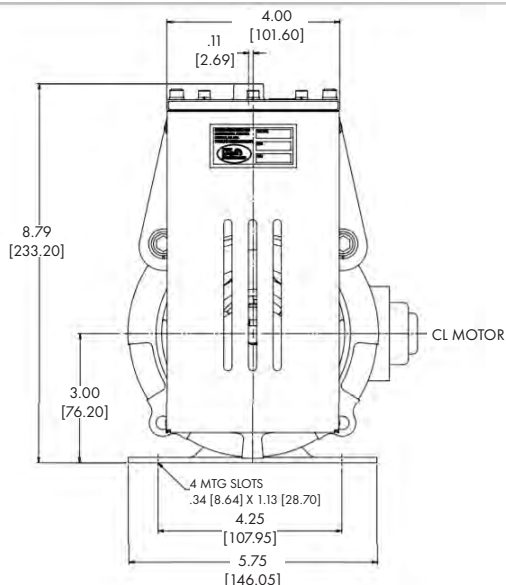
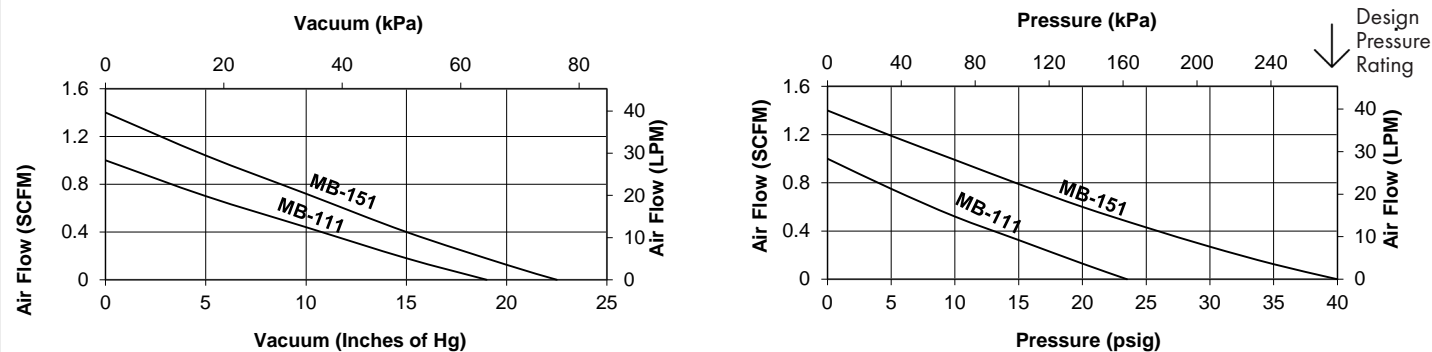
ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	5.4 Amps (max)
Motor Specification	1/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



OPTIONAL FEATURES:

Explosion Proof Motor, Totally Enclosed Fan Cooled (TEFC) Motor, Variable Speed Motor, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings, High Pressure Models (see page 23)



MB-111 XP



OPTIONAL FEATURES:

Totally Enclosed Fan Cooled (TEFC) Motor, Variable Speed Motor, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings, High Pressure Models (see page 23)

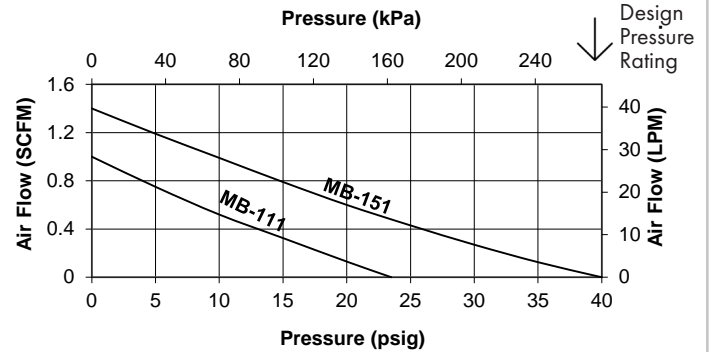
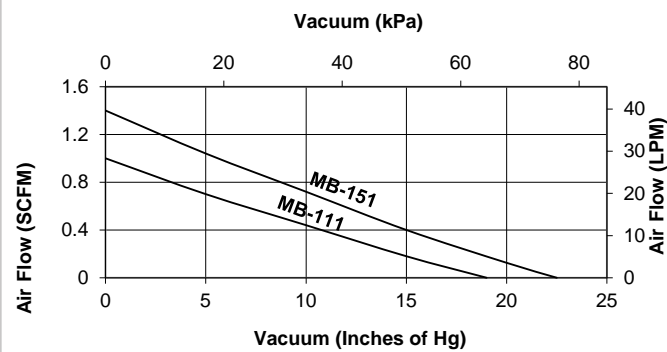
SPECIFICATIONS

GENERAL

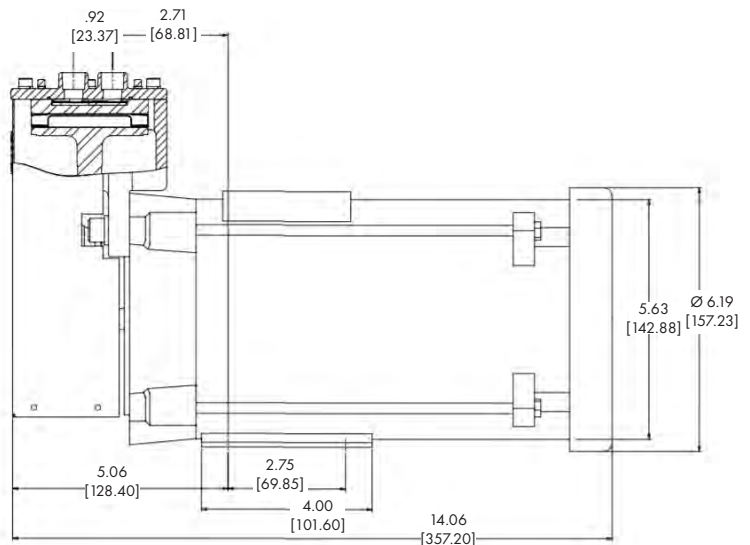
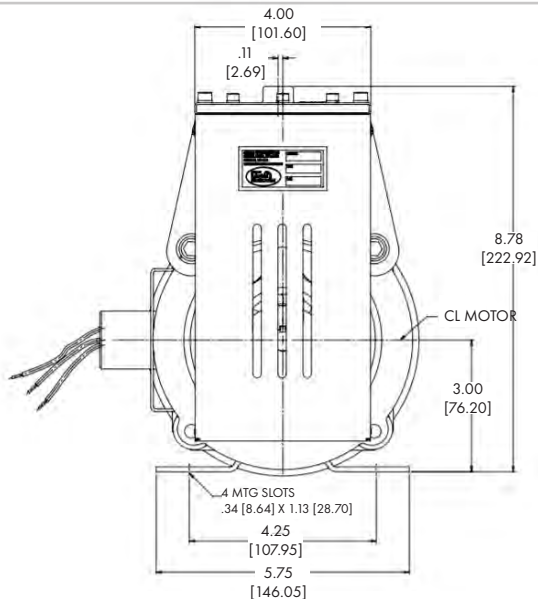
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	24 lbs
Port Connections	1/4" NPT

ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	4.2 Amps (max)
Motor Specification	1/4 HP Single Phase XPFC
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



MB-118 MB-118E

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets
Bearings	Permanently lubricated ball type
Weight	14 lbs
Port Connections	1/4" NPT

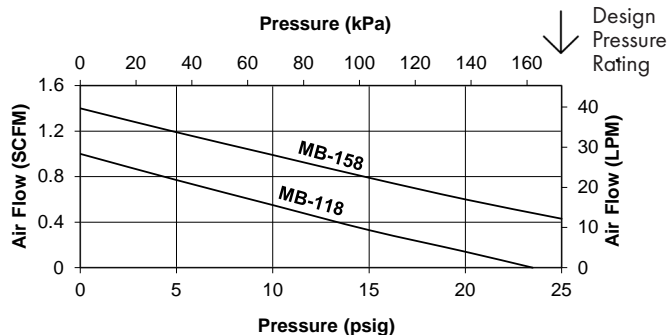
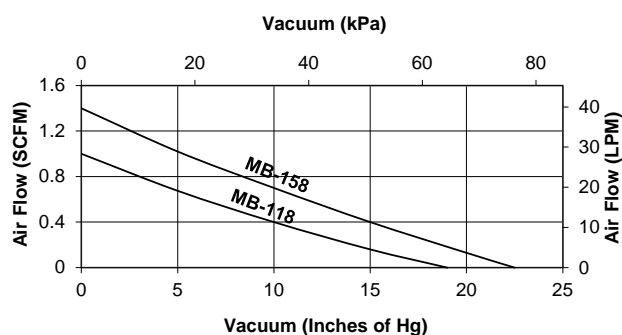
ELECTRICAL

Standard	115V 50/60Hz (230V 50Hz for MB-118E)
Current at 115V/60 Hz	1.4 Amps (max) (0.9 Amps for MB-118E)
Motor Specification	1/10 HP
Operating Speed @ 60 Hz	1700 RPM (1700 RPM for MB-118E)

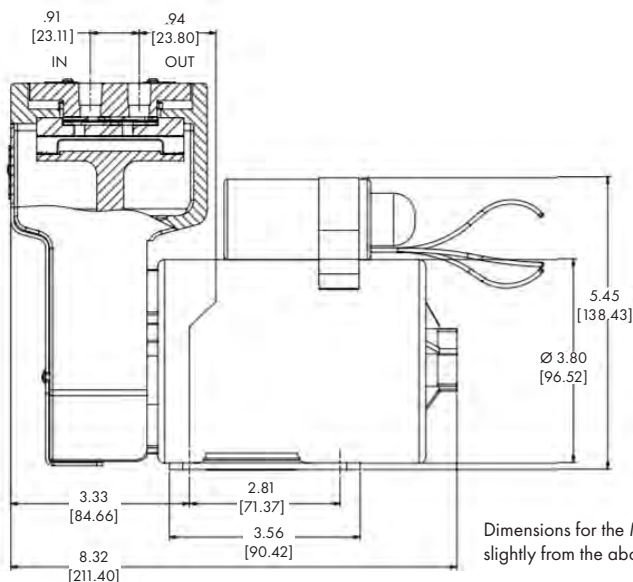
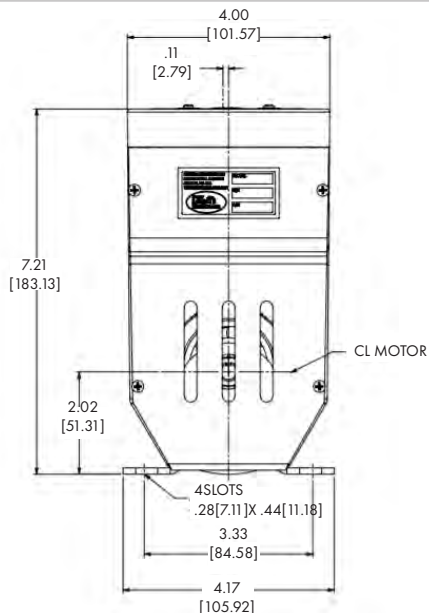
Insulation Class B

OPTIONAL FEATURES:

230V 50 Hz DC Motors, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Dimensions for the Model "E" pump will vary slightly from the above. Consult Factory.

MB-118HT

SPECIFICATIONS

GENERAL

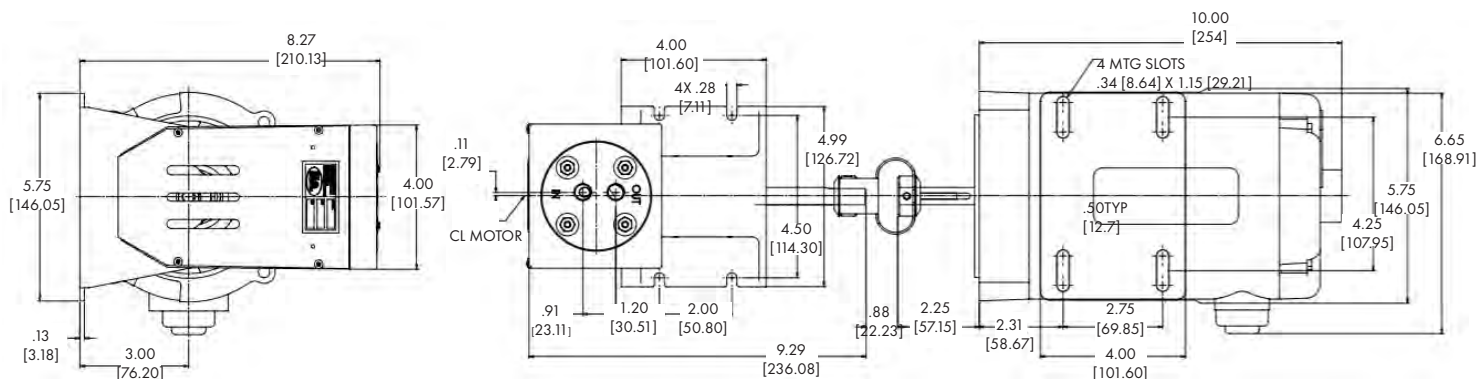
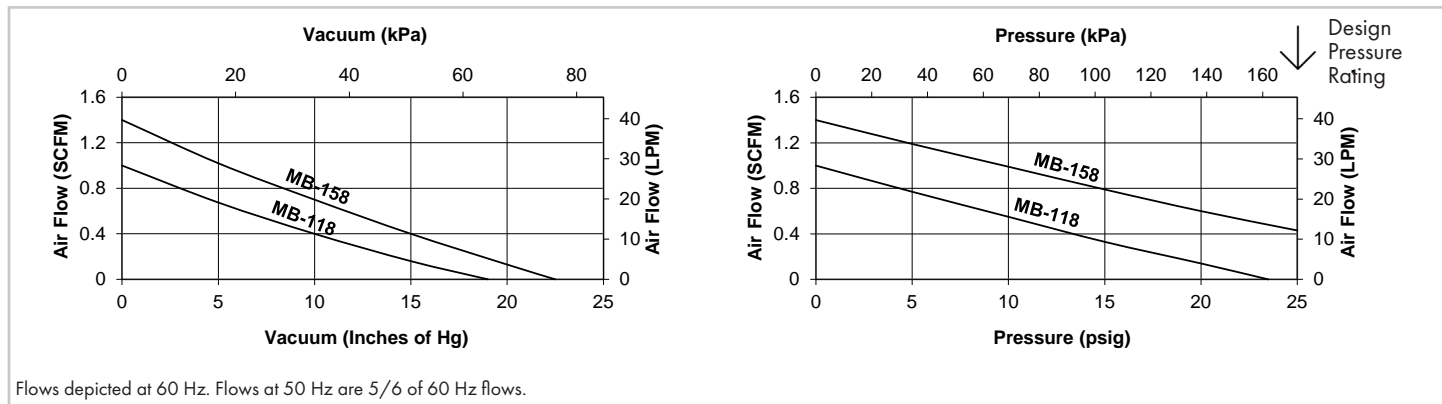
Housing Body	Nickel plated cast iron and aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets
Bearings	Permanently lubricated and shielded, heat stabilized ball type
Weight	26 lbs
Process temp	392 °F max for pump head / 105 °F max for motor
Port Connections	1/4" NPT

ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	5.4 Amps (max)
Motor Specification	1/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1700 RPM
Insulation	Class B

OPTIONAL FEATURES:

Explosion Proof Motor, Totally Enclosed Fan Cooled (TEFC) Motor, Shaft Lengths to 8"



Motor mounting plates are shown for dimensional purposes only. Actual motor mounting plates are located on the underside of the motor.

MB-151

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	24 lbs
Port Connections	1/4" NPT

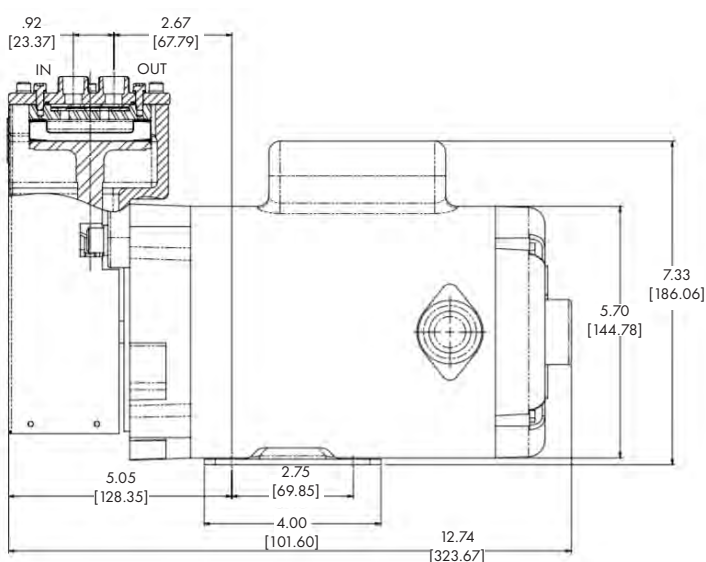
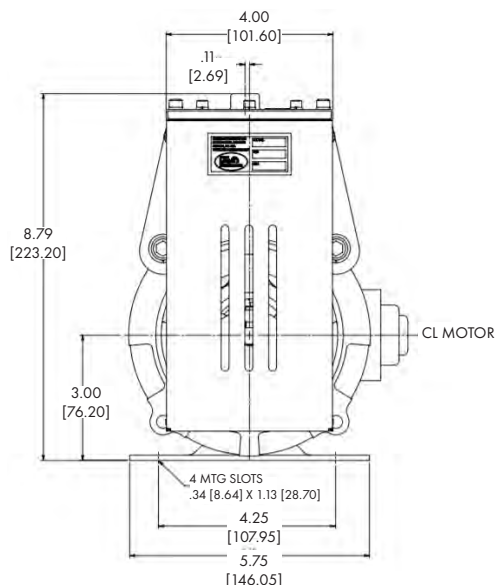
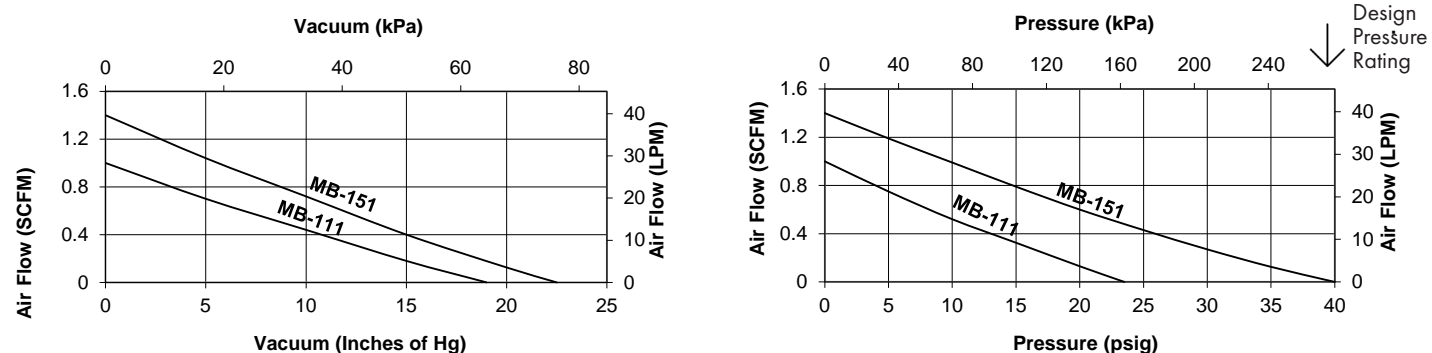
ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	5.4 Amps (max)
Motor Specification	1/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



OPTIONAL FEATURES:

Explosion Proof Motor, Totally Enclosed Fan Cooled (TEFC) Motor, Variable Speed Motor, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings, High Pressure Models (see page 23)



MB-151 XP



OPTIONAL FEATURES:

Totally Enclosed Fan Cooled (TEFC) Motor, Variable Speed Motor, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings, High Pressure Models (see page 23)

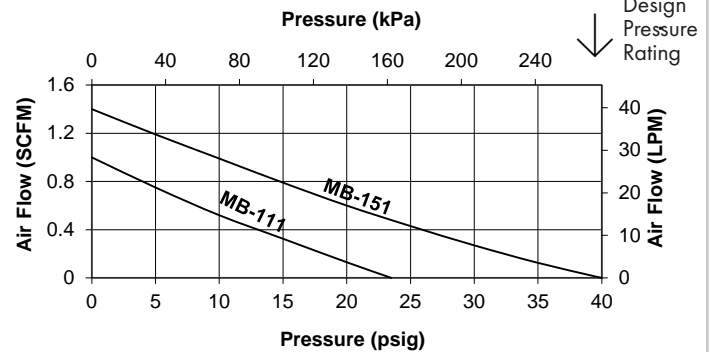
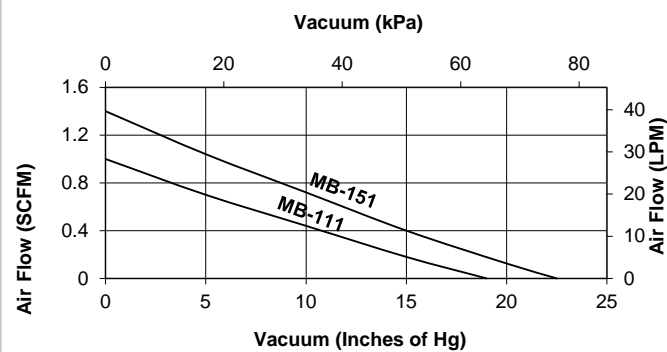
SPECIFICATIONS

GENERAL

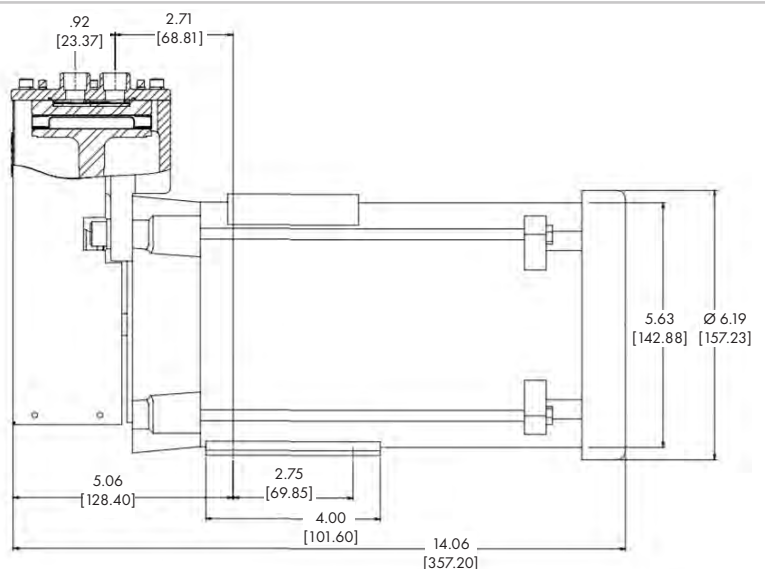
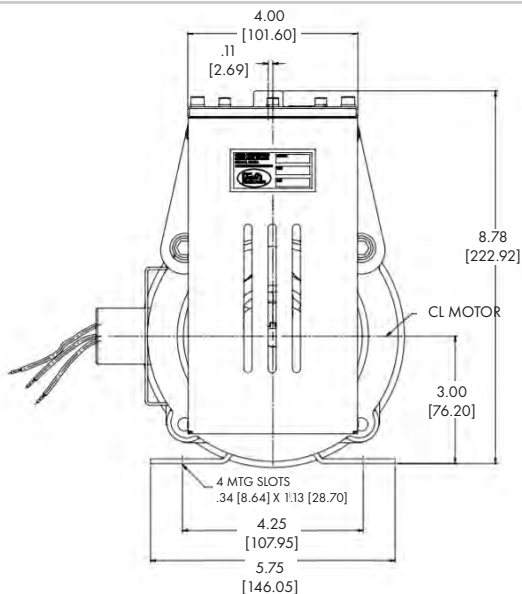
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Viton® Valve Gaskets and O-Rings
Bearings	Permanently lubricated ball type
Weight	24 lbs
Port Connections	1/4" NPT

ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	4.2 Amps (max)
Motor Specification	1/4 HP Single Phase XPFC
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



MB-158, MB-158E



OPTIONAL FEATURES:

230V 50 Hz DC Motors, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings

SPECIFICATIONS

GENERAL

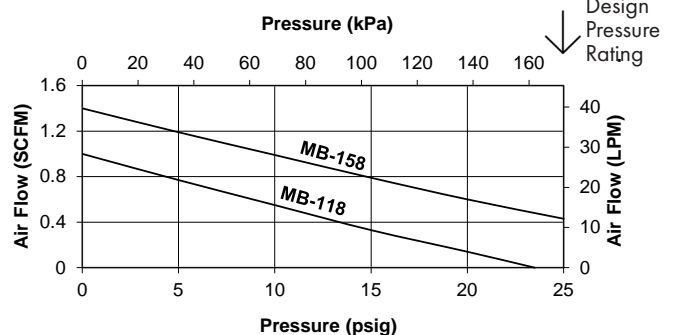
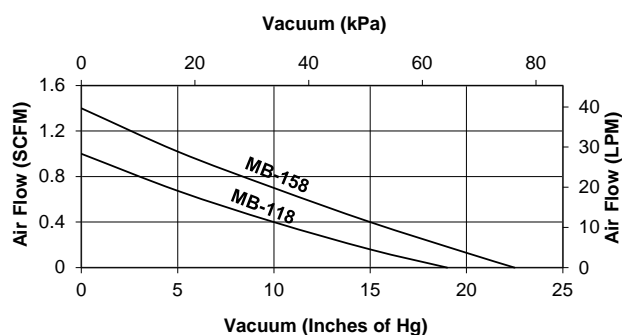
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets
Bearings	Permanently lubricated ball type
Weight	14 lbs
Port Connections	1/4" NPT

ELECTRICAL

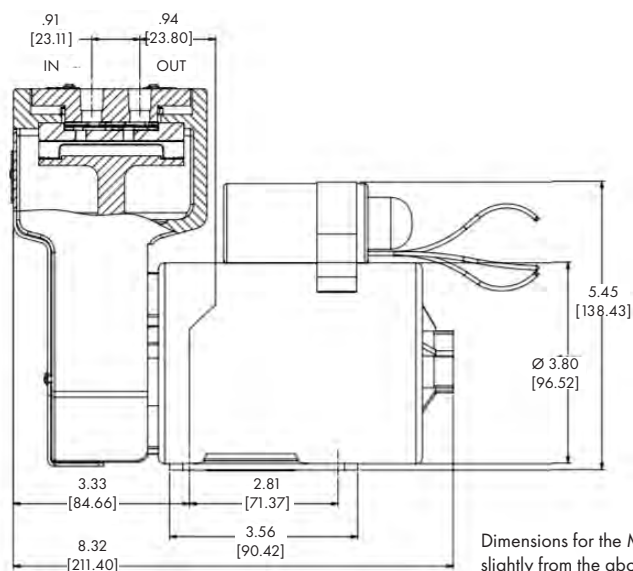
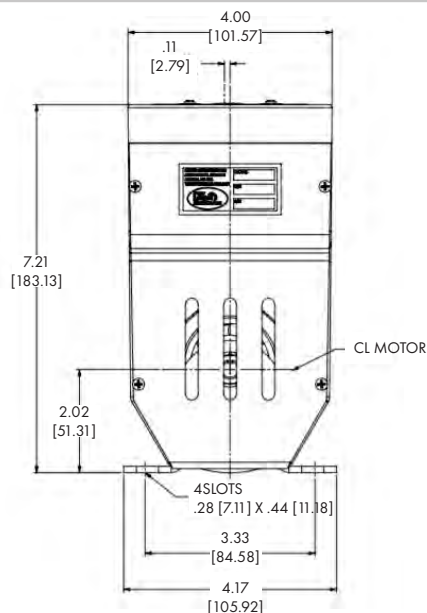
Standard	115V 50/60Hz (230V 50Hz for MB-158E)
Current at 115V/60 Hz	1.4 Amps (max) (0.9 Amps for MB-158E)
Motor Specification	1/10 HP
Operating Speed @ 60 Hz	1700 RPM (1700 RPM for MB-158E)

Insulation

Class B



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Dimensions for the Model "E" pump will vary slightly from the above. Consult Factory.

MB-158HT



OPTIONAL FEATURES:

Explosion Proof Motor, Totally Enclosed Fan Cooled (TEFC) Motor, Shaft Lengths to 8"

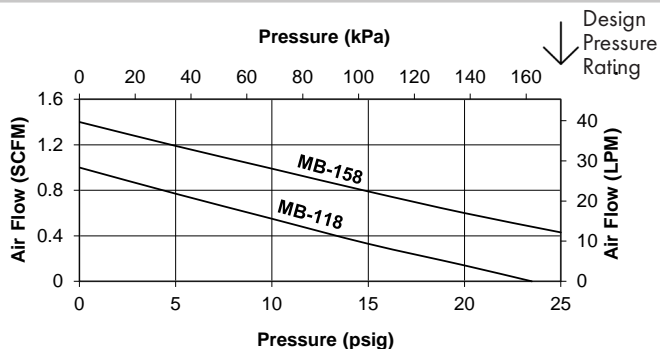
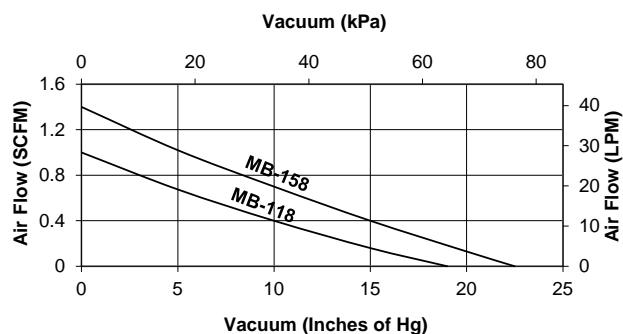
SPECIFICATIONS

GENERAL

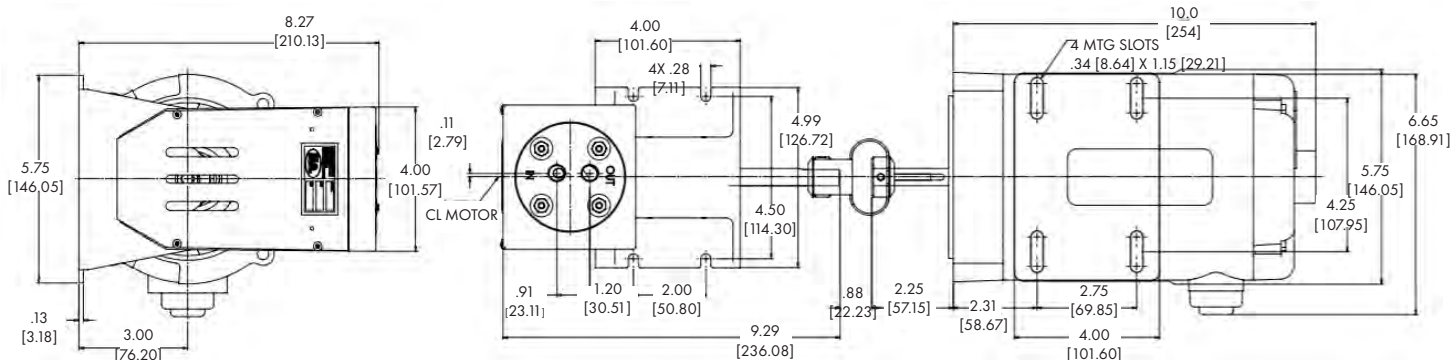
Housing Body	Nickel plated cast iron and aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets
Bearings	Permanently lubricated and shielded, heat stabilized ball type
Weight	26 lbs
Process temp	392 °F max for pump head / 105 °F max for motor
Port Connections	1/4" NPT

ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	5.4 Amps (max)
Motor Specification	1/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Motor mounting plates are shown for dimensional purposes only. Actual motor mounting plates are located on the underside of the motor.

MB-302

SPECIFICATIONS

GENERAL

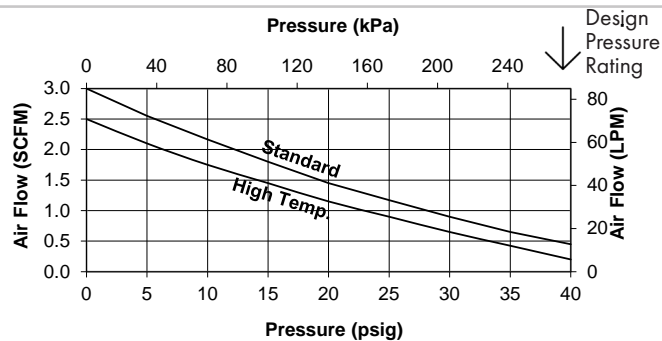
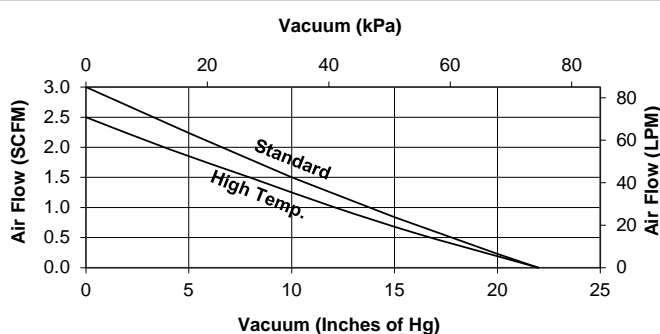
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	26 lbs
Port Connections	3/8" NPT

ELECTRICAL

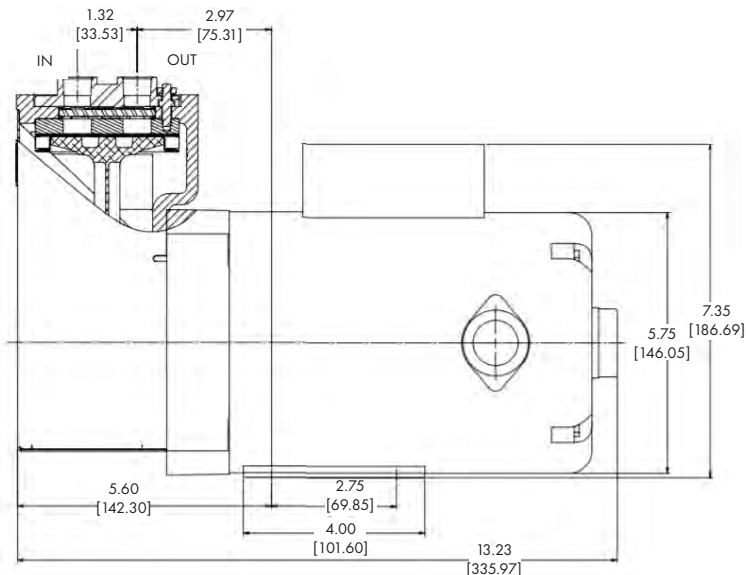
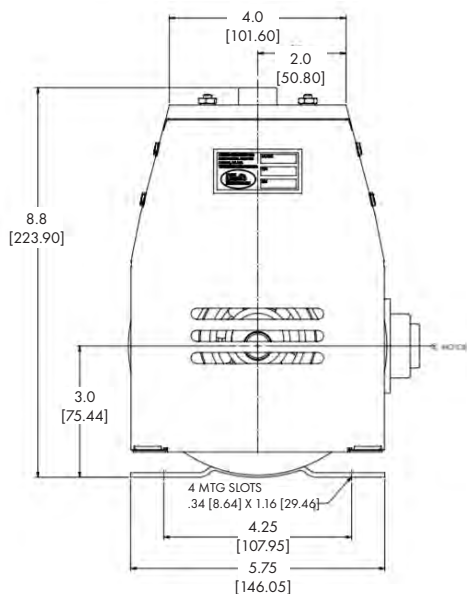
Standard	115/230V 50/60Hz
Current at 115V/60 Hz	6.8 Amps (max)
Motor Specification	1/2 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	3450 RPM
Insulation	Class B

OPTIONAL FEATURES:

Explosion Proof Motor, Polyphase Motor; Totally Enclosed Fan Cooled (TEFC) Motor, Viton® Valve Gaskets, VCR Fittings



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



MB-302HT

SPECIFICATIONS

GENERAL

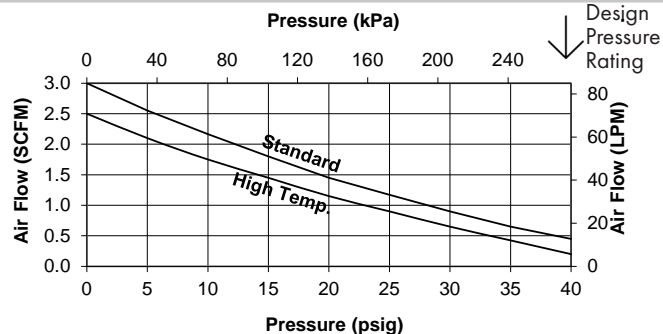
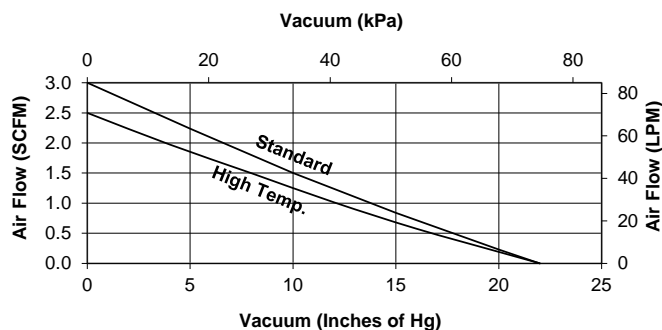
Housing Body	Nickel plated cast iron and aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated and shielded, heat stabilized ball type
Weight	37 lbs
Process temp	392 °F max for pump head / 105 °F max for motor
Port Connections	3/8" NPT

ELECTRICAL

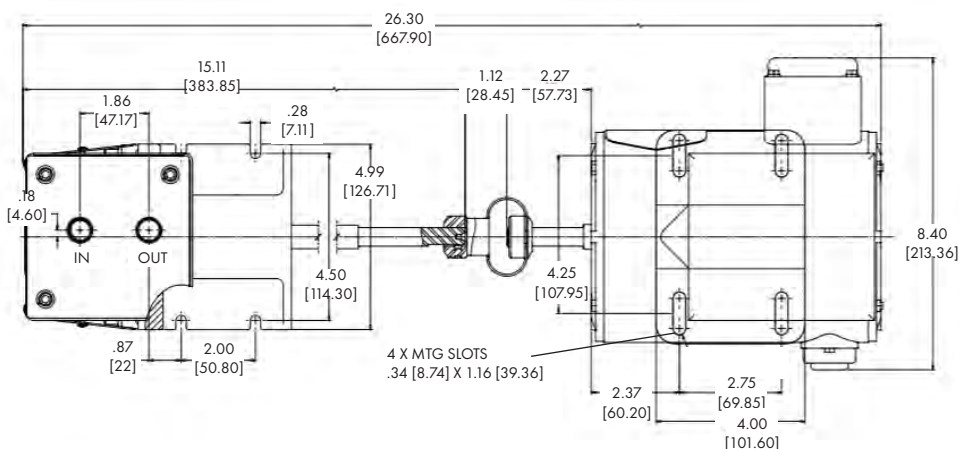
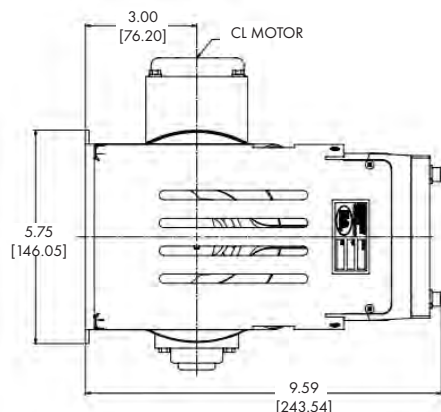
Standard	115/230V 50/60Hz
Current at 115V/60 Hz	7.4 Amps (max)
Motor Specification	1/2 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B

OPTIONAL FEATURES:

Explosion Proof Motor, Polyphase Motor; Totally Enclosed Fan Cooled (TEFC) Motor



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Motor mounting plates are shown for dimensional purposes only. Actual motor mounting plates are located on the underside of the motor.

MB - 601



OPTIONAL FEATURES:

Explosion Proof Motor, Polyphase Motor, Totally Enclosed Fan Cooled (TEFC) Motor, Variable Speed Motor, Viton® Valve Gaskets, Aluminum O-Ring Seals, VCR Fittings, High Pressure Models (see page 23)

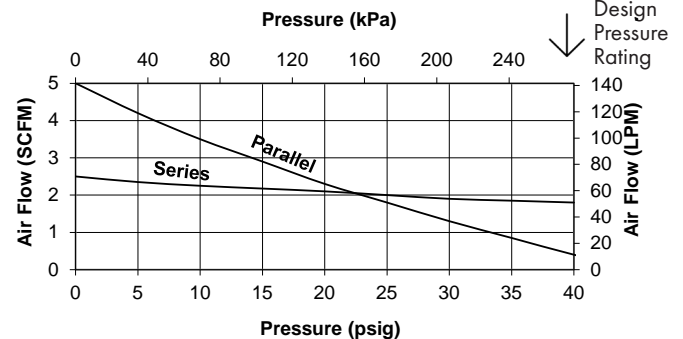
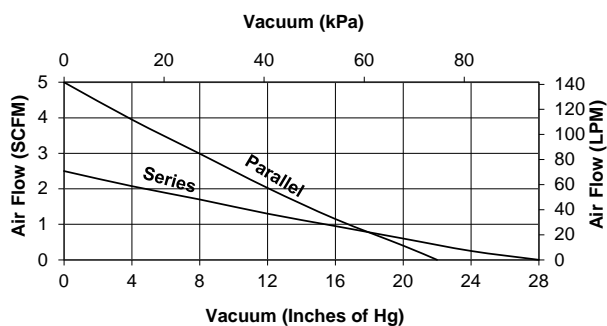
SPECIFICATIONS

GENERAL

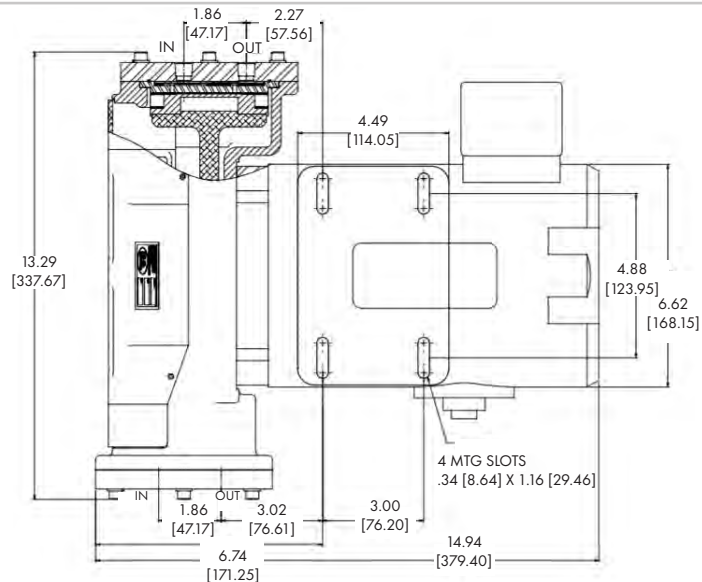
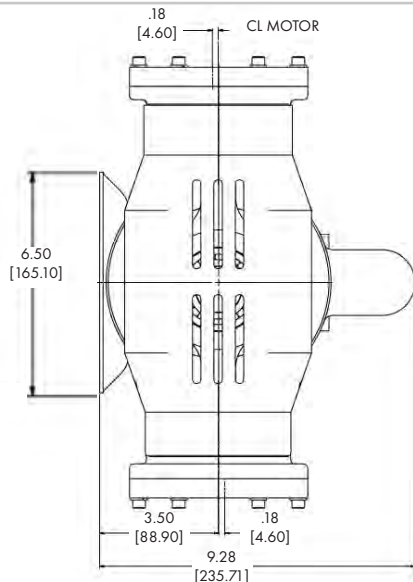
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	48 lbs
Port Connections	3/8" NPT

ELECTRICAL

Standard	115/230V 50/60Hz
Current at 115V/60 Hz	11 Amps (max)
Motor Specification	3/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



MB-601HT

SPECIFICATIONS

GENERAL

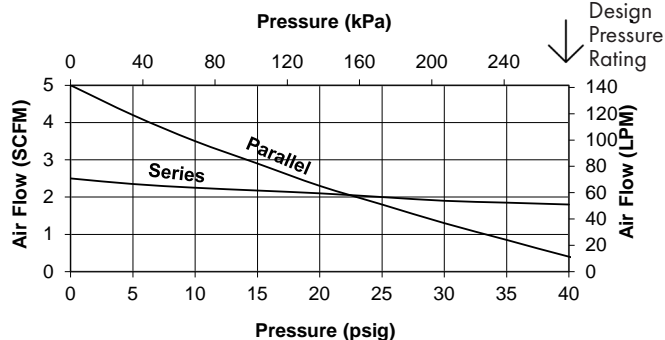
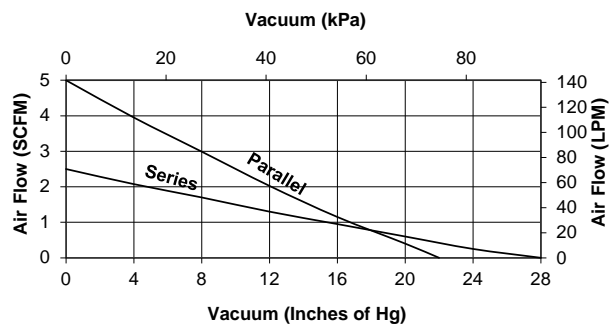
Housing Body	Nickel plated cast iron and aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated and shielded, heat stabilized ball type
Weight	61 lbs
Process temp	392 °F max for pump head / 105 °F max for motor
Port Connections	3/8" NPT

ELECTRICAL

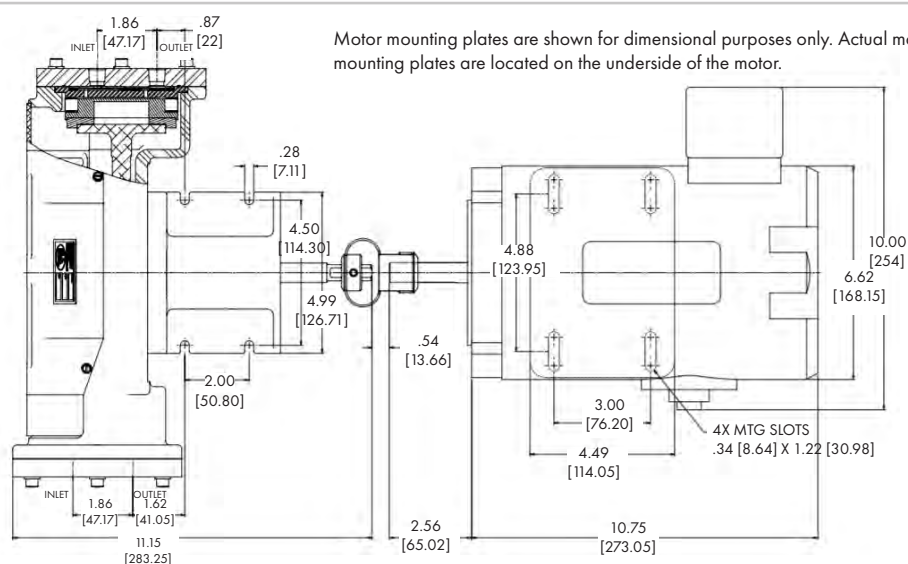
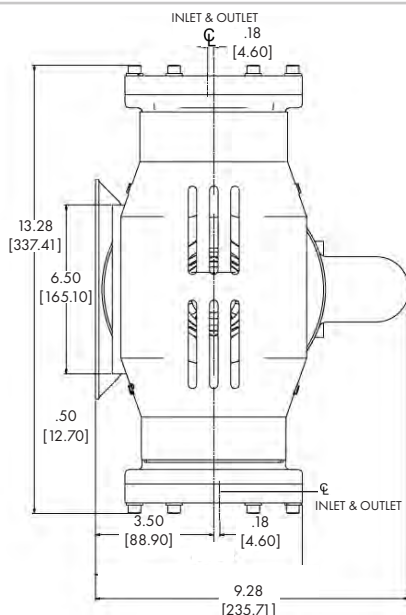
Standard	115/230V 50/60Hz
Current at 115V/60 Hz	11 Amps (max)
Motor Specification	3/4 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B

OPTIONAL FEATURES:

Explosion Proof Motor, Polyphase Motor, Totally Enclosed Fan Cooled (TEFC) Motor



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Motor mounting plates are shown for dimensional purposes only. Actual motor mounting plates are located on the underside of the motor.

MB - 602

SPECIFICATIONS

GENERAL

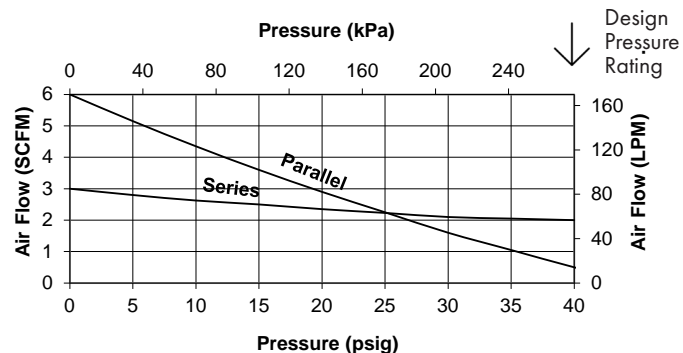
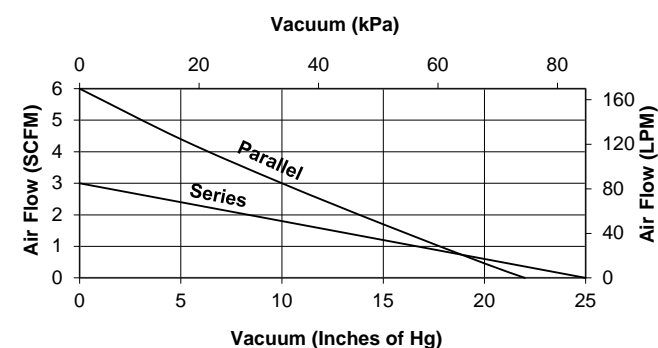
Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	30 lbs
Port Connections	3/8" NPT

ELECTRICAL

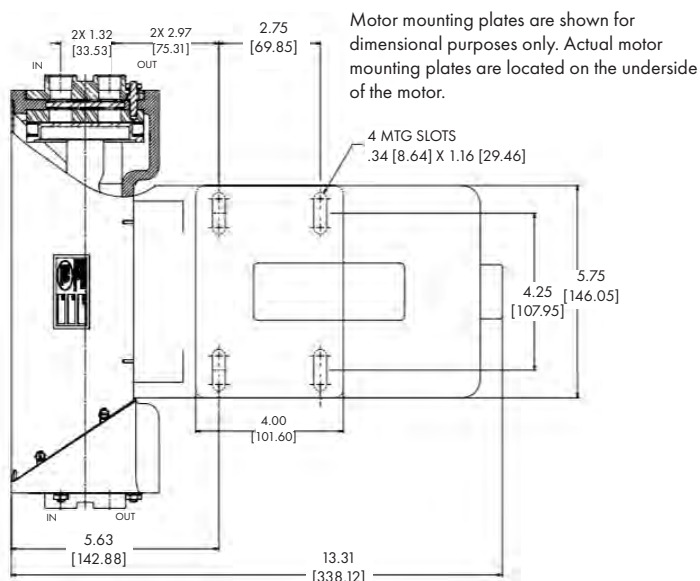
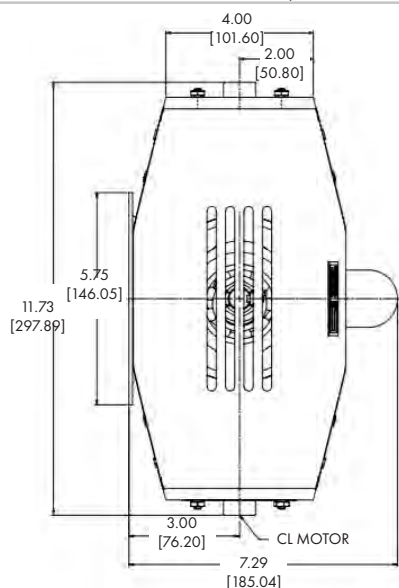
Standard	115/230V 50/60Hz
Current at 115V/60 Hz	6.6 Amps (max)
Motor Specification	1/2 HP Single Phase ODP - Open Drip Proof Motor
Operating Speed @ 60 Hz	3450 RPM
Insulation	Class B

OPTIONAL FEATURES:

Explosion Proof Motor, Polyphase Motor; Totally Enclosed Fan Cooled (TEFC) Motor, Viton® Valve Gaskets, VCR Fittings



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



MB-602 XP

SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Viton® O-Rings
Bearings	Permanently lubricated ball type
Weight	30 lbs
Port Connections	3/8" NPT

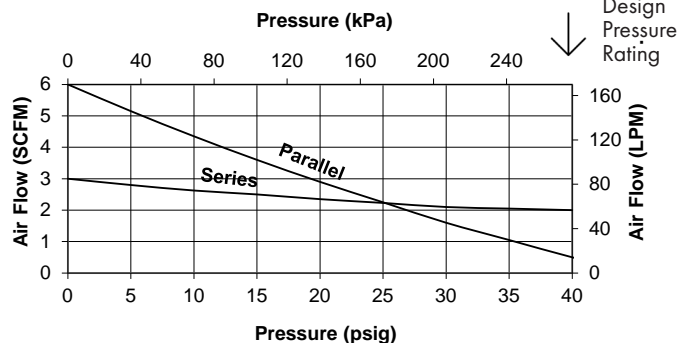
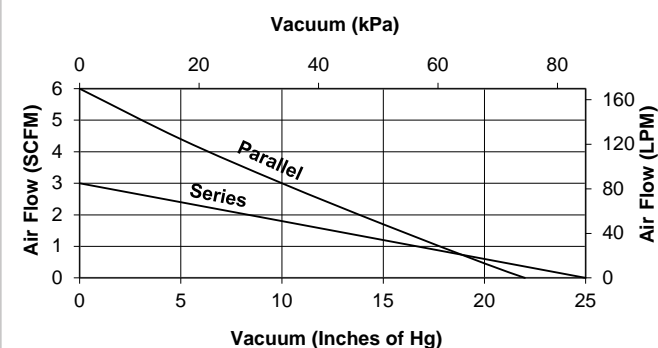
ELECTRICAL

Standard	115/230V 60Hz
Current at 115V/60 Hz	9.4 Amps (max)
Motor Specification	1/2 HP Single Phase XPFC
Operating Speed @ 60 Hz	3450 RPM

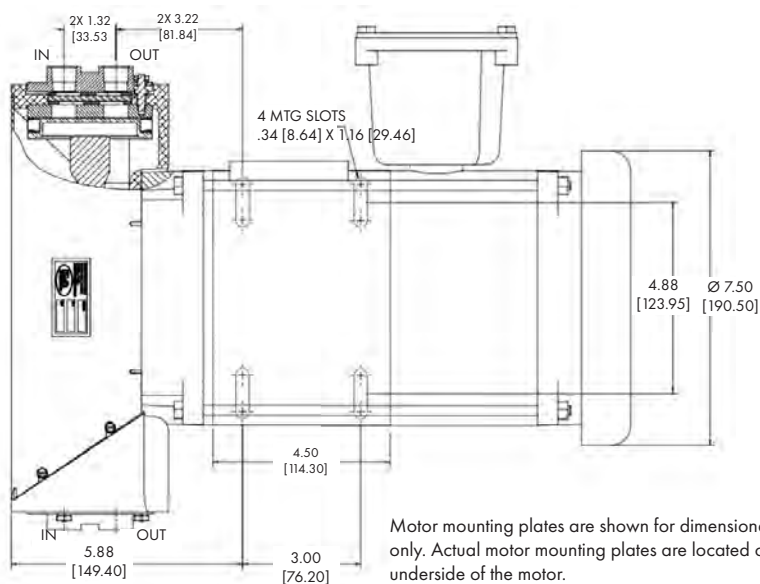
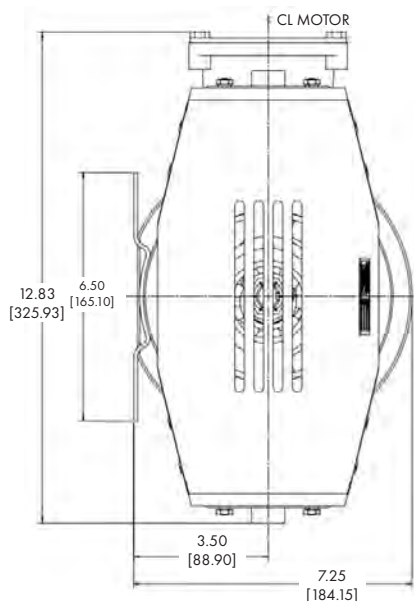
Insulation	Class B
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OPTIONAL FEATURES:

Polyphase Motor; Totally Enclosed Fan Cooled (TEFC) Motor, Viton® Valve Gaskets, VCR Fittings



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



Motor mounting plates are shown for dimensional purposes only. Actual motor mounting plates are located on the underside of the motor.

MODEL PWSC 28823-7

SPECIFICATIONS

GENERAL

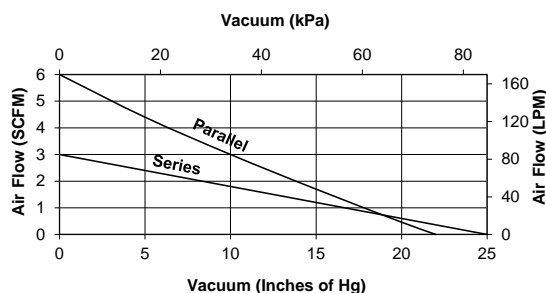
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel except for Valve Assembly; Teflon® Valve Gaskets; Silicone O-Rings
Pump Housing, Cap, and Connecting Rods	Cast Aluminum
Bearings	Permanently lubricated ball type
Port Connections	MS33649 with series connected manifold
Overhaul & Maintenance Manual	Available to ATA 100 specifications
Weight	12 lbs

ELECTRICAL

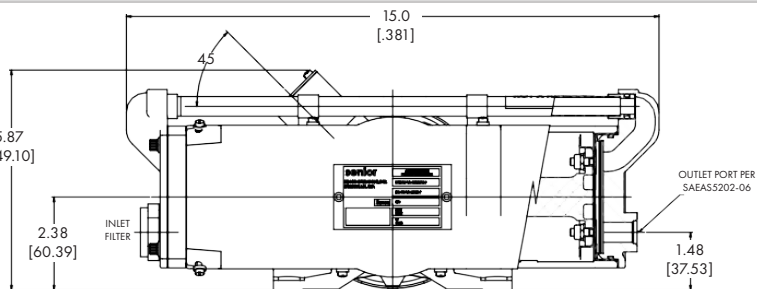
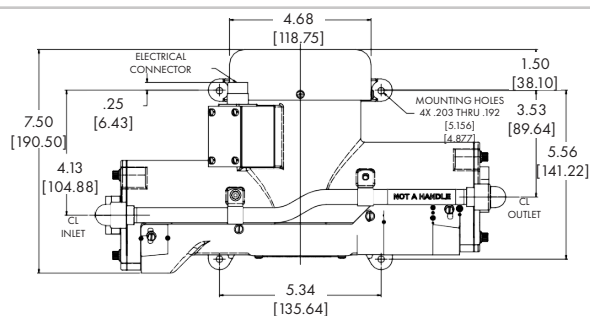
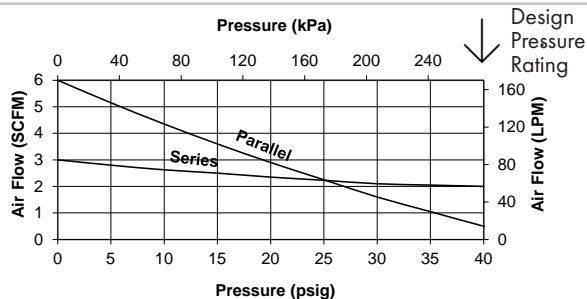
Power	115/200V 400 Hz, 3 Phase, 600 Watts maximum power consumption
Motor Specification	Design in conformance with MIL-M-7969 and is self-cooling with direct acting automatic reset thermal protector
Operating Speed @ 400 Hz	3600 RPM

OPTIONAL FEATURES:

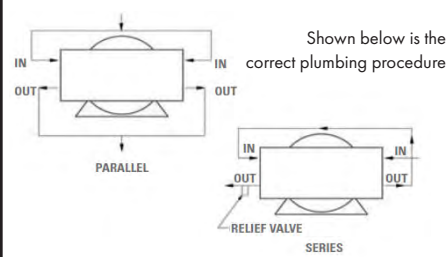
Custom Electrical Connectors, Custom Manifolds



Flows depicted at 60 Hz. Flows at 50 Hz are 5/6 of 60 Hz flows.



DUPLEX PUMPS OPERATED IN SERIES / PARALLEL



DUPLEX PUMPS OPERATED IN SERIES / PARALLEL PLUMBING A MB® DUPLEX VACUUM PUMP COMPRESSOR IN SERIES

Any MB Duplex Vacuum Pump/Compressor can be connected in series and operated as a two-stage pump. This results in a lower absolute inlet pressure when operated as a vacuum pump and a higher flow at maximum rated pressure when operated as a compressor (see flow curves). To do this, connect the outlet port of the first stage to the inlet port of the second stage with a manifold. For compressor operation, connect service line to the outlet port of the second stage. For vacuum operation, connect the service line to the inlet port of the first stage.

Caution: Never operate with the outlet port of the second stage fully closed. This will cause extremely high pressure build up in the second stage that can damage the pump. It is recommended that a relief valve set at 40 PSIG be used in the outlet line to prevent this over pressurization.

STANDARD PARTS

STANDARD MODELS ADAPTATIONS OF STANDARD CUSTOM DESIGNS

Whatever your application requires, SMB stands ready to help you find a solution. Our Sales and Engineering Personnel will help you select a standard pump, resolve a modification to a standard or define a custom design to meet your needs. Custom designs are available for system pressures below 50 torr and high pressure models to 100 psi.

CALL SENIOR METAL BELLOWS FOR ASSISTANCE

Sales personnel will assist you in resolving your needs. If your application requires a special system, we will put you directly in touch with the proper technical specialist.

MB pump replacement parts are also available. For further information call (781)784-1400.

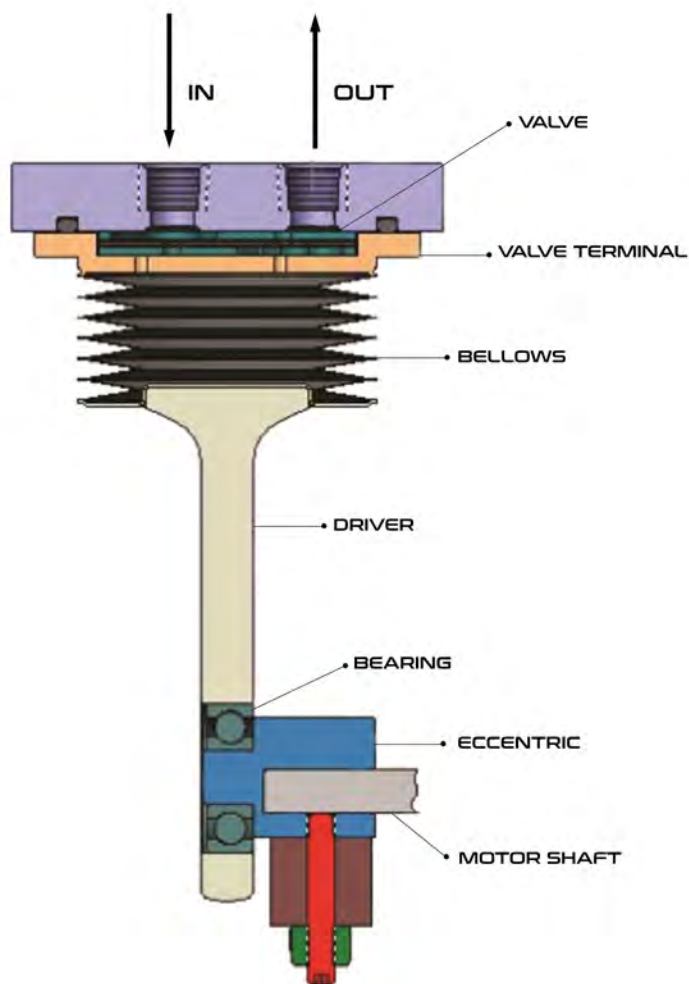
Pumps will pass a reasonable amount of condensation but will be damaged by significant amounts of liquid.

MOTOR ASSEMBLIES

Due to the number of models, call (781) 784-1400 for the latest replacement motor model for your pump type

* Bellows Unit – Bellows, eccentric, bearing, driver terminal, and valve terminal

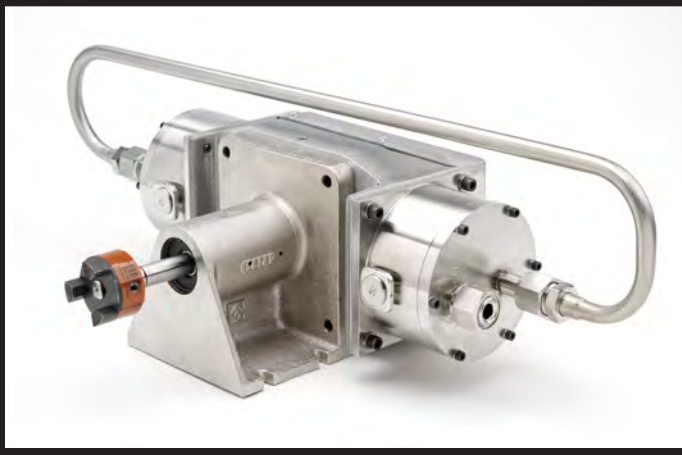
** Bellows Unit – Bellows, valve terminal, and driver terminal



MB SPECIFICATIONS

	MODEL	BELLOWS UNITS	REPLACEMENT DRIVER	VALVE ASSEMBLY	QUANTITY PER PUMP
SINGLE	MB-21	28686*		26328	1
	MB-21 HT	27515*		28905	1
	MB-41	29007*		26328	1
	MB-41 HT	27998*		28905	1
	MB-111	26865*		25871	1
	MB-118	28347*		27995	1
	MB-118 HT	29192*		29568	1
	MB-151	25427*		25871	1
	MB-158	28334*		27995	1
SINGLE	MB-158 HT	29190*		29568	1
	MB-302	29217*	29582	31722	1
	(prior to S/N 1600)	45402**	45403	31722	1
	(S/N 1600 and above)	29670-1**	Factory Only	27456	1
	MB-302 HT				
DUPLEX	MB-601	29670-1**	Factory Only	27456	2
	MB-601 HT	29670-1**	Factory Only	27456	2
	MB-602	29217**	29582	31722	2

DOUBLE CONTAINMENT PUMPS & COMPRESSORS



SPECIFICATIONS

GENERAL

Pressure Shell	300 stainless steel
All other wetted surfaces	300 Series Stainless Steel with either Aluminum O-Rings, Teflon® Valve Gaskets, or Viton® Valve Gaskets
Bellows	AM-350 S.S. (347 S.S. Optional)
Bearings	Permanently lubricated ball type
Port Connections	300 Series stainless steel tubing (length option up to 18") or VCR Weld Glands

ELECTRICAL

Motor Specification	As required by application
Power Rating	1/4 HP to 1 1/2 HP
Operating Speed @ 60 Hz	1725 RPM
Insulation	As required by application

PERFORMANCE

Vacuum	28 inches Hg (maximum, duplex, low pressure)
Pressure	85 PSIG (maximum, MB-601, high pressure)
Flow	5 SCFM free flow (maximum, MB-601)

OPTIONAL FEATURES

Explosion Proof Motor, Leak Detector Port Location Optional, Special Electrical Insulation (Radiation Resistant) and Voltages, Pedestal Mount

FEATURES AND BENEFITS

MB Double Containment Pumps and Compressors solve unique containment problems where radioactive gases are involved or where loss of gas could be hazardous or costly. Using secondary bellows as leak-tight seals, they are used primarily in nuclear industrial applications to control, contain, and distribute the flow of such gases as xenon, krypton, hydrogen, and tritium.

In addition to the conventional inlet-outlet construction of typical compressors, double containment pumps and compressors have a third port connections to a vacuum leak detector that monitors the integrity of the pumping system. They are available in both single and duplex design; for specific models leak rate up to 2x10⁻¹⁰ scc/sec He. Should the bellows rupture due to excessive pressure or contamination, the vacuum would be lost. This would cause a pressure switch or leak detector to be triggered, setting off an alarm and shutting down the system. The pumped gas does not escape.

HIGH PRESSURE MODELS



SPECIFICATIONS

GENERAL

Housing Body	Cast aluminum
Bellows	AM-350 stainless steel
All other wetted surfaces	300 Series Stainless Steel with either Aluminum O-Rings, Teflon® Valve Gaskets, or Viton® Valve Gaskets
Bearings	Permanently lubricated ball type
Port Connections	1/4" or 3/8" NPT

ELECTRICAL

Motor Specification	115/230V 50/60 Hz
Power Rating	1/4 HP to 1 1/2 HP
Operating Speed @ 60 Hz	1725 RPM
Insulation	Class B

PERFORMANCE

Discharge Pressure	100 PSIG (maximum, MB-601)
Flow	5 SCFM free flow (maximum, MB-601)

OPTIONAL FEATURES

Various Motor Types and Voltages, Duplex Model - one or two high pressure stages, VCR Fittings

FEATURES AND BENEFITS

Designed to solve unique pressure problems where contaminant free samples must be processed with leak-tight integrity, these compressors operate at pressures much higher than standard models. They are available in both single and duplex design; for specific models leak rate up to 2×10^{-10} scc/sec He.

MAKING THE CORRECT PUMP SELECTION

When neither the inlet nor the discharge is at atmospheric pressure, a rough sizing of the pump can be determined.

Example:

- Required discharge pressure 12 PSIG
- Required inlet pressure is 10 in Hg.
- Required flow is 1 SCFM

STEP 1. Eliminate all pumps that will not produce sufficient flow, i.e. pumps smaller than the MB-302 will not produce 1 SCFM at 10" Hg not to mention the further constraint of 12 PSIG at the discharge.

STEP 2. Select either the MB-302 or the MB-602.

STEP 3. Selecting the MB-602 draw a vertical line on the pressure curve graph from 12 PSIG to the point where the line intersects the MB-602 flow curve. Read horizontally to flow = 4.4 SCFM (Figure 1)

STEP 4. On the vacuum curve graph draw a line from 4.4 SCFM parallel to the MB-602 flow curve.

STEP 5. Draw a vertical line from 10" Hg intersecting new vacuum flow curve. Read horizontally to flow of approximately 1.3 SCFM (Figure 2)

Note: When results are marginal check with the factory before ordering.

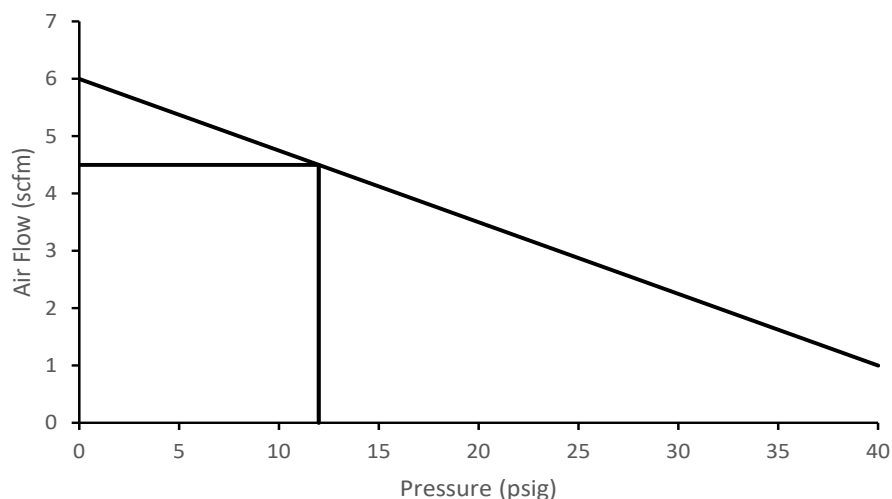


FIGURE 1

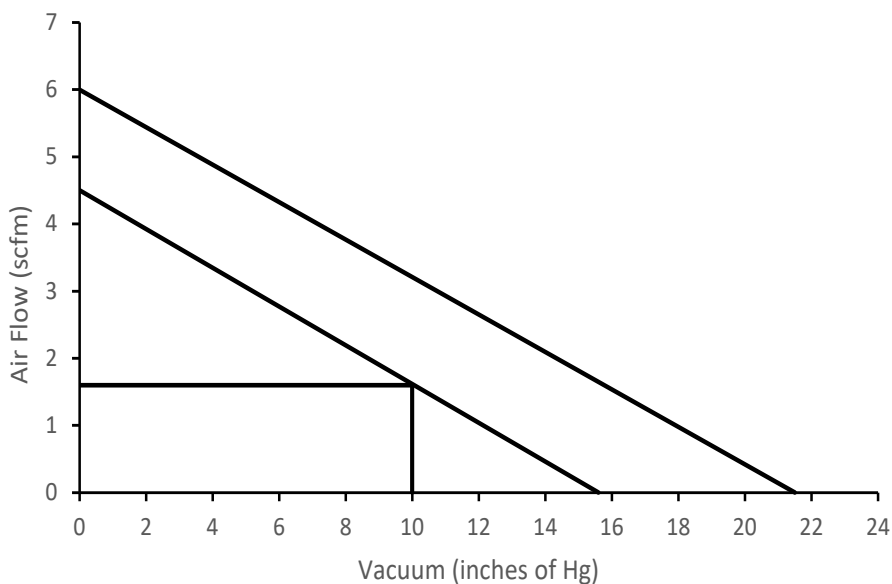


FIGURE 2



PUMP / COMPRESSOR DESIGN DATA SHEET

Senior Operations, LLC
Senior Metal Bellows
1075 Providence Highway
Sharon, MA 02067
Phone: (781) 784-1400
Fax: (781) 784-1405

Technical contact: _____ Company: _____

Phone: _____ Fax: _____ Email: _____

Industry: _____ Application: _____

Pump / Compressor Requirements:

(see page 2 for additional requirements)

- Compressor Flow Rate
- Inlet Pressure
- Outlet Pressure
- Helium Leak Rate
- Max. Startup Pressure
- Proof Pressure
- Burst Pressure

QUANTITY

Quantity of Pumps Required

☐ SCFM ☐ ACFM ☐ SLPM

Units: _____

Units: _____

Units: _____

Units: _____

Units: _____

Units: _____

Temperature & Media Requirements

- Ambient Temperature
- Media Gas
- Max. Gas Temperature
- Min. Gas Temperature
- Relative Humidity

☐ °F ☐ °C

☐ °F ☐ °C

☐ °F ☐ °C

%

Electrical Requirements:

(select all that apply)

- AC Voltage
- Frequency
- Phase ~OR~
- DC Voltage
- DC Motor

☐ 115 ☐ 208 ☐ 230 ☐ 380 ☐ 460 ☐ 575

☐ 50 Hz ☐ 60 Hz ☐ 50/60 Hz ☐ 400 Hz

☐ Single ☐ Three

☐ 12 ☐ 24 ☐ 28 ☐ Other: _____

☐ Brushed ☐ Brushless

Compressor Valve Gasket Material:

☐ Teflon ☐ Viton (Fluorocarbon)

☐ Aluminum O-Ring ☐ Other: _____

Miscellaneous

- Motor Enclosure
- Motor Speed

☐ ODP ☐ TEFC ☐ TENV ☐ XP-Div ¹ Group(s): _____

☐ Single Speed ☐ Variable Speed

Design: (select all that apply)

☐ Integral Mount (motor to pump) ☐ Pedestal Mount

☐ Pedestal Mount with a common base plate

☐ Single Containment

☐ Double Containment

☐ Included Plumbing (if applicable)

Inlet / Outlet Ports:

☐ NPT ☐ Cajon (Metal Seal Style)

☐ Other: _____

Port Specification: _____ Port Size: _____

VISIT WWW.METALBELLOWS.COM FOR EDITABLE FORM

1075 PROVIDENCE HIGHWAY
SHARON, MASSACHUSETTS 02067

PHONE:
781-784-1400
1(800)BELLOWS

FAX:
781-784-1405

WEBSITE :
WWW.METALBELLOWS.COM

EMAIL:
MARKETING@METALBELLOWS.COM

