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IOM Manual
AP50

Diaphragm Pump
50 CFM

Revision 1

AP+

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Introduction

General

Congratulations on your purchase of **AP+ AP50 Diaphragm Pump**.

The Diaphragm Pump AP50 is a 50 CFM high-performance vacuum diaphragm pump designed for continuous duty in demanding industrial, mining, construction, and municipal applications. With heavy-duty forged components, advanced rubber sealing technology, and a modular design, it ensures long service life, minimal downtime, and ease of maintenance.

The AP50 is fully interchangeable with leading OEM diaphragm pumps, making it a versatile choice for both new installations and retrofit projects.

Spare parts are stocked in Australia and via international distribution points, enabling rapid turnaround to minimise downtime.

Disclaimer

This manual provides guidelines for correct installation, operation, and servicing. The manufacturer assumes no liability for personal injury, equipment damage, or downtime caused by improper installation, misuse, negligence, or unauthorized modifications.

Copyright

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Name Plate Information

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Safety Information

Safety Compliance Statment

This pump shall be installed, operated, and maintained in strict compliance with applicable local, state, and national health, safety, and environmental (HSE) regulations, as well as site-specific requirements.

All personnel involved in handling the pump must be trained, competent, and familiar with its operation, associated hazards, and site conditions. Risk assessments shall be completed prior to installation and operation, and appropriate control measures implemented to ensure the safety of personnel, equipment, and the environment.

The pump must only be used within its intended design parameters. Approved lifting techniques and rated equipment must be used for handling, and protective guards shall remain in place during operation.

Only genuine manufacturer-approved parts are to be used for servicing or replacement to maintain performance, warranty, and operational safety.

All activities must adhere to workplace safety standards, hazardous materials regulations, and applicable mechanical and electrical codes. Safe working practices, continuous monitoring, and adherence to site-specific procedures remain the responsibility of the user at all times.

Transportation, Handling and Storage

Upon receipt of the equipment, verify that all items match the packing list, check for transport damage, and report any shortages or damage immediately to both the carrier and Parts Bender Pty Ltd.

Handling and lifting must only be performed by trained personnel in compliance with local safety regulations. Responsibility for safe handling remain the responsibility of the user at all times.

Specific Lifting Instructions

- Improper lifting may cause serious injury or equipment damage.
- Use only the designated lifting, towing, and tie-down points.
- Eyebolts, slings, and spreader bars must be rated and selected for the full load.
- Lift above the centre of gravity to prevent tipping.
- Do not use a forklift unless dedicated forklift pockets are provided.
- Do not use eyebolts on individual components (e.g., pump or motor) to lift the complete assembly.
- Do not attach slings to shaft ends.
- Maximum lift angle from vertical: ±5°.
- Avoid sling angles forming a top triangle angle > 90°.
- Hoisting acceleration must not exceed 0.6 m/sec².

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The figure provided indicate recommended lifting and handling methods. It is provided as guidance only and does not replace site-specific safety procedures.

Installation

Pre-Installation Checks

- Verify pump model, configuration (direct-drive, belt-driven), and serial number against delivery documents.
- Inspect pump, base, and drive components for transport damage.
- Confirm all accessories, fasteners, and pulleys or belts are present.
- Ensure the installation site is clean, level, and capable of supporting pump weight plus dynamic loads.
- Check alignment of base with floor or skid; adjust if necessary.

Foundation and Mounting

- Base securely anchored using appropriate bolts and washers.
- Ensure base is level in both directions.
- Grout or shim if required.
- Confirm adequate clearance around pump for operation, maintenance, and belt access.

Pump Alignment & Drive Setup

- Direct-Drive Pump:
    - Verify pump and motor/driver alignment; tighten mounting bolts to manufacturer torque.
- Belt-Driven Pump:
    - Install pulleys correctly on pump and motor or centrifugal pump shafts.
    - Ensure belts have proper tension according to manufacturer specifications.
    - Verify pulley alignment using straight-edge or laser alignment tools.

- Confirm all mounting bolts and fasteners are tightened to specification.

Piping and Connections

- Suction and discharge piping correctly supported.

Electrical / Drive Checks

- Motor or driver properly installed, wired, and grounded according to local regulations.
- Electrical supply matches motor nameplate (voltage, phase, frequency).
- Pump control and protection devices (overload relays, starters) installed.
- Verify motor rotation direction matches pump requirements.

Safety and PPE

- Guards and covers installed on all rotating or moving parts.
- Lifting and handling equipment rated for weight of pump assembly.

Operational Checks Before Start-Up

- All connections (bolts, hoses, belts) verified and tight.
- Alignment and clearances double-checked.
- No tools or debris remain in pump area.

Commissioning

- Verify all connections are secure and leak-free
- Rotate crankshaft/actuator by hand to verify unobstructed movement
- Energize/pressurize the system gradually and check for leaks or abnormal sounds
- Record initial operating parameters (pressure, airflow, noise levels)

Post-Installation Documentation

- Record serial numbers, installation date, and installer details.
- Note any deviations from standard installation procedures.
- Update maintenance log with baseline inspection and alignment readings.

Operation

Start Up

- Observe initial operation for smooth, steady performance.
- Always start pump within system design limits

Normal Running

- Monitor for smooth, quiet operation.
- Observe monitoring/fault alarms (if equipped) and act promptly on warnings
- Record running hours for maintenance planning

Maintenance

Daily Maintenance

- Visually inspect the pump and assembly area for any leaks, damage, or unusual wear.
- Listen for abnormal noises or vibrations during operation that could indicate mechanical issues.
- Check air supply pressure and ensure it remains within the manufacturer's specified range.
- Monitor suction and discharge flow rates, pressures, and temperature to confirm proper operation.
- Confirm that all valves and connections are tight and secure.
- Ensure the pump area is clean and free of debris to avoid contamination or obstruction.
- Check crank case oil level and top up if required

Weekly Maintenance

- Clean air supply lines to prevent clogging and ensure smooth airflow.
- Inspect diaphragms for visible signs of wear, cracking, or swelling on external surfaces.
- Check suction and discharge lines and fittings for leaks or loose connections, tighten as required.

Monthly Maintenance

- Perform a detailed internal inspection by partially dismantling the pump if possible:
- Inspect diaphragms on both sides for fatigue, punctures, or tears. Replace immediately if damaged.
- Inspect gaskets and seals for deterioration and replace to prevent leaks.

Every 250 Hours or Quarterly Maintenance

- Conduct a performance test: measure flow rates, pressures, and evaluate any unusual noise or vibration to detect early wear or failure.
- Check mounting bolts and fasteners for proper torque and secure any loosened parts.

Annual Maintenance

- Conduct a full teardown inspection and refurbish key components: diaphragms, valves, seals, and gaskets.

- Check shaft alignment and coupling condition between diaphragm and centrifugal pump and realign if necessary.
- Inspect safety devices and controls for proper function.
- Review overall system performance and update maintenance records to identify recurring issues.

Best Practices

- Always follow the manufacturer's detailed maintenance guidelines and torque specifications.
- Use only manufacturer-approved replacement parts to ensure proper fit and performance.
- Keep a maintenance log documenting inspections, parts replaced, and performance tests to optimize scheduling.
- Train personnel on proper pump handling, inspection techniques, and safety procedures.

Trouble Shooting

Problem	Likely Cause	Recommended Action
Pump fails to prime or loses prime	Air leak in suction line A ruptured or worn diaphragm	Check and reseal connections Replace if damaged
Low flow rate	Worn diaphragm, blocked suction Reduced pump speed - worn belt or belt slippage	Replace diaphragm, clean line Replace belt
Excessive vibration or noise	Misalignment, bearing failure Loose mounting bolts or connections	Realign pump/motor, replace bearings Fasten loose bolts and connections
Fluid leakage	Damaged seals or gaskets	Replace seals/gaskets
Overheating	Inadequate ventilation, overload	Improve airflow, check motor load

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Spare Parts

Maintenance Kits and Parts

Kit P/N: KIT-G7C39-0001 **Kit Description**: Bearing Kit AP50 Diaphragm Pump	**Material**	**Qty**	
Double Row Angular Contact Bearing DE		1	
Bearing Shim DE	316 SS	2	
Single Row Cylindrical Roller Bearing NDE		1	
Bearing Shim NDE	316 SS	2	
Bearing Lock Washer		1	
Bearing Lock Nut		1	
Single Row Needle Roller Bearing Connecting Rod		1	
Oil Seal Bearing Cover DE	Nitrile	1	
Locking Ring Crank Shaft		1	
Circlip Crank Shaft		1	
Inner Bearing Ring Crank Shaft Sleeve		1	
Gasket DE Bearing AP50		1	
Gasket NDE Bearing AP50		1	

Kit P/N: KIT-G7C39-0002 **Kit Description**: Elastomer Kit AP50 Diaphragm Pump	**Material**	**Qty**	
Neck Seal	EPDM	1	
Actuator Valve	EPDM	1	
Actuator Seal	EPDM	1	
Inlet/Outlet Valve	EPDM	2	
Inlet/Outlet Gasket	Nitrile	2	
Outlet Nozzle Gasket	Nitrile	1	

Kit P/N: KIT-G7C39-0003 **Kit Description**: Actuator Washer Kit AP50 Diaphragm Pump	**Material**	**Qty**	
Actuator Washer	SS316	1	
Bolt 7/16"-14 UNC X 2"	SS304	1	

Kit P/N: KIT-G7C39-0004 **Kit Description**: Exhaust Hose Kit AP50 Diaphragm Pump	**Material**	**Qty**	
Exhaust Hose	Rubber	1	
Exhaust Hose Clamp	SS316	1	

Kit P/N: KIT-G2C39-0005 **Kit Description**: Actuator Shaft Lip Seal Kit AP50 Diaphragm Pump	**Material**	**Qty**	
O-ring Actuator Shaft	Viton	1	
Lip Seal Actuator Shaft	Viton	2	
Locking Ring Actuator Shaft		1	

Kit P/N: KIT-G2C39-0006 **Kit Description**: Solid Bearing Kit AP50 Diaphragm Pump	**Material**	**Qty**	
Solid Bearing Connecting Rod	Brass	2	

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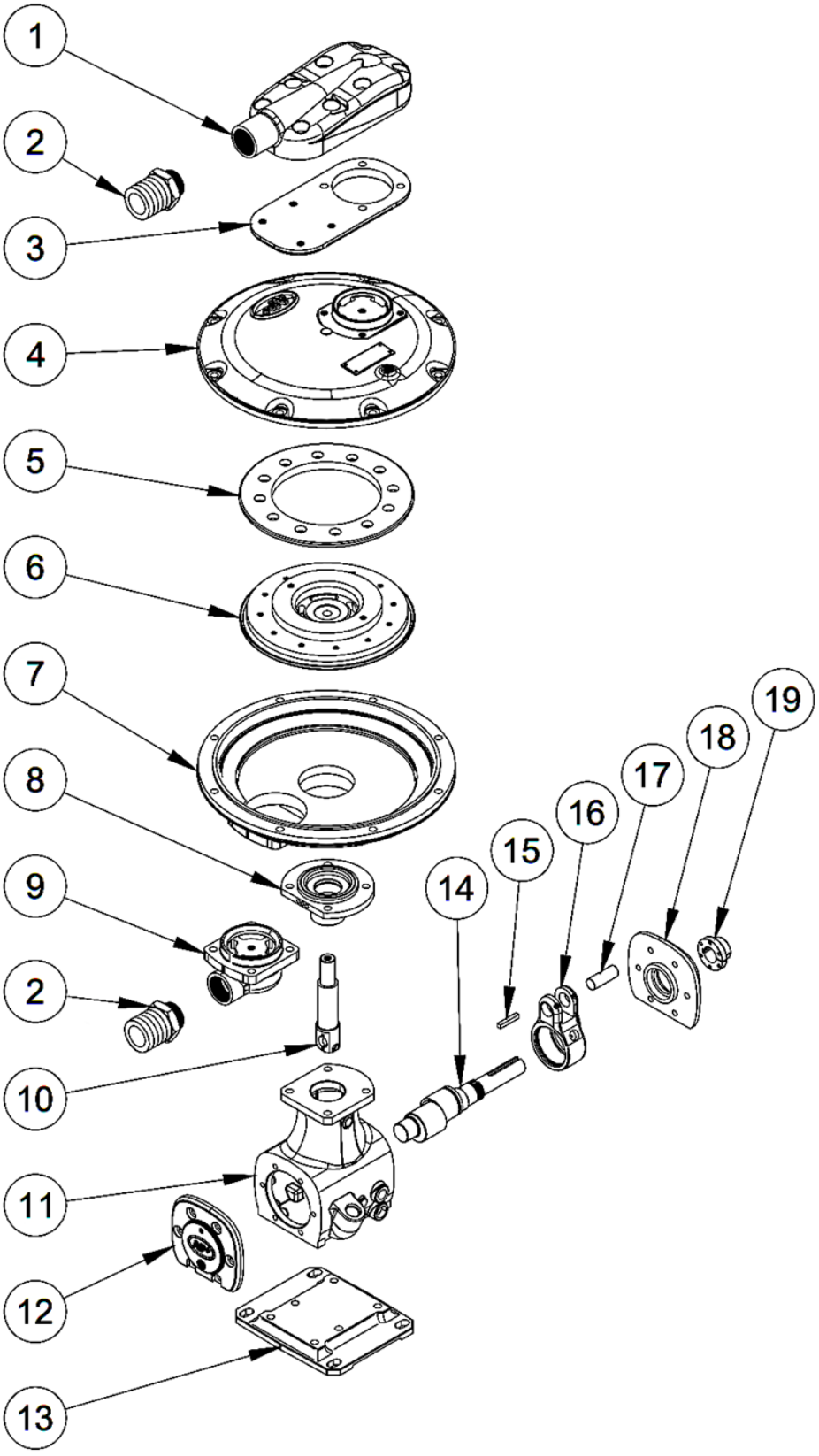
Major Parts



Item	Part Number	Description
1	G7C39-0007-AL3	Outlet Nozzle Upper AP50 50CFM
2	HW-HT-BSPP2X1.25-M-BRA	Hose Tail AP50 50CFM
3	G7C39-0006-AL3	Outlet Nozzle Lower AP50 50CFM
4	G7C39-0002-AL3	Upper Housing AP50 50CFM
5	G7C39-0003-AL3	2 Piece Actuator Upper AP50 50CFM
6	G7C39-0004-AL3	2 Piece Actuator Lower AP50 50CFM
7	G7C39-0001-AL3	Lower Housing AP50 50CFM
8	G7C39-0008-BRA	Actuator Shaft Guide AP50 50CFM
9	G7C39-0005-AL3	Inlet Nozzle AP50 50CFM
10	G7C39-0009-CRM	Actuator Shaft AP50 50CFM
11	G7C39-0011-SG1	Crank Case AP50 50CFM
12	G7C39-0013-SG1	Bearing Cover NDE AP50 50CFM
13	G7C39-0012-SG1	Crank Case Adapter Feet AP50 50CFM
14	G7C39-0010-CRM	Crank Shaft AP50 50CFM
15	G5C39-0020-KS	Key Steel AP50 50CFM
16	G2C39-0012-SG1	Connecting Rod AP50 50CFM
17	G2C39-0014-SS4	Fulcrum Pin AP50 50CFM
18	G7C39-0014-SG1	Bearing Cover DE AP50 50CFM
19	G20C07-0001-STE	QD Bush SK1 AP50 50CFM

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Appendices

Technical Data

Diaphragm Pump AP50 Specifications	
Output	50 cubic Feet per Minute (cfm) 85 cubic metres per hour (m^3/hr) 23.6 Litres / second (l/s)
Suction (maximum)	26.5” of mercury (inHg) 89.7 kilopascal (kPa) 0.89 Bar
Operational Speed (maximum)	1500 rpm
Power Requirement	2 HP (while priming) 1.49 kW
	0.5 HP (when the pump is primed) 0.37 kW
Oil Type	15W40
Oil Capacity	0.13 US gallon (US gal) 0.5 litres
Weight (approximate)	88 pounds (lb) 40 kilograms (kg)

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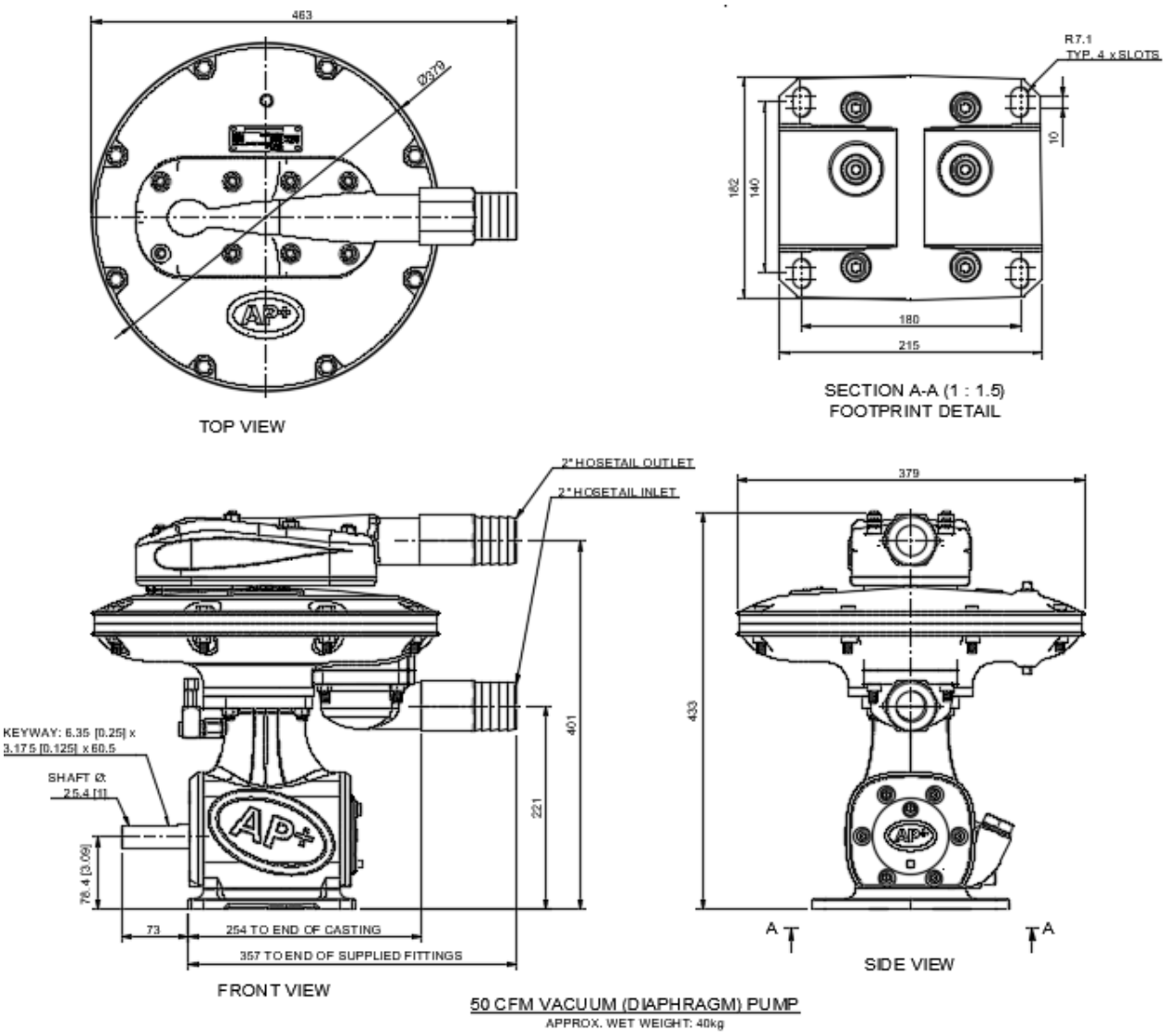
General Arrangement Drawing



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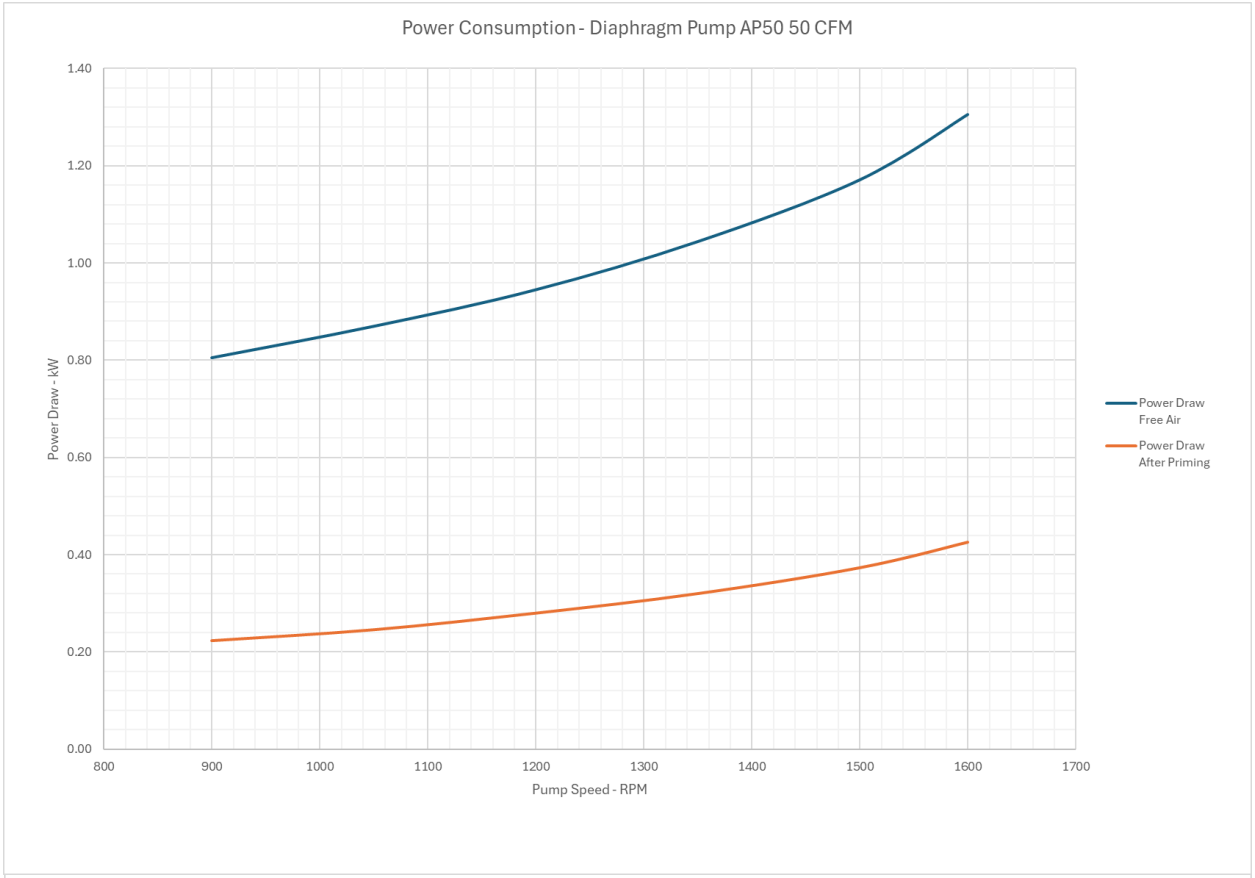
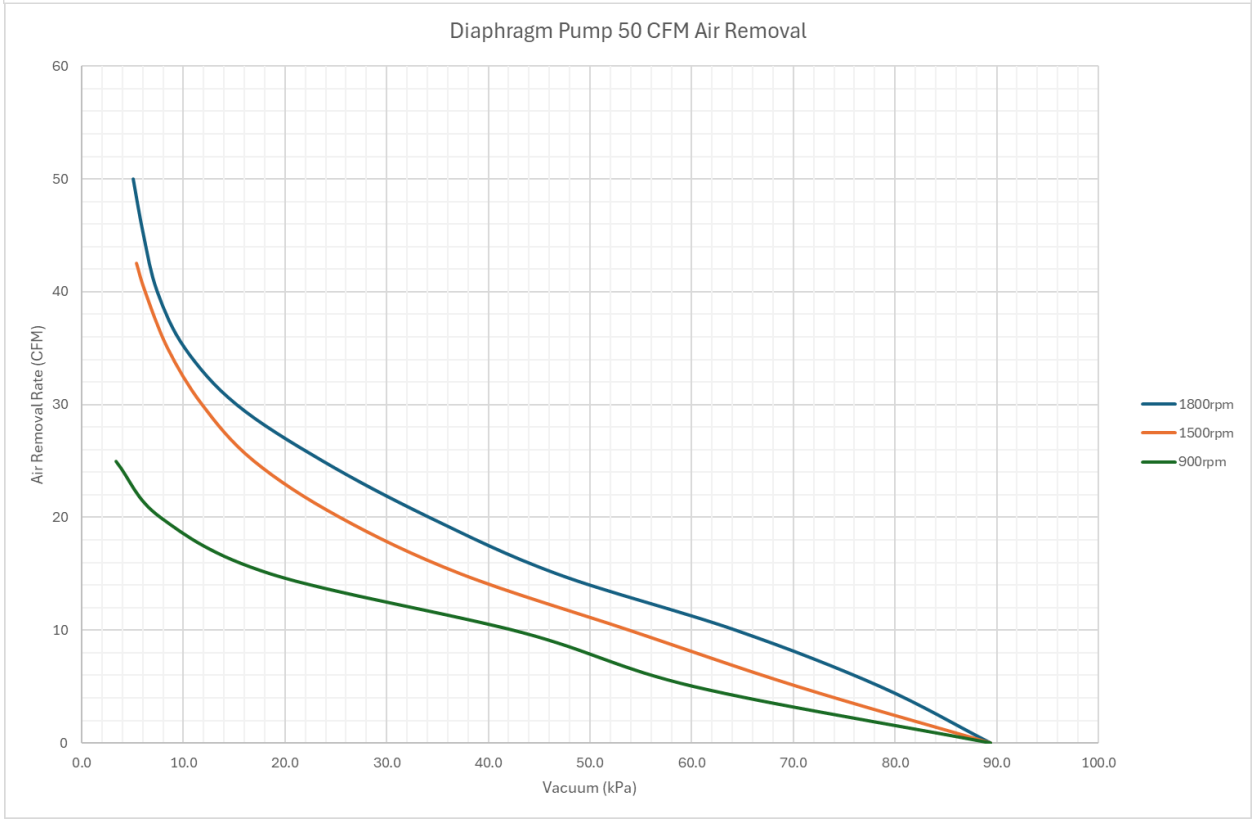
Performance Curves





Warranty Policy

This warranty policy covers any failures of product, under normal installation, operation, and service, which result from defect in material or workmanship from the invoice date.

Faulty Product Return

We provide a 1 (One) Year Warranty for all our products or 2,000 hours of operation, whichever occurs first. It is essential to examine the complete terms and conditions, as they detail the scenarios in which the Warranty is applicable. If the Warranty is applicable and there is a significant defect in the product, you can return it to us within the Warranty Period (you are responsible for covering the return shipping expenses. For more information and specific conditions, please refer to the Return and Refund Policy). We will take one of the following actions: repair or replace the defective product or provide a refund for the defective product's price. However, you will need to fill out and submit, by emailing to admin@partsbender.com, the following "Warranty Application Form" to begin this process.

Owners Responsibilities

Installation, operation and maintaining the product in accordance with installation, maintenance and repair manuals and guidelines.

Provide proof of purchase (invoice date and number) and "Warranty Application Form".

Warranty Limitations and Exclusions

The warranty policy does not cover freight damage, improper storage, installation, misuse, accidents, neglect, lack of maintenance, normal wear and tear, repair, or alteration without prior consent from PartsBender.

PartsBender is not responsible for covering expenses related to the removal and re-installation of the product, including associated costs such as rental equipment for product replacement, labour overtime, freight, downtime expenses, fines, applicable taxes, and other losses resulting from a warrantable failure.

This is the only warranty PartsBender Pty Ltd provides for its product. PartsBender does not offer any other warranties, whether explicit or implicit, including merchantability or suitability for a specific purpose. PartsBender Pty Ltd is not responsible for any incidental or consequential damages under any circumstances.

Once your returned products arrive at PartsBender, we aim to process it within 14 days. To ensure warranty validity, your pump must be serviced regularly.

Return Policy

To make parts easy for you, we've provided a quick and user-friendly summary of the terms regarding returns and cancellations on this page. It is crucial that you take the time to read our terms and conditions.

Faulty Product Return

We provide a One (1) Year Warranty for all our products. It is essential to review the complete terms and conditions, as they detail the scenarios in which the Warranty is applicable. If the Warranty is applicable and there is a significant defect in the product, you can return it to us within the Warranty Period. You are responsible for covering the cost of returning items to us for the purpose of evaluating the warranty claim. We will take one of the following actions: repair or replace the defective product or provide a refund for the defective product's price. To begin this process, you will need to fill out the "Warranty Application Form" and submit it, by email, to admin@partsbender.com.

Change of Mind or Purchased in Error

You have a 30-day window to consider an exchange or refund for most of our products. Please ensure that the product is in a saleable condition, still wrapped in its original, undamaged packaging, and accompanied by the original purchase (invoice) documentation. Return of opened or damaged products and kits will not be accepted. This applies particularly to products currently stocked by PartsBender. For Please fill out "Product Return Form", email to admin@partsbender.com, and enclosed it with the return product/parcel.

We cannot offer a change of mind refund or exchange on the following items:

– Custom-made products, items tailored to specific sizes or specifications

– Unstocked products

– Opened or damaged kits or products (including the packaging)

– Commercial quantities and special project orders

For additional information, please contact us via email at admin@partsbender.com.

Parts Credit and Shipping Refunds

If you return the product within the initial 30 days of delivery, you are entitled to a full credit for the product's total price. However, if the return happens between 30 and 45 days after delivery, you will still receive credit, but with a restocking fee. The restocking fee is calculated as either $55 or 15% of the price, depending on which one is greater.

Once your returned products arrive at PartsBender, we aim to process it within 14 days.

PartsBender Disclaimer, Return & Refund, and Warranty policies and Warranty Application Form can be viewed and downloaded at https://partsbender.com/