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Millivac™ Mini Vacuum Pump

Introduction






The Millivac™ Mini Vacuum Pump is a compact, lightweight, and easy to use pump, designed for small volume/aqueous flask filtration applications. This diaphragm pump has premium, corrosion-resistant wetted parts and is fitted with a patented multi-port valve system that increases performance and tolerates liquids accidentally drawn into the system without loss of performance. The fan-cooled, ball-bearing motor is permanently lubricated and has a single-use (fuse) overload protector. The Millivac™ Mini Vacuum Pump is supplied with tubing and Millex®-FG₅₀ filters.

CAUTION: Always use the supplied Millex®-FG₅₀ filter or a vacuum-flask water trap in conjunction with the pump, as indicated in

Figures 1 and 2. Use this pump to pump air or gas only, not liquids or particulates.


Symbols Used in this User Guide

The following symbols are used throughout this user guide and/or on product labels, and the user shall abide by indicated requirements:

	This safety symbol alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid property damage, possible injury, or death.
	On (Power)
	Off (Power)
	Do not discard with common solid waste at end of life. Segregate with other waste electrical and electronic equipment (WEEE) and send to an appropriate facility for recycling.
	Open housing parts with this label only after unplugging the pump from the power source.

Rules for Safe Operation

Read and understand the information in this user guide before operating the vacuum pump.

	DANGER
<ul style="list-style-type: none">● Do NOT pump flammable or explosive gases or vapors or operate this pump in or near an area containing flammable or explosive gases or vapors.● Do NOT operate in an area where aerosol (spray) products are being used.● Do NOT operate this product near flames.	

Maintenance

Under normal operating conditions, and using proper handling procedures, the Millivac™ Mini Vacuum Pump will provide hours of service-free operation. It requires no lubrication and the heads and valves can be easily disassembled for occasional cleaning and/or replacement of valve plate, seal ring, and diaphragm. Leakage and contamination are the general causes of problems associated with poor vacuum pressure. To operate at maximum efficiency, the pump must be thoroughly clean. If the system is completely clean and free from leaks, and unwarranted vacuum problems still exist, the valve plate, seal ring, and diaphragm may need to be replaced. Refer to instructions below for cleaning and part replacement.

Cleaning and Replacement of Valve Plate, Seal Ring, and Diaphragm (refer to Expanded View of Pump Head)

Materials needed: Replacement kit XF5423055 (includes 1 structured diaphragm, 2 valve plates, and 2 seal rings)

Tools required: Small Phillips-head screwdriver, marking pencil, mild solvent to clean residue from heads



WARNING: Shut off all power to pump before disassembly. Unplug pump's power cord from electrical source.

1. Be sure pump is dry and free of hazardous materials by operating it for 5 minutes in free air.
2. Mark the relative position of the head parts with a pencil line to ensure correct assembly later. It is not necessary to remove the hose barbs.
3. Remove the 4 perimeter head screws **B** on the pump head.
4. Lift the head assembly and rubber skirt straight up and place on a clean, flat work surface.
5. Carefully separate the headplate **A** from the intermediate plate **C**. Two seal rings and two valve plates are now exposed.
6. Remove seal rings **E** and valve plate **D**. Carefully clean any residue from the valve seats with a mild solvent. Do not scratch the PPS surfaces. The area around the valve plate must be smooth and dry. If pitting of the pump parts or tearing of the diaphragm is observed, it is possible that the gas/vapor being pumped is attacking the wetted parts of the pump. Chemical resistance charts should be consulted if you are in doubt. Generally, replacement of the diaphragm, seal rings and valve plates will restore the pump to operating specifications.
7. Install new seal rings **E** and valve plates **D** from the spare parts kit, if required. Skip to step 11 to reassemble head without replacing diaphragm.

To replace the diaphragm:

NOTE: There are a number of small shim rings **J** located between the diaphragm and the diaphragm support cup **G** and between the diaphragm support cup **G** and the connecting rod **M**. Use care when disassembling the diaphragm so that you can note the quantity, position, and thickness of the shim rings. These shim rings must be reinstalled in the original quantity and position for proper pump operation (see expanded view).

8. Carefully lift the diaphragm **F** edge from the circular groove, and begin to unscrew the diaphragm from connecting rod **M** by hand. Before completely unscrewing the diaphragm, flip the pump upside down and complete removal of the diaphragm. This will prevent the small shims on the diaphragm's threaded stud from falling into the chamber.
9. Hint: It may be easier to perform the following step by holding the pump upside down, or placing it on its switch end on a flat surface before screwing the assembled parts into connecting rod **M**.

Assemble all of the components according to the diagram, over the threaded stud end of replacement diaphragm **F** and align the stud with the threaded hole of connecting rod **M** in the chamber. Be sure all parts are centered. Screw the new diaphragm into the connecting rod by hand. Do not overtighten.

10. Once installed, press down on the diaphragm until the lip on the edge of the diaphragm fits into the groove on the rim of the mounting flange.
11. Reassemble the headplate **A** (note guide pin), and intermediate plate **C** in accordance with the mark you made in step 2.
12. Replace the pump head assembly and tighten head screws **B** snugly in a crosswise pattern. Do not overtighten screws.
13. Replace rubber protective boot.

Specifications

Performance

Vacuum pressure	10 kPa absolute (3.0 in. Hg absolute, 27 in. Hg gauge)
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Dimensions

Length	22.6 cm (8.9 in.)
Width	9 cm (3.5 in.)
Height	14.1 cm (5.6 in.)
Weight (approximate)	1.9 kg (4.2 lb)
Tubing Connectors	6 mm (1/8 in. NPT) x hose barb for 6.4 mm (1/4 in.) ID tubing

Materials of Construction

Pump Wetted Parts	Polyphenylene sulfide (PPS) head, ethylene propylene diene monomer (EPDM) diaphragm, fluorinated polypropylene monomer (FPM) valves and seals
Tubing Connectors	Polyethylene

Electrical Specifications

115 V (60 Hz)	3 conductor (grounded) power cord; protection class IP20
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Product Ordering Information

This section lists the catalogue numbers for the Millivac™ Mini Vacuum Pump and accessories.

Description	Catalogue Number
Millivac™ Mini Vacuum Pump, 115 V (60 Hz)	XX5411560
Millivac™ Mini Vacuum Pump, 230V (50 Hz)	XF5423050
Accessories	
Millex®-FG ₅₀ filter unit, 0.2 µm hydrophobic PTFE, 10/pk	SLFG05010
Tubing, 4.8 mm (3/16 in.) ID x 140 cm (4.6 ft) silicone	XX7100004
Vacuum filtering flask, 1 L	XX1004705
No. 8 stopper, 9.5 mm (3/8 in.) hole, silicone, 5/pk	XX2004718

Notice

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