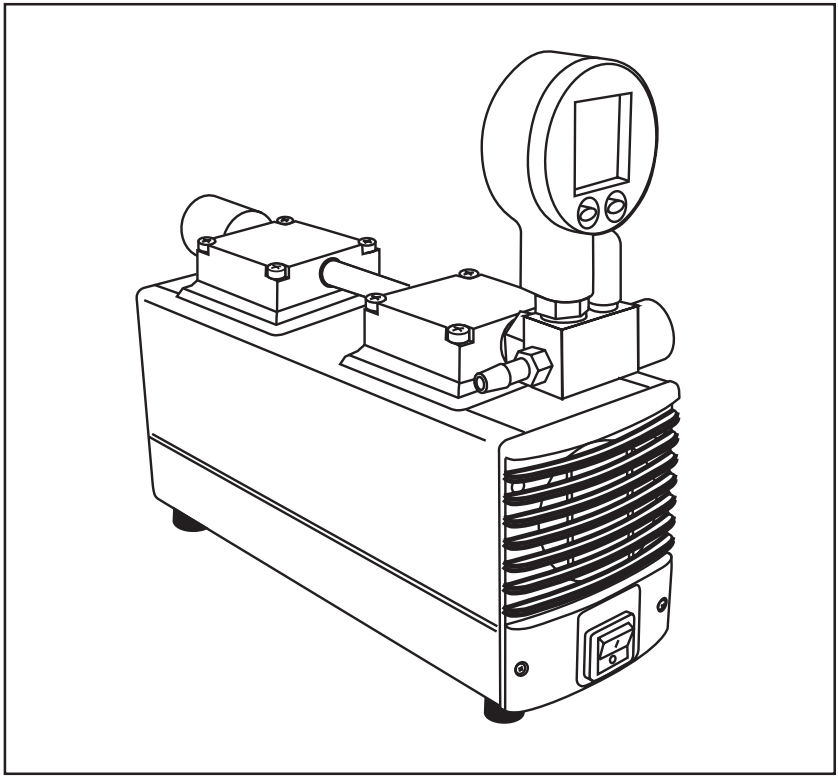
Millivac™ Maxi Diaphragm Pump

Catalogue No.
SD1P014M04 (230 V, 50 Hz)



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CE

Introduction

The Millivac Maxi Diaphragm Pump is a double-head, dry-running device used in a wide range of laboratory applications including those that require pumping slightly aggressive or corrosive gases and vapors. This pump works without oil lubrication, eliminating oil vapors that might pollute the transferred, evacuated or compressed air. The design of this small pump includes a patented diaphragm for maintenance-free service for a minimum of one year. The design is also gastight with a leakage rate of approximately 6×10^{-3} mbar × l/s.

CAUTION: Always use a hydrophobic vent filter or a vacuum-flask water trap in conjunction with the pump. (See Figures 1 and 2.) Never pump or draw liquids through the pump, as this will damage the pump.

Usage Guidelines

- Always use the Millex®-FG_{50} vent filter and silicone tubing included with the pump when applying vacuum. This will prevent liquids or vapors from entering the Millivac Maxi Pump. A properly attached Millex-FG_{50} vent filter is illustrated in Figure 1.
- For maximum protection of the pump, use a Millex-FG_{50} vent filter AND a vacuum trap to protect the pump from vapors and gases. The vacuum trap consists of a 1 liter filtering flask (Millipore cat. no. XX10 047 05), No. 8 stopper (XX10 047 08) and silicone tubing. Additional tubing is available as Millipore cat. no. XX80 000 24. This assembly is illustrated in Figure 2.
- Never pump or draw liquids through the pump. This will damage the pump. The filter flask and vacuum trap should be emptied after each use.

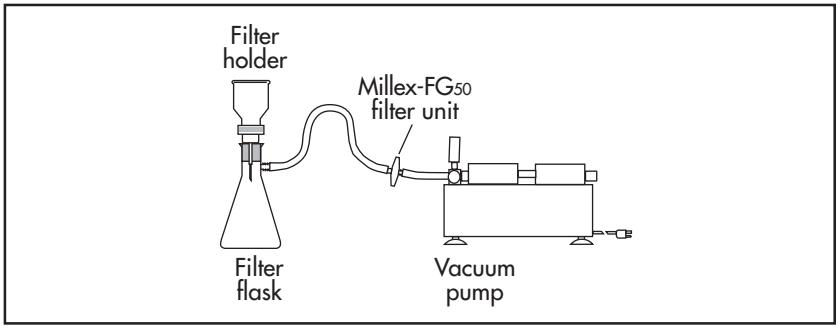


Figure 1. Proper use of Millex-FG_{50} filter.

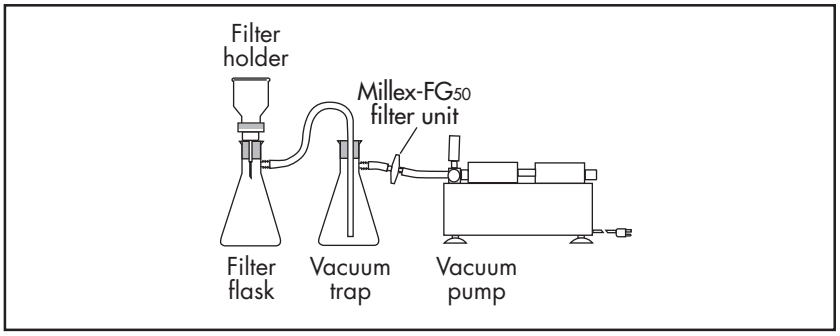


Figure 2. Proper use of vacuum trap and Millex-FG_{50} filter.

Rules for Safe Operation

▲WARNING: The motor is thermally protected and will automatically restart unexpectedly when the overload device resets. Do NOT pump flammable or explosive gases or vapors or operate this pump in an atmosphere containing flammable or explosive gases or vapors.

▲WARNING: Use of this pump in a manner not specifically stated in this user guide could result in severe bodily injury.

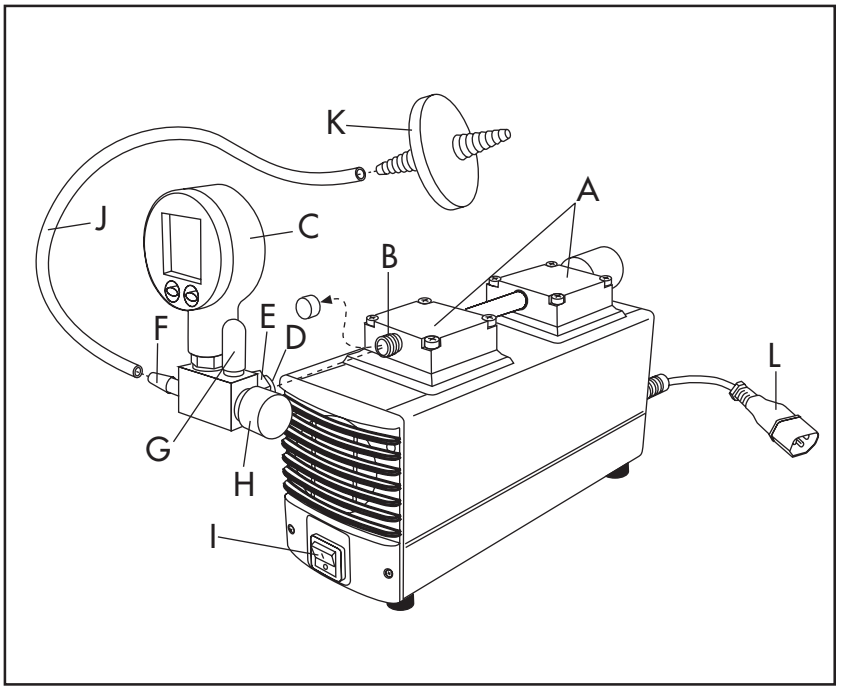
Read and understand the information in this owner's manual before operating the pressure/vacuum pump.

- The vacuum pump should be operated in a dry clean and well ventilated area.
- When the unit is not in use, wrap the power cord around the vacuum pump and store in a dry place. Do not abuse the cord.
- Replace the Millex-FG_{50} vent filter (SLFG 050 10) if necessary.
- Inspect hose, plug and cord for signs of damage before use. Do not use if a deficiency is found. Never operate a damaged unit. Contact Millipore for replacement parts; see Technical Assistance section for details.
- This vacuum pump needs no lubrication. Applying oil to any part could result in polluted air delivery to the air-handling equipment and will damage the pump.
- To operate at maximum efficiency, the pump system must be thoroughly clean. Refer to the Maintenance section for details on properly cleaning the pump.
- All vacuum pumps generate heat, even under normal operating conditions. To avoid serious burns, never touch the head parts and tubing, during and immediately after operation.
- Do not carry the pump by the tube that runs between the two heads. This is not a handle and will not bear the weight of the pump.

Set Up

Remove the pump and its components from the packing material. Use the diagram below to identify the parts of the Millivac Maxi pump.

Pump Components



A	Pump heads
B	Pump head connector
C	Digital vacuum gauge
D	Digital vacuum gauge connector
E	Nut
F	Vacuum port
G	Bleeder valve
H	Regulator knob
I	On/off switch
J	Tubing
K	Millex-FG_{50} filter unit
L	Electrical pigtail

Install the Battery

1. Insert a coin into the slot in the back of the digital vacuum gauge and remove the cover.
2. Install the battery (type CR2430) between the metal prongs, with the "+" side facing out. Replace the cover.

Attach the Digital Vacuum Gauge

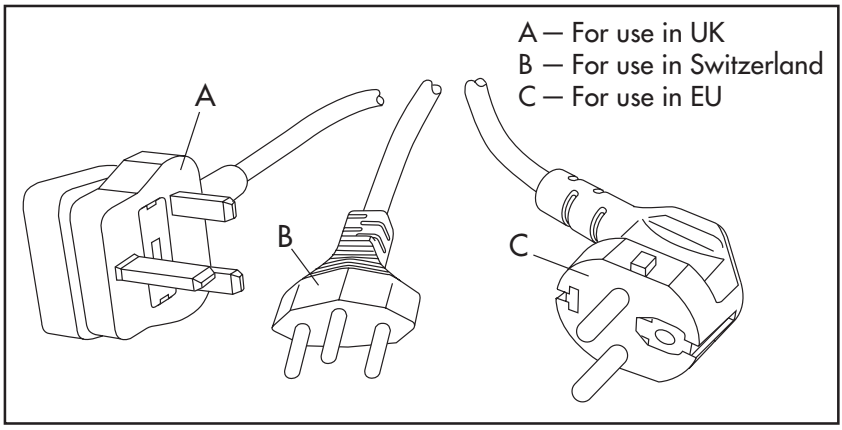
1. Remove the plastic cap from the threaded connector on the pump head.
2. Reveal the corresponding digital vacuum gauge connector and O-ring by sliding the nut toward the body of the gauge.
3. Align the connectors and then slide the nut onto the threads of the pump head connector and hand tighten by turning the nut clockwise.
4. Tighten nut securely using a 3/4" or 19 mm wrench.

Attach the Tubing

1. Attach the supplied tubing to the pump by pressing it onto the vacuum port on the digital vacuum gauge.
2. Insert the Millex-FG_{50} filter device into other end of the tubing.
3. Connect tubing from appropriate filtration device onto the free outlet of the Millex-FG_{50} device.

Connect the Power Cord

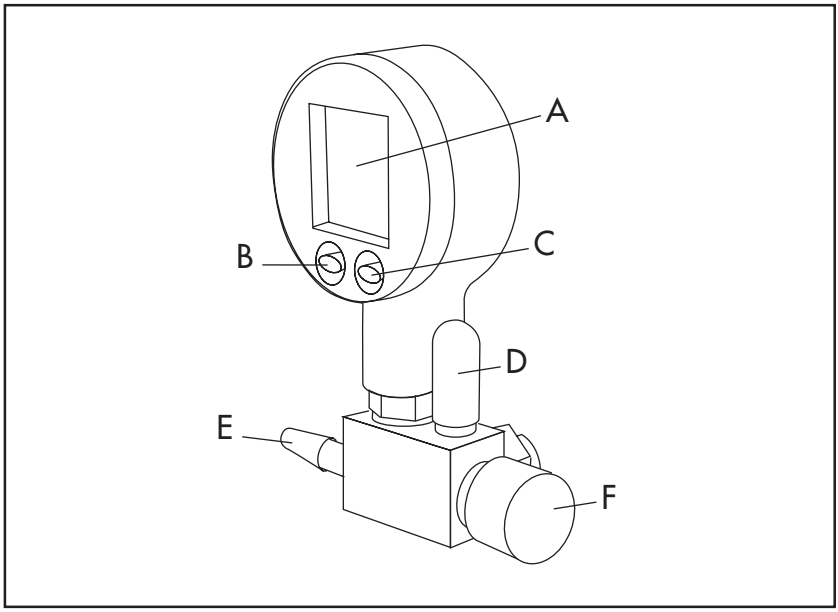
The Millivac Maxi pump is shipped with three different power cords. Connect the appropriate power cord to the pump's electrical pigtail and then plug into an electrical outlet.



Set the Digital Vacuum Gauge Values

Use the diagram below to identify the parts of the digital vacuum gauge.

Gauge Components



A Gauge screen
B Select key
C Enter key
D Bleeder valve
E Vacuum port
F Regulator knob

Turn on Digital Vacuum Gauge

Press the Select key to turn the digital vacuum gauge on. When first turned on, the gauge will flash the full-scale pressure range and the software version (year/week). After that the actual pressure displays at the top of the screen and the last measured MAX value shows at the bottom of the screen. View the MIN value for 5 seconds by pressing the Enter key.

NOTE: The digital vacuum gauge will turn on automatically when the battery is first installed.

Digital Gauge Functions

Turn the regulator knob all the way closed to assure full vacuum before setting the digital gauge functions.

Press the Select key to select the gauge's various functions and the pressure units. Press the Enter key to activate the selected function or pressure unit.

NOTE: If the Enter key is not pressed within 5 seconds of selecting the function, the gauge returns to the measuring mode without changing any settings.

Pressing the Select key scrolls through the following functions: Reset, Off, and Mano.

Starting at initial display screen:

RESET

Press the Select key once to choose Reset. Press Enter to set the MIN/MAX values to the actual pressure.

OFF

Press the Select key twice to choose Off. Press Enter to turn the digital vacuum gauge off.

MANO

Press the Select key three times and then press Enter to choose Mano. Mano allows access to a number of functions. Press Select until the desired function is displayed and then press Enter to select the function.

Zero Set:	Sets a new zero reference at atmospheric pressure. Use for measurement of relative pressure.
Zero Res:	Sets the zero back to the factory default setting (0 bar absolute).
Cont On:	Deactivates the automatic turn-off function. (Used when pumping large quantities of sample.)
Cont Off:	Activates the automatic turn-off function. (The pump turns off 15 minutes after the last key function.)
Unit Selection:	Scrolls through to display measurements in bar, mbar/hPa, kPa, MPa, PSI, kp/cm^2.

These functions must be set at first use. Turning the pump on and off will not affect the chosen settings.

Measurement Ranges and Calibration

Pressure:	0–1200 mbar ab
Compensated temperature range:	0–50 °C
Precision at room temperature (% MR)	± 0.25
Resolution	1 mbar

If a pressure can not be displayed, the message OFL (Overflow) or UFL (Underflow) will appear on the gauge screen. If a pressure outside the measurement range of the vacuum gauge is applied, the last pressure value is displayed blinking. In both of these cases, recalibrate the pump or check tubing connections. If problems continue, contact Millipore Technical Service.

Pump the Sample

When the digital vacuum gauge is set to the appropriate values, begin pumping by turning on the on/off switch on the front of the pump. When pumping is complete, turn off the unit using the on/off switch. To reduce vacuum flow without using the digital vacuum gauge, turn the regulator knob counter-clockwise to the open position.

Maintenance

Under normal operating conditions, and using proper handling procedures, the Millivac Maxi Pump should provide many hours of trouble-free operation. These durable units are built for quiet continuous duty operation. Millivac Maxi Pumps are 100% oil-free. The pump employs a non-lube piston and cylinder. No maintenance is necessary for the bearings. All bearings are sealed and permanently lubricated.

CAUTION: Do not lubricate any of the parts with oil, grease or petroleum products. Do not clean with acids, caustics or chlorinated solvents. Do not replace the connecting rod or motor bearings.

Use mild soap or standard laboratory detergent, bleach, or ethyl alcohol to clean all surfaces of the Millivac Maxi Pump. After cleaning, rinse off any residue with a soft cloth or paper towel dampened in clean water, then wipe dry. You can also use radioactive decontamination solutions and sprays.

NOTE: Do not autoclave the Millivac Maxi Pump.

Performance

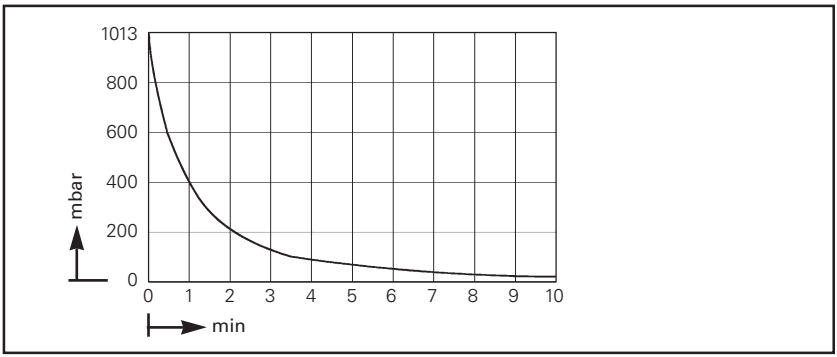


Figure 3. Pump down time for 10 L receiver.

Specifications

Materials	Diaphragm: Polytetrafluoroethylene (PTFE) Valve plate: Perfluoroelastomer (FFPM) Head pump: Polyphenylsulfid (PPS)
Size	361 mm × 141 mm × 90 mm
Weight	3.95 kg
Voltage	50 Hz, AC power
Maximum speed	50 rpm
Operating pressure	0.5 bar
Flow rate	16 L/min
Ultimate vacuum	20 mbar abs.
Operating temperature	5 °C to 40 °C
Motor protection	IP20
Connectors for tube	ID 6 mm

CE — Declaration of Conformity

Millipore Corporation certifies that this product complies with the following European Union Directives:

Electromagnetic Compatibility (EMC) Directive 89/336/EEC

Equipment Intended for Use in Potentially Explosive Atmospheres (ATEX) Directive 94/9/CE

Technical Assistance

For more information, contact the Millipore office nearest you. In the U.S., call **1-800-MILLIPORE** (1-800-645-5476). Outside the U.S., see your Millipore catalogue for the phone number of the office nearest you or go to our web site at www.millipore.com/offices for up-to-date worldwide contact information. You can also visit the tech service page on our web site at www.millipore.com/techservice.

Product Ordering Information

This section lists the catalogue numbers for the peristaltic pump assembly. See the Technical Assistance section for information about contacting Millipore. You can also buy Millipore products on-line at www.millipore.com/purecommerce.

Description	Cat. No.
Millivac Maxi Diaphragm Pump, 115V/60 Hz	SD1P014M04
Tubing, Silicone (3/16" I.D. × 3/8" O.D., 25 ft.)	XX80 000 24
Millex-FG_{50} filter unit, 10/pk	SLFG 050 10

Standard Warranty

Millipore Corporation ("Millipore") warrants its products will meet their applicable published specifications when used in accordance with their applicable instructions for a period of one year from shipment of the products. **MILLIPORE MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THERE IS NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** The warranty provided herein and the data, specifications and descriptions of Millipore products appearing in Millipore's published catalogues and product literature may not be altered except by express written agreement signed by an officer of Millipore. Representations, oral or written, which are inconsistent with this warranty or such publications are not authorized and if given, should not be relied upon.

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