User Guide

Samplicity® G2 Filtration System with Millex Samplicity® and Millex® Filters



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Introduction

The Samplicity® G2 Filtration System is a vacuum-based system that simultaneously filters multiple samples directly into standard HPLC vials. It can filter up to eight samples, even those with high viscosity or particulates, in seconds. Samples can be filtered with either disposable Millex Samplicity® filters or conventional 33 mm Millex® filters. Millex Samplicity® filters come in strips of four for fast setup, but can be separated at the perforations to filter fewer samples. The disposable Millex® filters come with separate funnels that are inserted before use. In both cases, the funnel entrance to the filter allows quick and easy loading with a pipettor, providing a convenient, ergonomic alternative to syringe filters. Filtered samples are immediately ready for subsequent analyses.

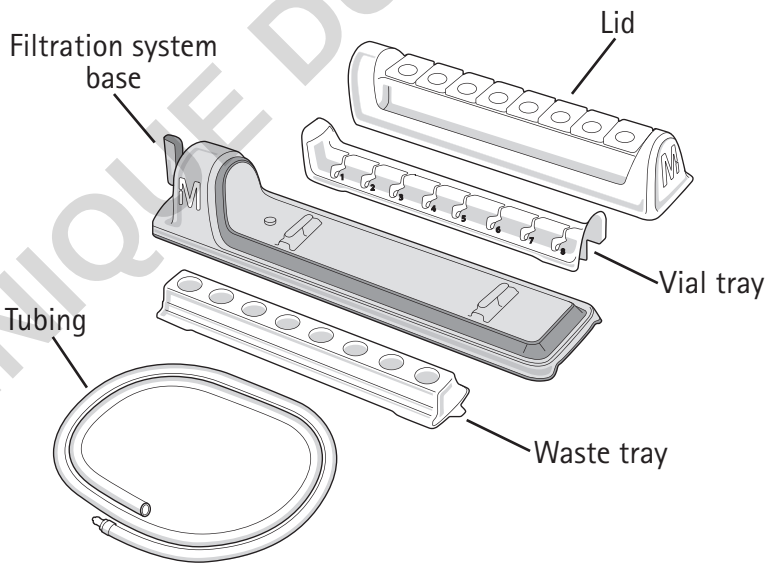
NOTE: All instances of Millex® filters cited in this User Guide refer to Millex® filters for the Samplicity® G2 system, which are sold with adapter funnels.

Applications include sample preparation for dissolution testing, high performance liquid chromatography (HPLC), ultra-high performance liquid chromatography (UHPLC or UPLC®), and liquid chromatography-mass spectrometry (LC-MS).

The Samplicity® G2 Filtration System and its associated filters are intended for use in a GLP (Good Laboratory Practice) environment.

Samplicity® G2 Filtration System Components

The Samplicity® G2 Filtration System includes the following components:



NOTE: In order to use the original Samplicity® Filtration System with Millex® filters, you must purchase the new Samplicity® G2 lid.

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Safety Precautions

- Use a vacuum source appropriate for the samples being filtered.
- Protect the vacuum source from contamination with an in-line filter (e.g., Millex®-FA50 filter).

Chemical Compatibility

Millex Samplicity® and Millex® Filters Chemical Compatibility

Millex Samplicity® and Millex® filters are compatible with aqueous and mild organic solutions. They can be used to filter the agents listed in the following tables. This information was developed from technical publications, materials suppliers, and laboratory tests, and is believed to be accurate and reliable. However, because of variability in temperature, concentrations, exposure time, and other factors outside of our control that may affect the use of the filter, no warranty is given or is to be implied with respect to such information. Agents not listed below should be tested with the Millex Samplicity® or Millex® filter prior to use.

Millex Samplicity® Polytetrafluoroethylene (PTFE) Filter Compatibility



Acetic acid, glacial	Dimethyl sulfoxide	Isopropyl acetate	
Acetone	Dioxane	Isopropyl alcohol	Phenol (10%)
Acetonitrile	Ethers	Kerosene	Pyridine
Amyl acetate	Ethyl acetate	Methyl alcohol	Silicone oils
Amyl alcohol	Ethyl alcohol	Methylene chloride	Sulfuric acid
Benzyl alcohol (1%)	Ethylene glycol	Methyl ethyl ketone	Tetrahydrofuran
Boric acid	Formaldehyde	Methyl isobutyl ketone	Toluene
Brine (sea water)	Gasoline	Nitric acid	Trichloroethane
Butyl alcohol	Glycerine (Glycerol)	Nitrobenzene	Trichloroethylene
Cellosolve® (ethyl) solvent	Hexane	Paraldehyde	Trifluoroacetic acid
Chloroform	Hydrochloric acid	Pentane	Xylene
Cyclohexanone	Hydrofluoric acid	Perchloroethylene	
Dimethyl acetamide	Hydrogen peroxide (30%)	Petroleum based oils	
Dimethyl formamide	Isobutyl alcohol	Petroleum ether	

NOTE: For low extractable HPLC applications, we recommend either discarding the first 1 mL or rinsing the filter with 1 mL of primary solvent before sample filtration.

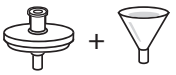
Millex Samplicity® Polyvinylidene Fluoride (PVDF) Filter Compatibility



Acetic acid, glacial	Cellosolve® (ethyl) solvent	Glycerine (glycerol)	
Acetonitrile	Chloroform	Hydrochloric acid	Sulfuric acid (3 N)
Ammonium hydroxide	Cyclohexanone	Hydrofluoric acid	Toluene
Amyl alcohol	Ethyl alcohol	Hydrogen peroxide (10%)	Trifluoroacetic acid
Benzene	Ethylene glycol	Kerosene	Xylene
Boric acid	Formaldehyde	Methyl alcohol	
Brine (sea water)	Formic acid	Petroleum based oils	
Carbon tetrachloride	Gasoline	Phenol (10%)	

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Chemical Compatibility, continued



Millex® Filter Compatibility

Acetic acid, glacial	Dimethylacetamide[1]	Hydrogen peroxide (3%)	Pentane
Acetonitrile	Dimethylformamide[1]	Isobutyl alcohol	Perchloroethylene
Amyl acetate	Dioxane	Isopropyl acetate	Petroleum based oils
Amyl alcohol	Ethers	Isopropyl alcohol	Petroleum ether
Benzene	Ethyl acetate	Kerosene	Phenol (10%)
Benzyl alcohol	Ethyl alcohol	Methyl alcohol	Silicone oils
Boric acid	Ethylene glycol	Methylene chloride	Sulfuric acid (3 N)
Brine (sea water)	Formaldehyde	Methyl ethyl ketone	Tetrahydrofuran
Butyl alcohol	Gasoline	Methyl isobutyl ketone	Toluene
Carbon tetrachloride	Glycerine (glycerol)	Mineral spirits	Trichloroethane
Cellosolve® (ethyl) solvent	Hexane	Nitrobenzene	Trichloroethylene
Chloroform	Hydrochloric acid[2]	Ozone (10 ppm in water)	Trifluoroacetic acid
Cyclohexane	Hydrofluoric acid	Paraldehyde	Xylene

[1] Not compatible with GV and HV

[2] Hydrochloric acid (6 N) not compatible with GN and HN

NOTE: For low extractable HPLC applications, we recommend either discarding the first 1 mL or rinsing the filter with 1 to 2 mL of primary solvent before sample filtration.

Samplicity® G2 Filtration System Chemical Compatibility

The Samplicity® G2 Filtration System is compatible with aqueous acid and base solutions, methyl alcohol, ethyl alcohol, isopropyl alcohol, acetonitrile, 40% dimethyl formamide, dimethyl sulfoxide, and 5–10% organic solvents in water.

The waste tray is compatible with weak acids, organic solvents, alcohols, and fuels.

General Guidelines

- Vacuum should remain off while system is being assembled.
- Vacuum pressure of 610–847 millibar (mbar) [18–25 inches (in.) Hg] at 30 L/min is recommended for optimum performance.
- The waste tray can be used in place of the vial tray when washing or flushing the filters prior to sample filtration.
- When pre-washing or flushing the filters, wait for approximately 10 seconds (until complete release of vacuum) before removing the lid and waste tray.
- Ensure proper alignment of vials to filters when assembling the vial tray.
- Doors above empty positions must be closed during operation.
- Do not turn on vacuum until after samples have been added to filters.
- Make sure that **all** samples have filtered into vials before turning vacuum off. Some samples may take longer to process.
- System must be turned off (system handle UP) and pressure allowed to release through the bleeder orifice before removing filters and lid or opening doors. Cross-contamination may occur if filters, lid, or doors are moved before vacuum pressure is fully released.

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Materials Required

Vacuum source capable of 610–847 mbar (18–25 in. Hg) at 30 L/min

Pipette and pipette tips

Sample vials (12 × 32 mm)

Millex Samplicity® Filters for the Samplicity® G2 Filtration System

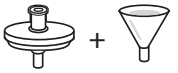
- 0.20 µm hydrophilic PTFE filter
- 0.45 µm hydrophilic PTFE filter
- 0.45 µm hydrophilic PVDF filter



OR

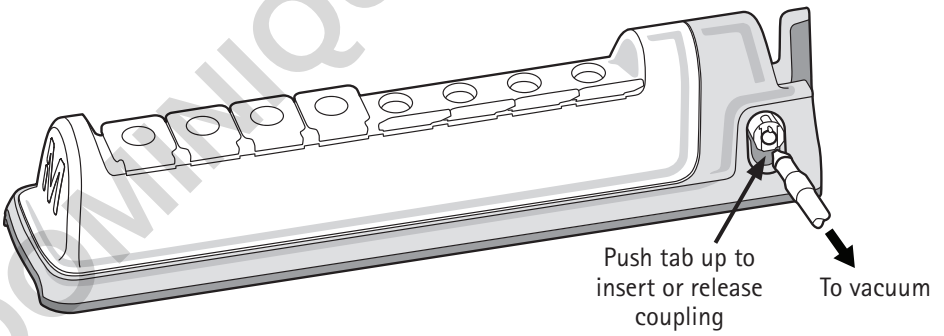
Millex® Filters for the Samplicity® G2 Filtration System

- 0.22 µm hydrophilic PVDF filter
- 0.45 µm hydrophilic PVDF filter
- 0.20 µm hydrophilic nylon filter
- 0.45 µm hydrophilic nylon filter
- 0.22 µm hydrophilic polyethersulfone (PES) filter
- 0.45 µm hydrophilic PES filter



How to Use the Samplicity® G2 Filtration System

1. Place the Samplicity® G2 Filtration System base on a level bench top.
2. With vacuum source OFF and system handle in the OFF position, attach the vacuum tubing to the back of the system by pushing the coupling insert on the end of the tubing into the quick-disconnect fitting on the system base until it clicks.

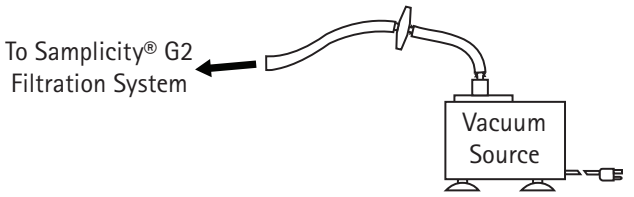


NOTE: To disconnect the tubing, push the tab below the tubing connector up with the index finger and pull tubing out.

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How to Use the Samplicity® G2 Filtration System, continued

3. Connect the other end of the tubing to a vacuum source. Use a Millex®-FA$_{50}$ filter to protect the vacuum source from contamination.



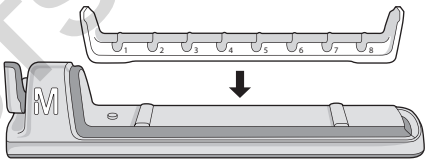
NOTE: Any vacuum source which can deliver 474 mbar (14 in. Hg) at 20 L/min is sufficient.

A vacuum flask trap may be used; however, if the vacuum source is a pump rather than a central vacuum system, it may take longer to achieve the required vacuum pressure.

When setting up the system, avoid crimping the tubing, as this can reduce vacuum pressure.

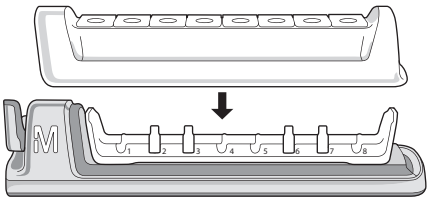
CAUTION: Do not allow the in-line Millex®-FA$_{50}$ filter to get wet; this will block flow of vacuum.

4. Place vial tray on system base with tray numbers facing forward.

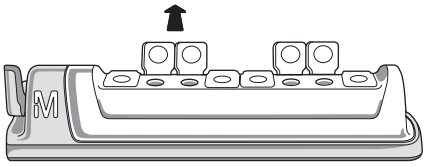


5. Place one to eight uncapped HPLC vials (12 × 32 mm) in the vial tray and place lid over vials.

NOTE: To wash filters prior to sample filtration, install the waste tray in place of vials. Follow steps 6–10, using the appropriate solvent/ sample to wash the filters. Then, replace the waste tray with vial tray and vials, and process samples beginning with step 8.



6. Open doors directly above the positions where vials have been installed. Close doors above empty positions.



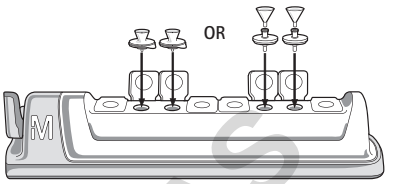
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How to Use the Samplicity® G2 Filtration System, continued

7. For Millex Samplicity® filters, place one to eight filters over the openings, with the M logos facing forward. Filters can be separated from the strip by twisting them at the perforations. Ensure that filters are properly aligned with vials.

OR

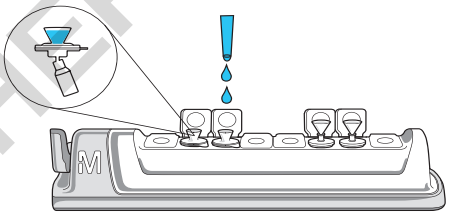
For Millex® filters, place one to eight filters over the openings, pressing down firmly to ensure proper sealing. Attach the provided funnels to the filters. Ensure that filters are properly aligned with vials.



8. For Millex Samplicity® filters, add **0.3–1.7 mL** of sample to filters. To avoid air-locking the filter, pipette the sample directly into the center of the funnel, not down the side.

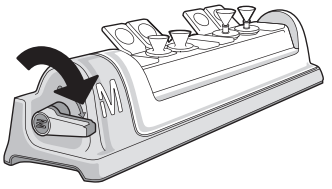
OR

For Millex® filters, add **0.4–1.7 mL** of sample to funnels, filling funnels for all samples that need to be filtered at the same time.



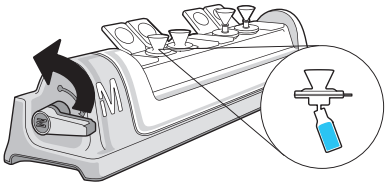
9. Turn vacuum on at the source, then rotate system handle forward. Vacuum will pull samples through the filters and into the vials.

   NOTE: Light downward pressure on the lid may be required to initiate vacuum.



10. When all filters are empty, rotate the system handle up and wait for the vacuum pressure to release through the bleeder orifice (approximately 10 seconds). Remove filters and discard, then remove lid to access sample vials.

    NOTE: To avoid sample spray/cross-contamination, do not remove filters or lid, or open doors before vacuum has released.



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Troubleshooting

Symptom	Cause	Corrective Action
Sample does not filter	Inadequate vacuum	Make sure tubing connection between system and vacuum source is secure and leak-free.
		If using a flask trap, make sure it is empty and that the in-line Millex®-FA_{50} filter has not gotten wet.
		Make sure that the lid is properly aligned with the base. To ensure sealing, gently push down on the lid after the applying vacuum.
		Make sure Millex Samplicity® filters are seated correctly with the M logo facing forward.
		Make sure Millex® filters are properly inserted into filter sealing grommets. Push filters gently into grommets to ensure that they lie flat.
		Make sure vial tray and lid are seated correctly.
		Make sure doors on any empty ports are closed.
		Make sure vacuum source is on and system handle is in the "ON" position.
		Make sure system gaskets and door gaskets are clean and undamaged.
	Air-locked filter	Pipette sample directly into center of filter, not down the side. To dislodge trapped air bubbles, resuspend sample by gently pipetting up and down.
Slow filtration	Insufficient vacuum	Increase vacuum pressure.
	Sample viscosity or particulate load too high	Dilute or prefilter sample.
	Reuse of filter	Filters are single use. Do not reuse.
Sample spray/sample cross contamination	Incorrect release of vacuum	Rotate system handle up and wait for vacuum to release before removing filters or lid, or opening doors.
	Reuse of filter	Filters are single use. Do not reuse.
Vacuum does not release	Bleeder orifice is clogged	Contact Technical Service.

Storage

Store the Samplicity® G2 Filtration System, Millex Samplicity® filters, and Millex® filters at room temperature in a dry environment. The system lid should be stored on the base in order to maintain the correct shape.

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Cleaning and Maintenance

The Samplicity® G2 Filtration System must be kept clean in order to function properly. To prevent buildup of contaminants, clean up spills and sample residue promptly. If liquid spills in the system, remove the vial tray, clean the system, then apply vacuum pressure for 30 seconds. Clean components as follows:

Lid, doors, and vial tray:	Hand wash with mild soap solution, followed by rinse in deionized water; or wipe down with deionized water, 10% bleach, 70% ethyl alcohol, or 100% methyl alcohol. Do not use abrasive cleaning agents. Wipe components dry with a soft, lint-free cloth.
Base:	Wipe down with mild soap solution, then wipe with deionized water; or wipe down with deionized water, 10% bleach, 70% ethyl alcohol, or 100% methyl alcohol. Wipe dry with a soft, lint-free cloth.

NOTE: Samplicity® G2 Filtration System components should not be cleaned in a dishwasher or autoclaved.

Specifications

Samplicity® G2 Filtration System

Performance	
Vacuum pressure recommended	610–847 mbar (18–25 in. Hg) at 30 L/min
Dimensions	
Length	44.5 cm (17.5 in.)
Width	10.2 cm (4.0 in.)
Height	9.1 cm (3.6 in.)
Weight (approximate)	1.3 kg (2.9 lb)
Tubing	6.4 mm ID × 0.9 m (1/4 in. ID × 36 in.)
Waste tray well capacity	5 mL
Materials of Construction	
Base	Polypropylene, silicone, stainless steel
Waste tray	Recycled polyester (PET)
Vial tray	Polypropylene, thermoplastic elastomer (TPE)
Lid/doors/seals	Engineering copolymer, TPE
Filter sealing grommet	Thermoplastic vulcanizate (TPV)
Internal components	Polypropylene, Tygon® tubing, polyvinyl chloride (PVC), acetal, Buna-N
Vacuum tubing and connector	Tubing: silicone Connector: acetal, Buna-N, stainless steel

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Specifications, continued

Millex Samplicity® Filter

Dimensions (strip of 4 filters)	
Length	14.5 cm (5.7 in.)
Width	4.3 cm (1.7 in.)
Height	3.0 cm (1.2 in.)
Weight	22.7 g (0.8 oz)
Sample volume	0.3–1.7 mL
Materials of Construction	
Housing	High density polyethylene (HDPE), TPE, high impact polystyrene/polyester (HIPS/PET)
Membrane	0.20 µm hydrophilic PTFE 0.45 µm hydrophilic PTFE 0.45 µm hydrophilic PVDF
HPLC Certification (PTFE filters only)	Millex Samplicity® PTFE filters are tested for UV-absorbing extractables. One-milliliter samples of acetonitrile (0.20 and 0.45 µm filters) and water (0.45 µm filter) are collected after discarding the first 1 mL of solvent. HPLC analysis shows no peaks greater in intensity than 0.004 AUFS (after column frontal volume) at either 214 or 254 nm.

Millex® Filters for the Samplicity® G2 Filtration System

Dimensions	Millex® filter	Funnel
Length	26 mm (1.02 in.)	23.4 mm (0.92 in.)
Diameter	33 mm (1.30 in.)	22.4 mm (0.88 in.) opening Luer-slip outlet
Filtration surface area	4.5 cm^2 (0.7 $in.^2$)	N/A
Weight	3.7 g (0.13 oz)	0.5 g (0.02 oz)
Sample volume	0.4–1.7 mL	N/A

Materials of Construction	
Membrane	
GV, HV	Hydrophilic Durapore® PVDF
GP, HP	Hydrophilic Millipore Express® PLUS PES
GN, HN	Nylon
Filter housing	Polypropylene
Funnel	Polypropylene
HPLC Certification (Nylon filters only)	Millex®-GN and HN filters are tested for UV-absorbing extractables. HPLC analysis of 1 mL samples of both acetonitrile and water collected after discarding the first 1 mL of solvent showed no peaks greater in intensity than 0.004 AUFS (after column frontal volume) at either 214 or 254 nm. Representative samples of all lots manufactured are tested.

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Conformance to Pressure Equipment Directive

The Samplicity® G2 Filtration System does not fall within the scope of Pressure Equipment Directive 2014/68/EU (PED), therefore, conformance to this directive is not applicable.

Ordering Information

This section lists catalogue numbers for the Samplicity® G2 Filtration System and related products. See the Technical Assistance section for contact information. You can also purchase these products online at www.millipore.com/products.

Product Description		Cat. No.	Qty/Pk
Samplicity® G2 Filtration System			
(includes base, vial tray, lid, waste tray, tubing, and quick-start guide)	Blue	SAMP2SYSB	1
	Green	SAMP2SYSG	1
Samplicity® Filtration System Vial Trays (one blue, one green)		SAMVIALTR	2
Samplicity® Filtration System Waste Trays		SAMWASTTR	5
Samplicity® Filtration System Tube Set Assembly		SAMTUBING	1
Samplicity® G2 Filtration System Lid		SAMP2LID	1
Millex Samplicity® Filters			
0.20 µm hydrophilic PTFE filter		SAMPLG001	96
		SAMPLG004	384 (4 × 96/pk)
0.45 µm hydrophilic PTFE filter		SAMPLCR01	96
		SAMPLCR04	384 (4 × 96/pk)
0.45 µm hydrophilic PVDF filter		SAMPHV001	96
		SAMPHV004	384 (4 × 96/pk)

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Ordering Information, continued

Millex® Filters for Samplicity® G2 Filtration System (includes Millex® filter plus funnel)		
0.22 µm hydrophilic PVDF filter	SAMP2GVNB	250
	SAMP2GVNK	1000 (4 × 250/pk)
0.45 µm hydrophilic PVDF filter	SAMP2HVNB	250
	SAMP2HVNK	1000 (4 × 250/pk)
0.20 µm hydrophilic nylon filter	SAMP2GNNB	250
	SAMP2GNNK	1000 (4 × 250/pk)
0.45 µm hydrophilic nylon filter	SAMP2HNNB	250
	SAMP2HNNK	1000 (4 × 250/pk)
0.22 µm hydrophilic PES filter	SAMP2GPNB	250
	SAMP2GPNK	1000 (4 × 250/pk)
0.45 µm hydrophilic PES filter	SAMP2HPNB	250
	SAMP2HPNK	1000 (4 × 250/pk)

Samplicity® G2 Filtration System and Filter Starter Bundles

For available system and filter combinations go to www.millipore.com and enter *samplicity starter bundle* in the search box.

Accessories		
Millex®-FA_{50} filter, 1.0 µm, hydrophobic PTFE, 50 mm	SLFA05010	10
Chemical Duty Pump, 115 V (60 Hz)	WP6111560	1
Chemical Duty Pump, 100 V (50/60 Hz)	WP6110060	1
Chemical Duty Pump, 220 V (50 Hz)	WP6122050	1
High Output Pump, 115 V (60 Hz)	WP6211560	1
High Output Pump, 100 V (50/60 Hz)	WP6210060	1
High Output Pump, 220 V (50 Hz)	WP6222050	1
Vacuum Tubing, 6.4 mm ID × 3 m (1/4 in. ID × 10 ft)	MSVMHTS09	1

Technical Assistance

For more information, contact the office nearest you. In the U.S., call 1-800-221-1975. Outside the U.S., 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.

Standard Warranty

The applicable warranty for the products listed in this publication may be found at www.millipore.com/terms ("Conditions of Sale").

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