



Operation Manual

MICROPURGE® MP100

Peristaltic Pump



MP100 Peristaltic Pump

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INTRODUCTION

INTENDED USE

The QED Environmental Systems Inc, MP100 is a portable peristaltic pump designed for collecting shallow groundwater and surface water samples. It operates using a 12V power supply, making it great for field use.

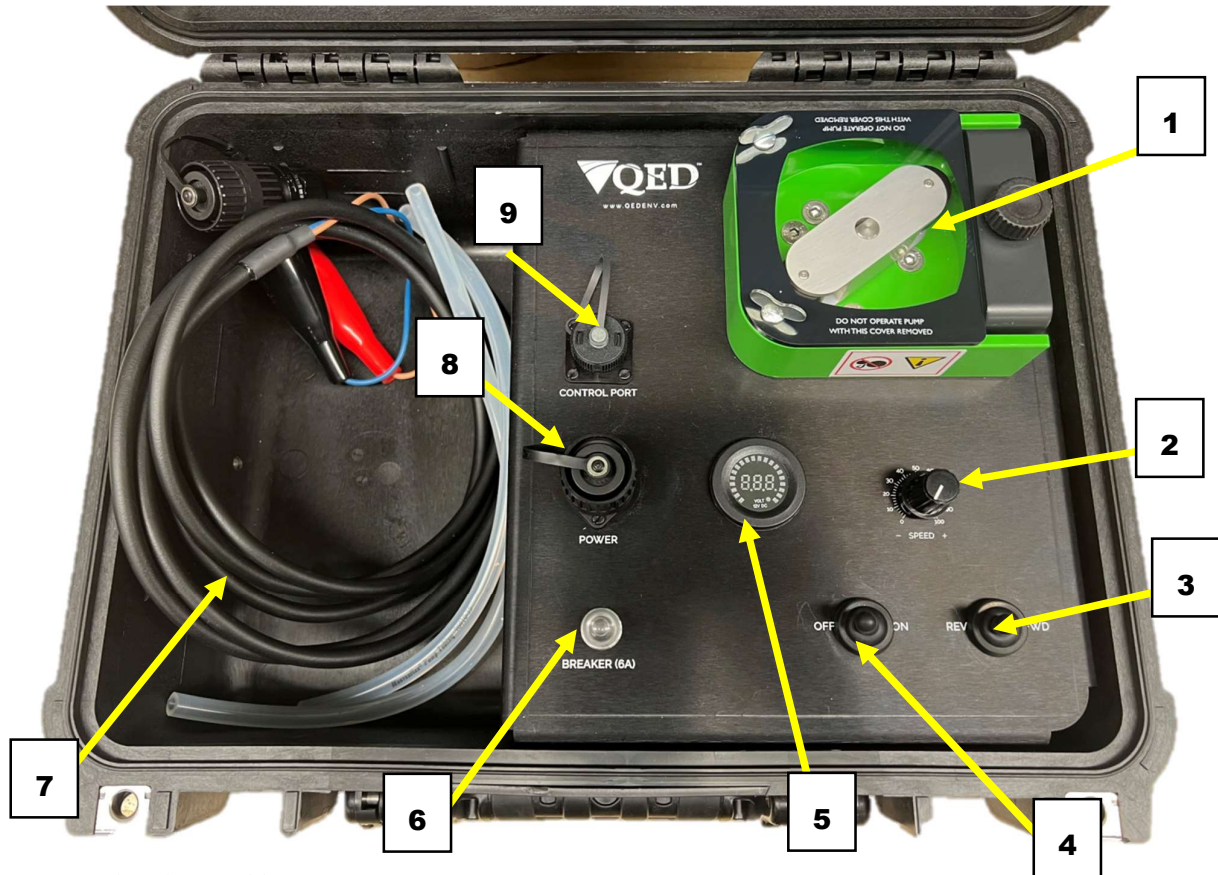
Peristaltic pumps work on the principle of peristalsis, utilizing a flexible tube and rollers at the pump head. The fluid only contacts the inside of the tube, making cleaning and maintenance easy and preventing cross-contamination. The pump's speed is adjustable for controlling flow rate, and it includes a speed direction switch for back flushing.

See the Technical Data section of this document for determining compatibility of this product with your application and contact QED for application assistance.

 WARNING	
	<p>PERSONAL PROTECTIVE EQUIPMENT</p> <p>Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to:</p> <ul style="list-style-type: none"> • Protective eyewear, and hearing protection • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer
	<p>EQUIPMENT MISUSE HAZARD</p> <p>Misuse can cause death or serious injury.</p> <ul style="list-style-type: none"> • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and disconnect power supply when equipment is not in use. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call QED Environmental for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Moving parts in motor, keep hands clear while machine is in operation • Comply with all applicable safety regulations.

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SETUP & OPERATION COMPONENTS



1. Pump head assembly
2. Speed control knob
3. Rotation direction (forward/reverse)
4. Power ON / OFF
5. Voltmeter
6. Resettable circuit breaker (6A)
7. 12V power cable
8. Power cable connector
9. Control port for MicroPurge MP30 Water Level/Drawdown meter

MicroPurge Water Level/Drawdown Meter Interface (optional)

The MicroPurge MP30 Water Level/Drawdown Meter can be used to control the peristaltic pump operation to prevent excessive water level drawdown in the well. Using the controller cable provided with the MP30 unit, attach one end of the cable to the control port on the MP30 unit and the other to the control port located on the peristaltic pump panel. When the MP30 is in Drawdown Mode, if the water level in the well drop below the

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preset depth of the probe, the MP30 unit will send a signal to the peristaltic pump to pause operation. When the water level rises above the probe depth again or the probe is lowered further, the pump will resume operation.

Replacement & Consumable Parts

Silicone Rubber Tubing:

3/16" (4.8mm) ID, equivalent to L/S 15 size Part Number: 42402

1/4" (6.4mm) ID, equivalent to L/S 24 size Part Number: 42403

5/16" (7.9mm) ID, equivalent to L/S 35 size Part Number: 42404

Pump Head Cover Part Number: 42401

Replacement Roller Assembly Part Number: 42400

Power Cord Part Number: 42370

SETUP

Tools and equipment needed: Silicone tubing, Tubing cutter, 12VDC Power Supply

1. Ensure the battery is disconnected and the power switch is in the OFF position.
2. To access the pump head, loosen cover fasteners by turning counterclockwise 1/4 turn to unlock and remove the cover, then loosen the thumbwheel on the tubing clamp.



3. Cut a piece of silicone tubing long enough to wrap around the inside of the pump head and extend over the edge of the case. The minimum length recommended is 16 inches (40.5 cm), but the silicone tubing can be as long as desired to easily connect to the drop tubing in the well.

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4. Lay cut tubing on top of the roller assembly, see picture. With the roller assembly parallel with the QED logo.



5. With the Power OFF. Rotate by hand the roller assembly in a clockwise or counterclockwise motion, while pushing the tubing down into place around the perimeter of the motor housing.



6. Install the cover and tighten the cover fasteners by turning them clockwise 1/4 turn to lock. Secure tube with the clamp and tighten thumbwheel until firmly seated.

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SYSTEM OPERATION

1. Complete the "Setup" instructions above.
2. Ensure toggle switch is turned to OFF, and the speed control knob is turned to 0.
3. Connect the drop tubing from the well to the silicone pump tubing, taking note of the direction of pump rotation. With the rotation switch in the forward (FWD) position, the rotor will turn clockwise and the intake side of the tubing will be at the bottom of the pump.
4. Connect the power cord to the connector on the panel.
5. Connect the power cord clamps to the battery or power supply terminals, taking note of the polarity; red is positive (+), black is negative (-).
6. Determine correct flow direction based on tubing setup, toggle flow direction switch to desired direction.
7. Turn power toggle switch to ON
8. Increase the speed with the dial, there will be a delay in water coming to the surface.

SYSTEM MAINTENANCE + TRANSPORT

Tubing: QED recommends the use of a silicone tubing for proper performance of the pump; use of incorrect tubing or tubing material may damage the pump head and void the warranty.

Pump System: While designed for field use, in the event that water gets on the control panel or inside the case, there are drain holes at the bottom of the case to help reduce the chances of water damage. It is recommended to stop pumping and drain water before continuing to operate the pump.

Power Supply: The recommended power source is a 12 volt battery, typically lead acid/AGM type. A power supply can be used if it meets the minimum output requirement of 12.6 volts and 3.0 amps. If the power supply drops below 10 volts, the unit will shut down.

Power Cord: Do not use any damaged or kinked power cord. Power cord replacements are available from QED Environmental.

Transport: When transporting the MP100 Peristaltic Pump, ensure that both latches are fully secured and seated on the case. While the MP100 design is rugged, avoid dropping the case or tossing it into your vehicle.

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TECHNICAL SPECIFICATIONS

Maximum water depth below ground surface: Up to 30 ft of lift (at sea level)

Overall Case Dimensions: 16.44 x 13.00 x 6.82 in

Power Source: 12 VDC

Operating Current: 2 Amps

Overcurrent Protection: 6 Amps

Weight: 13.5 lbs

APPROXIMATE FLOW RATES

Pump Tubing Dimensions (inches) & L/S size	Pump Tubing Dimensions & Wall Thickness (mm)	RPM	Maximum Lift (feet)	Maximum Flow LPM	Maximum Flow GPM	Recommended Drop Tubing Size
0.375" OD x 0.190" ID (L/S 15)	4.8 ID x 9.6 OD, 2.4 WT	240	30'	0.7	0.18	1/4" OD (6.4mm)
0.440" OD x 0.250" ID (L/S 24)	6.4 ID x 11.2 OD, 2.4 WT	240	30'	1.1	0.30	5/16" OD (8.0mm)
0.500" OD x 0.310" ID (L/S 35)	7.9 ID x 12.7 OD, 2.4 WT	240	29'	1.5	0.39	3/8" OD (9.6mm)

*maximum flow rates may vary depending on motor speed, tubing size and pumping conditions

APPROXIMATE BATTERY DISCHARGE RATE

Battery Capacity (AH)	Pump Tubing Dimensions (inches) & L/S size	Time Pumped (min)	Liters Pumped	Gallons Pumped
5	0.375" OD x 0.190" ID (L/S 15)	360	41	11
12		864	102	27
33		2376	283	75
5	0.440" OD x 0.250" ID (L/S 24)	300	34	9
12		720	87	23
33		1980	238	63
5	0.500" OD x 0.310" ID (L/S 35)	225	177	47
12		540	64	17
33		1488	26	47

*Discharge rates may vary depending on motor speed, tubing size and pumping conditions

CLEANING + REPAIR

Clean the interior of the MP100 periodically, with a phosphate-free cleaning agent (Simple Green, Dawn Liquid Soap, Etc). When cleaning ensure that power has been turned off to the unit. Turn the toggle switch to off and remove any connections to the power source. **DO NOT REMOVE CONTROL PANEL OR SCREWS ON THE EXTERIOR OF THE CASE.**

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PATENT INFORMATION

The equipment in this manual is protected under U.S. and foreign patents issued and pending. For a complete list of patents visit www.graco.com/patents.

The equipment in this manual is protected under Registered Trademarks. For a complete list of Registered Trademarks and Trademarks, visit www.graco.com/trademarks.

WARRANTY INFORMATION

Q.E.D. ENVIRONMENTAL SYSTEMS, INC. ("QED") warrants to the original purchaser ("Purchaser") of its groundwater sampling products ("Products") that the products shall be free of defects in materials and workmanship on the date of sale, subject to the limitations below. Any failure of the products to conform to this warranty will be remedied by QED in the manner provided herein.

This warranty shall be limited to the duration and the conditions set forth below. Warranty duration is calculated from the original date of purchase.

1. Dedicated-Use System Products – Ten (10) year warranty on dedicated bladder pumps with PTFE (Teflon®) bladders equipped with original equipment inlet screens and used in periodic, non-continuous groundwater sampling (up to 52 samples events per year.) Five (5) year warranty on dedicated bladder pumps using Teflon-free proprietary polymer bladders. All other components, equipment and accessories are warranted for one (1) year except as stated below.
2. Portable Systems and Controls - Sample Pro portable-use pumps, MicroPurge Controllers, Peristaltic Pumps and Water Level and Drawdown Meters are warranted for one (1) year. Hose reel and caps are warranted for ninety (90) days. Tubing used in a Portable System is covered by a ninety (90) day material and workmanship warranty. There will be no warranty for application on tubing when used as part of a Portable System.
3. Separately Sold Parts, Spare Parts Kits and Repairs - Separately sold parts and spare parts kits are warranted for ninety (90) days. Repairs performed by QED are warranted for ninety (90) days from date of repair or for the remaining term of the original warranty, whichever is longer.
4. Flow Cell Systems – The Sonde, OEM Handheld Display and Sensors are warranted for three years from date of purchase. Aftermarket handheld displays (e.g., ruggedized tablet devices) are covered by the aftermarket device standard limited warranty. This warranty does not apply to batteries of any type or any other items that carry shelf lives (i.e. calibration solutions). Also the warranty does not cover products damaged by improper installation, or application, misuse, abuse, neglect or accident. NOTE: THE FLOW CELL SYSTEMS WARRANTY EXCLUDES COVERAGE OF COMPONENTS CONSUMED THROUGH NORMAL USE, SUCH AS REPLACEMENT OF REFERENCE ELECTRODE JUNCTION OR SOLUTION.

Purchaser's exclusive remedy for breach of said warranty shall be as follows:

If Purchaser notifies QED in writing within the applicable warranty period of a claimed defect in the Product and QED determines after inspecting the Product that the defect is covered by the warranty, QED will repair the Product without charge to Purchaser. If QED for any reason cannot repair a Product determined by QED to be covered by this warranty within four (4) weeks after receipt of the defective Product, then QED's sole responsibility shall be, at its option, either to replace the defective Product with a comparable new unit at no charge to Purchaser or to refund the purchase price paid by Purchaser. QED's obligation to repair, replace or refund are conditioned upon the Purchaser's return of the claimed defective Product to QED, after receiving authorization to do so from QED. In no event shall claimed defective Products be returned to QED without its authorization. If the Product is determined not to be defective within the terms of this warranty, then all costs for repair, parts and labor that are authorized by Purchaser shall be borne by Purchaser.

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THE FOREGOING WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY (INCLUDING BUT NOT LIMITED TO THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE), WHICH OTHER WARRANTIES ARE EXPRESSLY EXCLUDED HEREBY. QED neither assumes, nor authorizes any person to assume for it, any other obligation or liability in connection with the Products. Purchaser agrees that in no event will QED be liable for incidental, consequential or special damages (including but not limited to lost profits, lost sales, or injury to persons or property) and that Purchaser's sole remedy is the above warranty.

This warranty will be void in the event of unauthorized disassembly of component assemblies. This warranty will also be void if the defect in a Product results from abuse; operating, installing or maintaining the Product in a manner other than in accordance with QED's written recommendations; uses or applications other than the intended use or application, as indicated in the manual; or exposure to chemical or physical environment beyond the designated limits of materials and construction. This warranty does not cover, and QED shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, substitution of non-QED component parts, or the selection of improper material or product configuration for Purchaser's application. Nor shall QED be liable for malfunction, damage or wear caused by the incompatibility of QED equipment with structures, accessories, equipment or materials not supplied by QED, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by QED. QED shall be released from all obligations under all warranties if any Product covered hereby is repaired or modified by persons other than QED's service personnel unless such repair by others is made with the written consent of QED.

RESPONSIBILITY OF THE PURCHASER

Purchaser is responsible for notifying QED of the defect, malfunction, or other manner in which the terms of this warranty are believed to be breached. In the event of a warranty claim, Purchaser must contact the Customer Service Department of QED and:

1. Identify the product involved (by model or serial number or other sufficient description that will allow QED to determine which product is claimed defective);
2. Specify where, when, and from whom the Product was purchased;
3. Describe the nature of the defect or malfunction; and
4. Send the malfunctioning component, after authorization by QED, to:

QED Environmental Systems, Inc.

2355 Bishop Circle West

Dexter, MI 48130

Toll Free North America: (800) 624-2026

Company Main: (734) 995-2547

Fax: (734) 995-1170

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