

WELCH-ILMVAC

OWNER'S MANUAL
FOR
PERISTALTIC PUMP SYSTEMS
MODELS:
3100
3200



Model 3100



Model 3200



WARNING

Welch's peristaltic pump models 3100 and 3200 are not designed for medical or dental use. Model 3100 and 3200 pump have not been submitted for FDA approval.

For outside of U.S. and Canada, contact your local Gardner Denver sales office

Welch-Ilmvac
5621 W. Howard Street
Niles, IL 60714
Phone: (847) 676-8800 (Technical Support)
Fax: (847) 677-8606
E-Mail: gdwelchvacuum@gardnerdenver.com
Website: www.welchvacuum.com

Part No. 642881
Printed in USA

INSTRUCTION
WARNING AND CAUTION
PLEASE READ BEFORE OPERATION

While reading your manual, please pay close attention to areas labeled:
WARNING AND CAUTION.

The description of each is found below.

WARNING

Warnings are given where failure to observe instruction could result in injury or death to people.

CAUTION

Cautions are found where failure to observe the instruction could result in damage to the equipment, associated equipment and process.

These units conform to the SI International system of units of measurement.

The following symbols (with recommendation of IEC1010) of warning will be found on the pump.



Caution - Refer to accompanying documents



Caution - Risk of electrical shock



Caution - Hot surface



Caution - Hand/finger pinch

WARNING

Motor includes a self resetting thermal cutout and the pump could restart without actuation under fault condition.

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- 1.00 Getting Started
- 1.01 Read and understand the following information and instructions included with your Welch Peristaltic Pump before using. This information is for your safety and to prevent damage to the pump.
- 1.10 Caution: To Prevent Injury...
- 1.11 Never operate this product if it has a damaged cord or plug. If it is not working properly, has been dropped, damaged or has fallen in water, please return the product to a Welch service center for examination and repair (847-676-8800) or visit our website at www.welchvacuum.com for more information.
- 1.12 Keep the cord away from heated surfaces. All electrical products generate heat. To avoid serious burns never touch unit during or immediately after operation.
- 1.13 Do not operate this product where oxygen is being administered.
- 1.14 This pump is thermally protected and can automatically restart when the protector resets. Always disconnect power source before servicing.
- 1.15 Wear safety glasses and goggles when operating this product.
- 1.16 Never block any air openings or place it on a soft surface where the openings may be blocked. The air openings are for ventilation of the motor inside the housing. Keep all air openings free of lint, dirt and other foreign objects.
- 1.17 Never drop or insert fingers or any other object into any openings.
- 1.20 Caution: To reduce risk of electrical shock...
- 1.21 Do not disassemble. Disassembly or attempted repairs if accomplished incorrectly can create electrical shock hazard. Refer servicing to qualified service agencies only.
- 1.22 Unit is supplied with a three-pronged plug. Be sure to connect pump to a properly grounded outlet only.
- 1.30 Warning: To reduce risk of electrocution...
- 1.31 Do not use this product in or near an area where it can fall or be pulled into water or other liquids.
- 1.32 Do not reach for this product if it has fallen in to liquid. Unplug immediately.
- 1.33 Use indoors only.
- 1.40 Danger: To reduce risk of explosion or fire...
- 1.41 Do not use this pump in or near explosive atmospheres where aerosol (spray) products are being used.
- 1.42 Do not pump anything other than liquids with this product or use in or near areas where flammable or explosive liquids or vapors may exist.
- 1.43 Do not use this product near flames.



WARNING
Failure to observe the above safety precautions could result in severe bodily injury, including death in extreme cases.

Section 2: INSTALLATION

2.00 Introduction

This manual has been compiled not only for the care and maintenance of Welch's Peristaltic pump now in your possession, but as a helpful reference and guide to prevent many problems which can occur if used improperly.

2.10 Unpacking

Carefully remove the pump from the shipping case. Preserve all paperwork for future reference. If damage has occurred from shipment a claim must be filed with the carrier immediately. Preserve the shipping carton for inspection by the carrier. If you are required to communicate with your dealer or Gardner Denver Welch Vacuum Technology, Inc. be sure to include your order numbers for quick identification. Do not return the pump to the factory without first calling for a returned goods number.

2.20 Pump Installation

Rubber feet are attached to the pump. Rubber feet are excellent for applications involving a semi-flexible surface such as a bench top; they help to isolate noise and eliminate creeping. The peristaltic pump should be mounted in a horizontal plane. Pump is intended for intermittent duty - 8 hrs/day. (See section 4 for additional operation information).

2.30 Pump Stacking

The Welch Peristaltic Pump can be stacked by placing one unit on top of the other (not to exceed 3 units).

2.40 Pump Location

The Peristaltic Pump should be located preferably in a clean and dry area. The pump should be placed where the surrounding temperature remains between 10°C and 40°C (50°F and 104°F). Always check to insure the location choice is protected from direct or indirect moisture contact.

2.50 Pump Environmental Conditions

The Peristaltic Pump is rated for indoor use only. Operating temperature range 5°C to 40°C. Maximum relative humidity of 80% for temperatures up to 31°C decreasing to 50% at 40°C. Rated for +/-10% of supply voltage. Pollution Degree 2, Installation Category II. Altitude, up to 2,000 meters.



WARNING

Do not operate this pump in an atmosphere containing flammable or explosive gases or vapors.

2.60 Electrical Power

2.61 Power source review

The peristaltic pump models are equipped with an auto ranging switching power supply used with most electrical power systems (90V to 230V 50/60Hz) around the world. The cord set supplied with your pump will determine the pump's voltage.

There is also a fuse located inside the IEC connector (line cord connector) located on the rear of the unit. If this fuse is blown, remove the cord from the pump and replace the fuse.

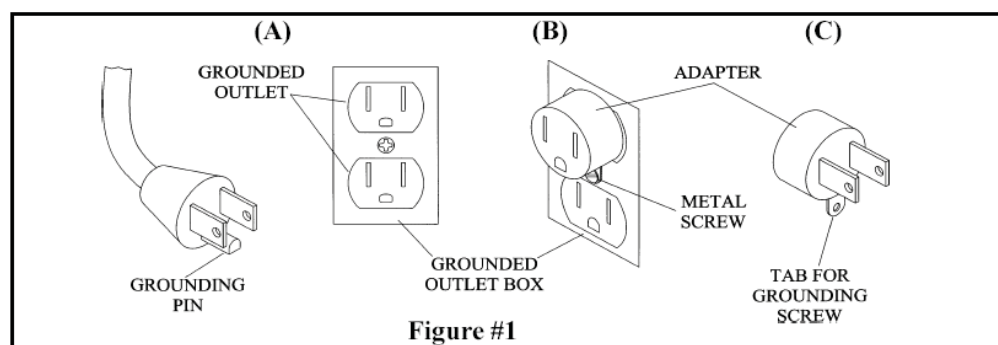
2.62 Grounding Instructions

This product should be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with a grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it will not fit the outlet, have the proper outlet installed by a qualified electrician.

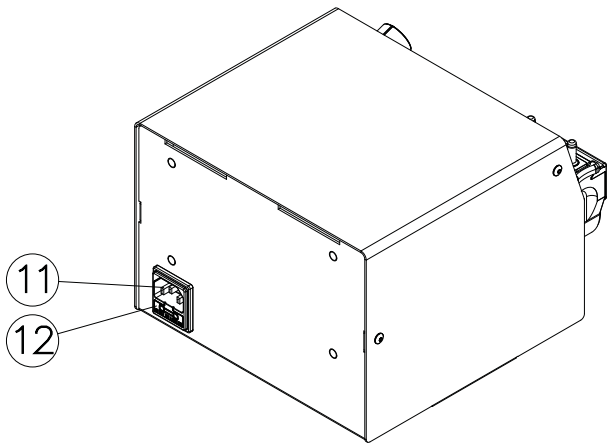
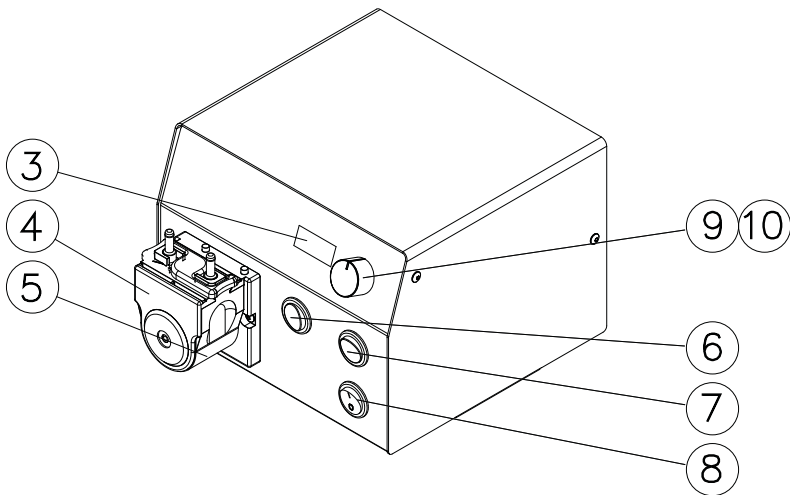
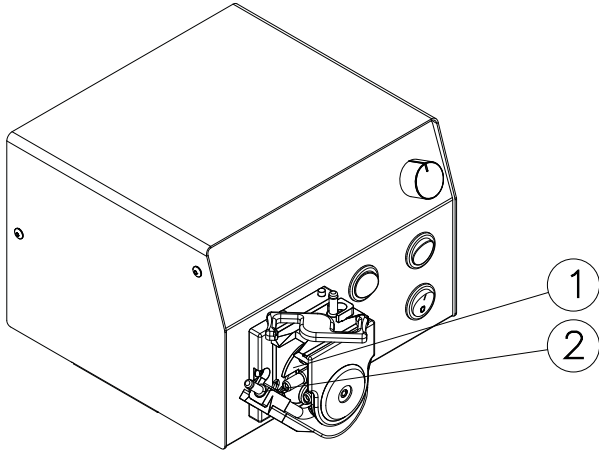
The models 3100B-01 and 3200B-01 are for use on a nominal 120V circuit, and has a grounding plug that looks like the plug illustrated in Sketch A of Figure #1. A temporary adapter, which looks like the adapter illustrated in sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet (Sketch A) can be installed by a qualified electrician. The green colored rigid ear, lug, etc. extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover. Whenever the adapter is used, it must be held in place by a metal screw.



The adapter shown in Figure B and Figure C is not acceptable in Canada.

2.63 Extension Cords If necessary to use an extension cord, use a 3-wire extension cord that has a 3-blade grounding plug, and a 3-slot receptacle that will accept the plug on the product. Make certain your extension cord is in good condition. Make certain your extension cord wire size is not less than 18 gauge for 25 feet, 16 gauge for 50 feet, and 14 gauge for 100 feet. An under sized cord will cause a drop in line voltage resulting in loss of power and overheating. If in doubt, use the next heavier cord. The smaller the gauge number, the heavier the cord.

Section 3: KEY FEATURES



1	Roller
2	Cartridge
3	LED Display (Model 3200 only)
4	Head
5	Band
6	Directional Switch (Model 3200 only)
7	Max RPM Switch
8	On/Off Switch
9	Flow Control Potentiometer
10	Bidirectional Switch (Model 3100 only)
11	IEC Connector (Voltages)
12	Fuse

Section 4: OPERATION

4.00 OPERATION INTRODUCTION

The Welch peristaltic pump head utilizes a unique Lok-n-Flow cartridge tubing design that makes changing tubing as easy as 1, 2, 3. The cartridge assembly design allows you to replace tubing in a matter of seconds.

1. Simply open the tubing lock, remove the cartridge,
2. Insert a new cartridge,
3. And close the tubing lock. No special tools or threading required.

The unique design of the Welch Peristaltic pumps has made changing tubing a snap. The illustrations in section 4.20 shows how simple and time efficient this process is. A complete line of the high precision Lok-n-Flow cartridge assemblies are available from Welch (Section 6.2 Accessories or visit: www.welchvacuum.com) .



WARNING

Wear protective gloves and goggles when changing tubing cartridges. Tubing may contain hazardous materials that can be splashed.

4.10 PLEASE DISPOSE TUBING ASSEMBLES PROPERLY

The tubing cartridges available from Welch (Section 6.2 Accessories) have revolutionized the way peristaltic pumps use tubing. The days of using calibrated tubing in areas where it is not needed are over. Welch has put the expensive tubing where it is most necessary, in the head of the pump. This unique approach allows you to use less expensive chemically compatible non-calibrated tubing for those long stretches from the pump to the application and back. Now when the tubing in the head is worn out, just replace the cartridge and reuse the rest.

4.20 STARTING A WELCH PERISTALTIC PUMP

Before operating the peristaltic pump it is well to familiarize yourself with the function and action of the peristaltic pump that you have acquired. Review the Key Features as described in Section 3.0.



CAUTION

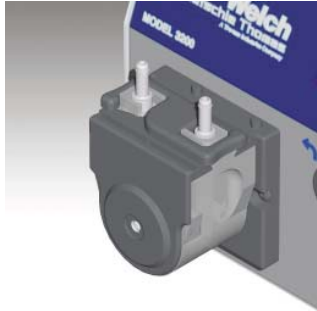
The operation of this instrument is advised that if the equipment used in a manner not specified in this manual, the protection provided by the equipment may be impaired.



CAUTION

Disconnect the power before tubing cartridge change. Moving parts can cause pinched fingers. The equipment may be impaired.

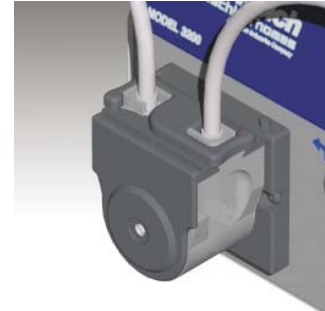
4.30 CHANGING TUBING AS EASY AS 1, 2, 3



Step 1, Disconnect application head, tubing from pump.



Step 2, Remove tubing cartridge from head and replace.



Step 3, Snap tubing into attach tubing and operate.

4.40 FLOW CONTROL

The Welch Peristaltic pump uses a bidirectional flow control potentiometer, Model 3100 and Switch Model 3200, to control the flow of liquid passing through the pump. The flow control on Model 3100 has three setting; flow left, no flow, and flow right. The farther you turn the knob the greater the flow. The center setting, no flow, does not turn the unit off.

4.50 MAX FLOW

The max flow Switch increases the flow to the maximum RPMs when pushed. Once released the flow will return to its original setting.

4.60 DIGITAL DISPLAY (MODEL 3200 ONLY)

The top right corner of the pump is a digital display that indicates the actual Revolutions per Minute (RPM) of the roller as it impacts the tubing. This Key feature allows the user to maintain reproducibility from one trial to the next.

4.70 CLEANLINESS

Take every precaution to prevent foreign particulate and harsh solutions from accumulating on the pump. Particulates can damage the pump's performance. The simplest way to extend the life of your pump is to keep it clean. Peristaltic pumps are designed to deal with various harsh and messy solutions. Unfortunately some of these solutions can spill onto the pump head and cause damage. To insure against premature pump failure clean your pump after each use.

4.80 SHUTDOWN PROCEDURES

After use, Welch recommends removing the tubing from the solution and pumping the tubing dry. This will help to eliminate any possible spills that may occur from solutions left in the tubing. Once all of the solution has been removed, set flow control knob to no flow, turn the pump off, disconnect tubing from the pump, and remove cartridge from pump head.

Section 5: MAINTENANCE AND CLEANING

Welch's Peristaltic Pump is virtually maintenance free. Besides from keeping the pump clean and replacing the tubing cartridge, Welch's Peristaltic pump requires no scheduled maintenance. No maintenance is necessary for the bearings. All bearings are sealed and permanently lubricated. Lubrication should not be attempted.

Section 6: PARTS AND ACCESSORIES

6.10 REPLACEMENT PARTS

The Welch Peristaltic pump is designed for a long service life. Throughout the service life various parts may get lost or even wear out. The following is a list of replacement parts for your Welch Peristaltic pump.

Description	Welch	VWR
Pump Head Replacement Kit	3200K-02	12000-636
Replacement Lock	3200K-03	12000-638
Replacement Band	3200K-04	12000-640









6.20 REPLACEMENT PARTS

Welch's peristaltic pump accessories are designed to give you all the necessary equipment support needed to operate and use your pump. The following is a brief list of the accessories available. A complete list of pump accessories is available online at www.welchvacuum.com or by calling (847) 676-8819.

6.30 QUICK DISCONNECT FITTINGS

	Description	Welch Kit	VWR Cat. No.
	1/16" Female Quick Disconnect fittings	3652K-01	84009-650
	1/8" Female Quick Disconnect fittings	3652K-02	84009-652
	3/16" Female Quick Disconnect fittings	3652K-03	84009-654
	1/16" Male Quick Disconnect fittings	3652K-04	84009-656
	1/8" Male Quick Disconnect fittings	3652K-05	84009-658
	3/16" Male Quick Disconnect fittings	3652K-06	84009-660
	1/16" Male Swivel Quick Disconnect fittings	3652K-07	84009-662
	1/8" Male Swivel Quick Disconnect fittings	3652K-08	84009-664
	3/16" Male Swivel Quick Disconnect fittings	3652K-09	84009-666
	1/16" Locking Male Quick Disconnect fittings	3652K-10	84009-668
	1/8" Locking Male Quick Disconnect fittings	3652K-11	84009-670
	3/16" Locking Male Quick Disconnect fittings	3652K-12	84009-672
	1/16" Lock Male Swivel Quick Disconnect	3652K-13	84009-674
	1/8" Lock Male Swivel Quick Disconnect	3652K-14	84009-676
	3/16" Lock Male Swivel Quick Disconnect	3652K-15	84009-678
	Female - Female Shut-Off Quick Disconnect	3652K-16	84009-680
	Female - Male Shut-Off Quick Disconnect	3652K-17	84009-682
	1/16" Female Shut-Off Quick Disconnect	3652K-18	84009-684
	1/8" Female Shut-Off Quick Disconnect	3652K-19	84009-686
	3/16" Female Shut-Off Quick Disconnect	3652K-20	84009-688
	1/16" Male Shut-Off Quick Disconnect	3652K-21	84009-690
	1/8" Male Shut-Off Quick Disconnect	3652K-22	84009-692
	3/16" Male Shut-Off Quick Disconnect	3652K-23	84009-694

6.40 BARBED FITTINGS

	Description	Welch Kit		VWR Cat. No.	
		Kynar®	HDPE	Kynar®	HDPE
	1/16" Equal Leg Coupler	3550K-01	3551K-01	84009-612	84009-574
	1/8" Equal Leg Coupler	3550K-02	3551K-02	84009-614	84009-576
	3/16" Equal Leg Coupler	3550K-03	3551K-03	84009-616	84009-578
	1/8"-1/16" Reduction Couplers	3550K-04	3551K-04	84009-618	84009-580
	1/16"-1/8" Reduction Couplers	3550K-05	3551K-05	84009-620	84009-582
	1/4"-3/16" Reduction Couplers	3550K-06	3551K-06	84009-622	84009-584
	1/16" Crosses	3550K-07	3551K-07	84009-624	84009-586
	1/8" Crosses	3550K-08	3551K-08	84009-626	84009-588
	1/16" Equal Barb Elbows	3550K-09	3551K-09	84009-628	84009-590
	1/8" Equal Barb Elbows	3550K-10	3551K-10	84009-630	84009-592
	3/16" Equal Barb Elbows	3550K-11	3551K-11	84009-632	84009-594
	1/16" Equal Barb Tees	3550K-12	3551K-12	84009-634	84009-596
	1/8" Equal Barb Tees	3550K-13	3551K-13	84009-636	84009-598
	3/16" Equal Barb Tees	3550K-14	3551K-14	84009-638	84009-600
	1/8"-1/16" Reduction Barb Tees	3550K-15	3551K-15	84009-640	84009-602
	1/8"-1/16" Reduction Elbows	3550K-16	3551K-16	84009-642	84009-604
	1/8" Y-Connectors	3550K-17	3551K-17	84009-644	84009-606
	3/16" Y-Connectors	3550K-18	3551K-18	84009-646	84009-608

6.50 TUBE AND TUBE CUTTERS

	Description	Welch Kit	VWR Cat. No.
	6.51 Large Tube Cutter, 1 inch O.D. Capacity Cutter Replacement Blades	3103K-03 3103K-04	84009-570 84009-572
	6.52 Small Tube Cutter, 1/2 inch O.D. Capacity Cutter Replacement Blades	3103K-01 3103K-02	84009-566 84009-568
	6.60 On/Off Hand Free Control Foot Switch	1430A	14233-684
	6.70 Cartridges / Hose Assemblies		
	6.71 Silicon 1.6 mm 5 Cartridge Assemblies 3.2 mm 5 Cartridge Assemblies 4.8 mm 5 Cartridge Assemblies	3432K-01 3432K-02 3432K-04	84009-524 84009-526 84009-528
	6.72 Santoprene 1.6 mm 5 Cartridge Assemblies 3.2 mm 5 Cartridge Assemblies 4.8 mm 5 Cartridge Assemblies	3433K-01 3433K-02 3433K-04	84009-530 84009-532 84009-534
	6.73 PVC 1.6 mm 5 Cartridge Assemblies 3.2 mm 5 Cartridge Assemblies 4.8 mm 5 Cartridge Assemblies	3434K-01 3434K-02 3434K-04	84009-536 84009-538 84009-540
	6.74 Fluoroelastomer ® 1.6 mm 5 Cartridge Assemblies 3.2 mm 5 Cartridge Assemblies 4.8 mm 5 Cartridge Assemblies	3435K-01 3435K-02 3435K-04	12000-642 12000-644 12000-646

	Description	Welch Kit	VWR Cat. No.
	6.75 Clamps Single Snap-Grip Clamps (20/pk)	3101K-01	84009-562
	6.76 Tubing / Hose Silicone / PVC, 25 Ft. Genarel PVC Tubing (4.8mm) Two of each; 1.6mm, 3.2mm, and 4.8mm Silicon Cartridge Assemblies	3200K-01	84009-704
	10 Ft. of 1.6mm Hose (Silicone)	3232K-01	84009-544
	10 Ft. of 3.2mm Hose (Silicone)	3232K-02	84009-546
	10 Ft. of 4.8mm Hose (Silicone)	3232K-04	84009-548
	10 Ft. of 1.6mm Hose (Santoprene)	3233K-01	84009-550
	10 Ft. of 3.2mm Hose (Santoprene)	3233K-02	84009-552
	10 Ft. of 4.8mm Hose (Santoprene)	3233K-04	84009-554
	10 Ft. of 1.6mm Hose (PVC)	3234K-01	84009-556
	10 Ft. of 3.2mm Hose (PVC)	3234K-02	84009-558
	10 Ft. of 4.8mm Hose (PVC)	3234K-04	84009-560
	10 Ft. of 1.6mm Hose (Fluoroelastomer ®)	3235K-01	12000-648
	10 Ft. of 3.2mm Hose (Fluoroelastomer ®)	3235K-02	12000-650
	10 Ft. of 4.8mm Hose (Fluoroelastomer ®)	3235K-04	12000-652
	6.80 Fitting Kits 6.81 Small Barbed Fitting Kit Small Barbed Fitting Kit - Kynar ®	3550K-90	84009-648
	Small Barbed Fitting Kit - HDPE	3551K-90	84009-610
	6.82 Quick Disconnect Fitting Kit Quick Disconnect Fitting Kit	3652K-90	12000-654

Condition	Probable Cause	Recommended Action
Pump not working	Power Off	Check all power connection and turn on power.
	Blown Fuse	Check fuse in IEC connection, replace fuse.
	Roller Pinched	Unplug unit and remove tubing. Restart without tubing.
No Display	Power interrupted	Restart Unit.
Leaks	Tubing Cartridge worn out	Replace Cartridge.
	Tubing incompatible with product	Check Chemical Compatibility chart at www.welchvacuum.com
	Loose tubing clamp	Check all tubing clamps and secure.
Head Stalled	Head Dirty	Clean head with mild soap solution.
	Roller Pinched	Unplug unit and remove tubing. Restart without tubing.

Section 8: SPECIFICATION

8.10 SPECIFICATION TABLE



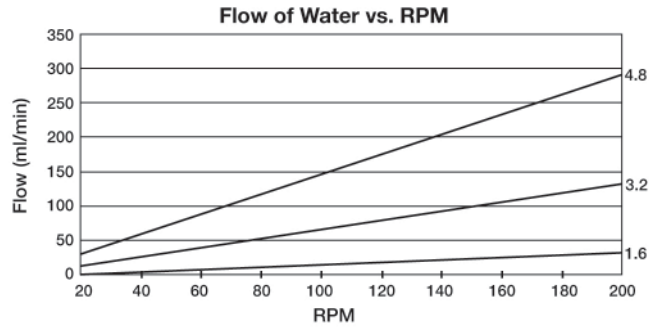
Model No.	3100		3200	
Flow Range	3-300 mL/min	3-300 mL/min	3-300 mL/min	3-300 mL/min
RPM	20-200	20-200	20-200	20-200
Speed Control	Bidirectional +/- 2%	Bidirectional +/- 2%	Bidirectional +/- 2%	Bidirectional +/- 2%
Max Button	Yes	Yes	Yes	Yes
Pump Head	Welch Lok-n-Flow easy-change cartridge design	Welch Lok-n-Flow easy-change cartridge design	Welch Lok-n-Flow easy-change cartridge design	Welch Lok-n-Flow easy-change cartridge design
Motor	Reversible	-	-	-
Weight, Lb (Kg)	6 (2.7)	6 (2.7)	6 (2.7)	6 (2.7)
Overall Dimensions	-	-	-	-
L in. (cm)	7 (17.8)	7 (17.8)	7 (17.8)	7 (17.8)
W in. (cm)	7.5 (19)	7.5 (19)	7.5 (19)	7.5 (19)
H in. (cm)	5.5 (14)	5.5 (14)	5.5 (14)	5.5 (14)
Shipping Weight, Lb (Kg)	10 (4.5)	10 (4.5)	10 (4.5)	10 (4.5)
Shipping Carton Dimension LxWxH in. (cm)	9 x 12 x 12 (30 x 31 x 31)	9 x 12 x 12 (30 x 31 x 31)	9 x 12 x 12 (30 x 31 x 31)	9 x 12 x 12 (30 x 31 x 31)
Electrical Ratings (AC)	100-230V 50/60Hz 0.30/0.15A	100-230V 50/60Hz 0.30/0.15A	100-230V 50/60Hz 0.30/0.15A	100-230V 50/60Hz 0.30/0.15A
Fuse Ratings	T0.63A/250V	T0.63A/250V	T0.63A/250V	T0.63A/250V
Wiring	Wired for 115V 60Hz with N. American 115V plug.	Wired for 230V 50Hz with Europe (Shuko) Plug	Wired for 115V 60Hz with N. American 115V Plug	Wired for 230V 50Hz with Europe (Shuko) Plug
Welch Catalog No.	3100B-01	3100C-02	3200B-01	3200C-02
VWR Catalog No.	84009-696	84009-698	84009-700	84009-702

8.20 FLOW CHART

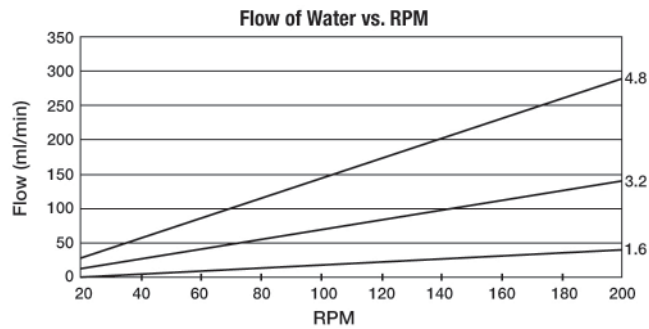


WARNING
Chart supplied as reference only. Actual flow rates may vary.

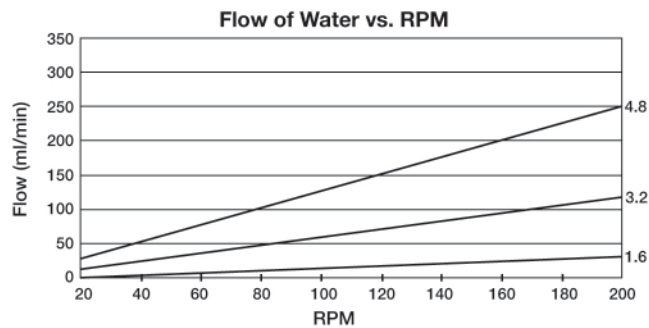
8.21 SILICONE



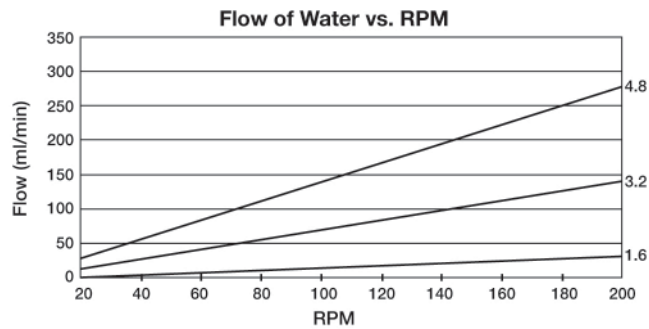
8.22 SANTOPRENE



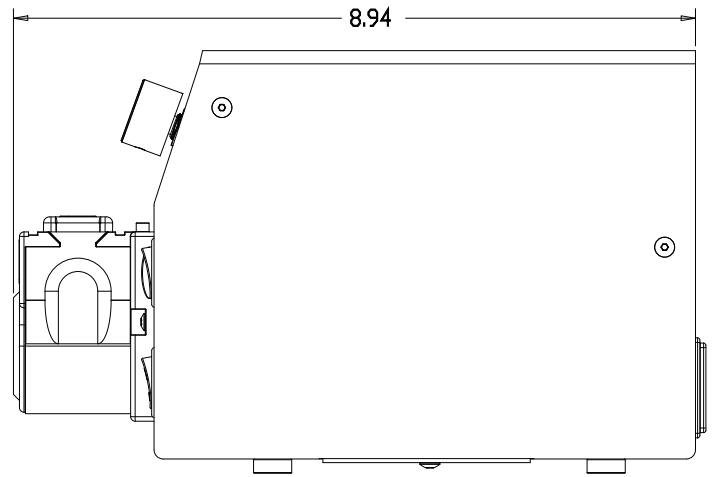
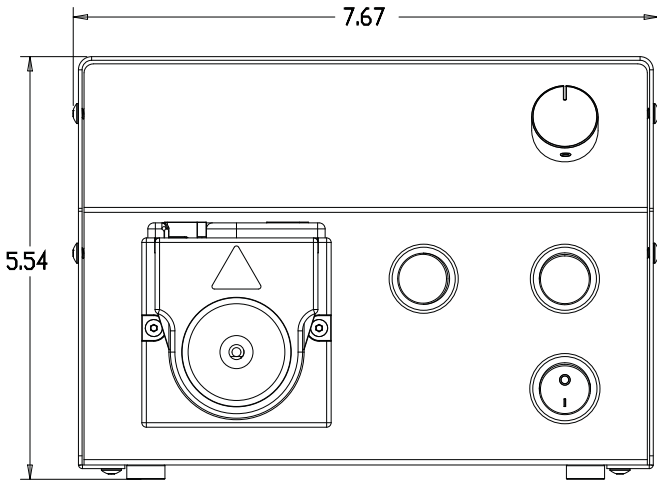
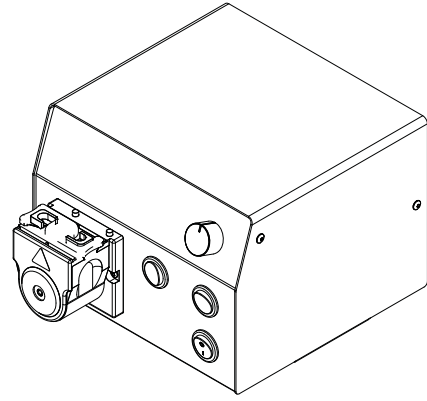
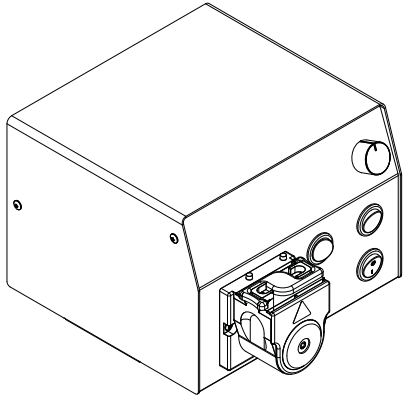
8.23 PVC



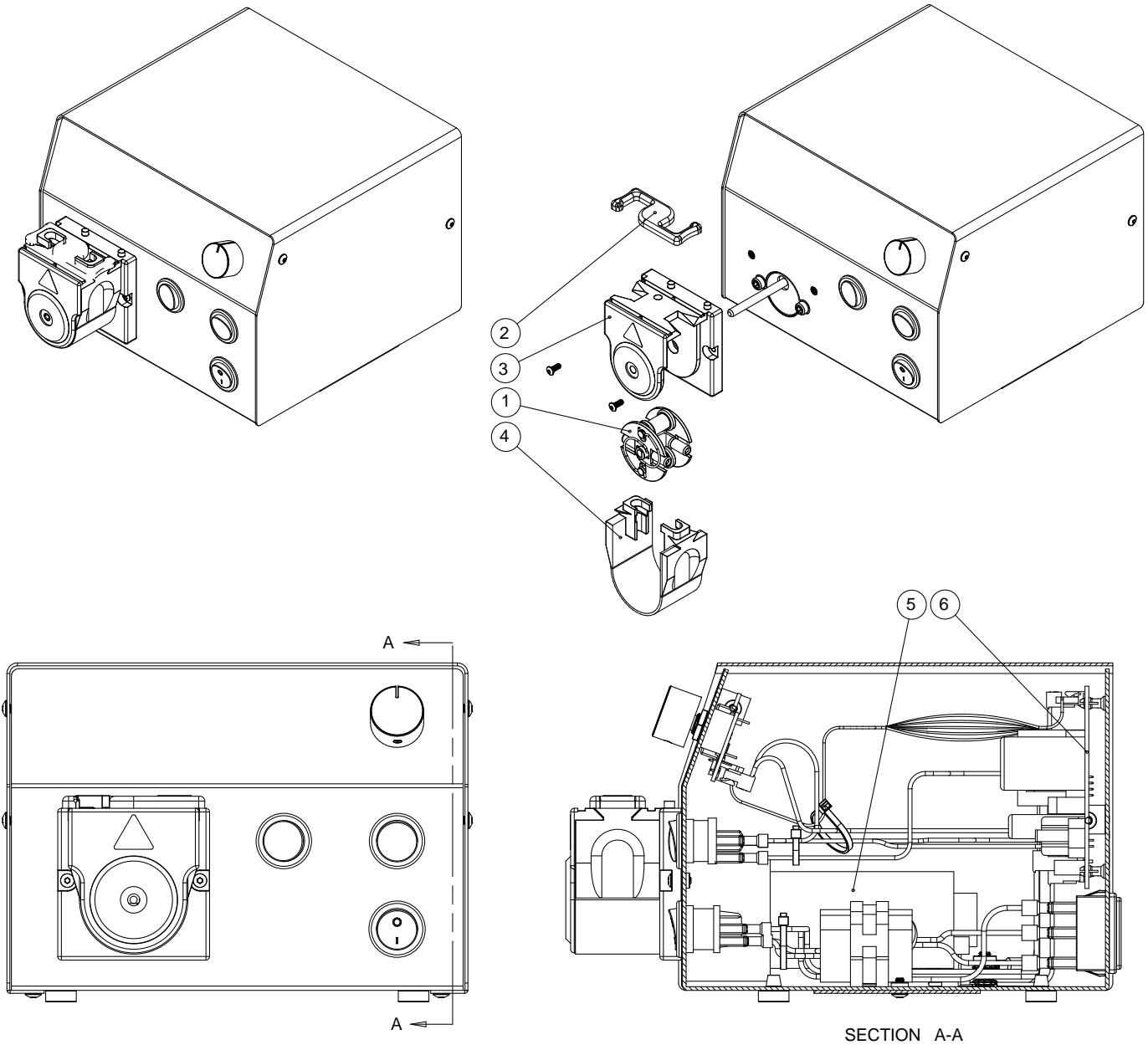
8.24 Fluoroelastomer ®



8.30 DIMENSIONAL DRAWING



8.40 DRAWING AND PARTS LIST



PARTS LIST FOR MODEL 3100 AND 3200

ITEM	QTY	DESCRIPTION
1	1	ROLLER CARRIER
2	1	LOCK
3	1	HEAD
4	1	ROLLER BAND
5	1	MOTOR
6	1	CONTROL BOARD

See section 6.10 for Replacement parts and kits.

Section 9: APPLICATION INFORMATION

9.10 LABORATORY RESEARCH AND DEVELOPMENT

- Dispensing and metering
- Cell Tissue transfer
- Destaining
- Perfusion
- Liquid Chromatography
- Fluid Transfer of acid and base solutions

9.20 PHARMACEUTICAL MANUFACTURING

- Dispensing
- Filtration
- Nutrient Addition
- Adjusting pH in Fermentation Process
- Foot switch available for on demand fluid transfer

9.30 COMMERCIAL FOOD PROCESSING

- Pumping viscous fluids and small particulates without clogging
- Easy cleanup
- Able to use on multiple processes
- Lok-n-Flow tubing cartridges – eliminate cross contamination

9.40 ENVIRONMENTAL

- Waste water sampling with suspended solids
- Foot switch for remote operation
- Self-priming
- Wide range of tubing material available to handle all types of solutions
- Sterilized tubing

9.50 GENERAL INDUSTRY

- Long tubing life for continuous duty
- Self-priming
- Able to run dry
- Slurry solutions for lapping
- The perfect choice for any application that is moving liquids, gasses, solids, or mixed phased media.

9.60 TUBING AND FITTING COMPATIBILITY CHART

- Visit: www.welchvacuum.com

Section 10: WARRANTY

IMPORTANT
Please Read Carefully Before Operating
This Welch® Vacuum Pump

UNPACKING

Inspect the pump carefully. If any damage has occurred, immediately file claim with the carrier immediately. Save the shipping container for carrier to inspect.

OPERATING PUMP

Refer to the enclosed Instruction/Operation Manual for all information to properly operate and maintain the pump.

WARRANTY

This Welch Vacuum product is warranted to be free from defects in material and workmanship. The liability of Welch-IImvac under this warranty is limited to servicing, adjusting, repairing or replacing any unit or component part which in the judgment of Welch-IImvac has not been misused, abused or altered in any way causing impaired performance or rendering it inoperative. No other warranties are expressed or implied. The method of executing this warranty: servicing, adjusting, repairing or replacing shall be at the discretion of Welch-IImvac. Vacuum pumps that have been used for any period, however short, will be repaired under this warranty rather than replaced.

The warranty is effective for one year from the date of original purchase when:

1. The warranty card has been completed and returned.
2. The product is returned to the factory or other designated service centers, freight prepaid.
3. The product in our judgment is defective through no action or fault of the user.

If the product has become defective through misuse, abuse, or alteration, repairs will be billed regardless of the age of the product. In this event, an estimate of the repair costs will be submitted and authorization of these charges will be required before the product is repaired and returned.

To reduce additional charges and delays either within or outside of the warranty period, contact Welch-IImvac @847-676-8800 for a return authorization number. Products without a return authorization number will be refused by our receiving department. Before shipping, properly pack the pump, insure it against loss or damage, and on the outside of the pump packaging and the packing slip write in the return authorization number. Pumps damaged due to improper packaging are the customer's responsibility.

Welch-IImvac
Vacuum Pump Repair Facility
5621 W. Howard Street
Niles, IL 60714
Phone: (847) 676-8800
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