



SP21
Peristaltic Sample Pump

Installation and Operation Manual



SP21 Peristaltic Sample Pump

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Flomotion Systems, Inc.

3 N. Main St, Middleport, NY 14105
Toll Free: (800)909-3569 (U.S. & Canada)
Tel: (716)691-3941
Fax: (716)691-1253
info@flomotionsystems.com
www.flomotionsystems.com

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1.0 - System Overview

The SP21 Peristaltic Sample Pump consists of a gearmotor and peristaltic pumphead.



**Model SP21
Pump, Motor & Gearbox**

1.1 Safety

In the interests of safety, this pump and the tubing selected should only be used by competent, suitably trained personnel after they have read and understood this manual, and considered any hazard involved. Any person who is involved in the installation or maintenance of this equipment should be fully competent to carry out the work.

Maintenance and repair should be performed by qualified personnel only. Make sure that no voltage is applied while work is being carried out on the pump or motor. The motor must be secured against accidental start up.

1.2 Warranty

Flomotion Systems, Inc. warrants all Flomotion Systems pumps against any defects that are due to faulty material or workmanship for a period of two years from date of shipment. In the event that a defect is discovered during the warranty period, Flomotion Systems, Inc. agrees that, at its option, it will repair or replace the defective product. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original product warranty period. This warranty does not apply to consumable components of a product such as, but not limited to, hose, tubing, rollers, and fuses.

Contact Flomotion Systems, Inc. or your distributor to initiate warranty support. Products may not be returned without authorization from Flomotion Systems, Inc. All returns shall be freight prepaid.

Limitations

This warranty does not cover:

- Damage caused by acts of God, natural disaster, labor unrest, acts of war (declared or undeclared), terrorism, civil strife, acts of any governmental jurisdiction or any other cause beyond the seller's control
- Damage caused by misuse, neglect, accident or improper application or installation
- Damage caused by any repair or attempted repair not authorized by Flomotion Systems, Inc.
- Any product not used in accordance with the instructions furnished by Flomotion Systems, Inc.

- Any product not paid in full in agreed upon terms.
- Modifications performed on this product by person(s) not authorized by Flomotion Systems, Inc.
- Freight charges to return merchandise to Flomotion Systems, Inc.
- Freight charges on expedited or express shipment of warranted parts or product
- Travel fees associated with on-site warranty repair

This warranty contains the sole express warranty made by Flomotion Systems, Inc. in connection with its products. All implied warranties, including with limitation, the warranties of merchantability and fitness for a particular purpose, are expressly disclaimed.

Some states within the United States do not allow the disclaimer of implied warranties and if this is true in your state the above limitation may not apply to you. This warranty gives you specific rights, and you may also have other rights that vary from state to state.

This warranty constitutes the final, complete, and exclusive statement of warranty terms and no person is authorized to make any other warranties or representations on behalf of Flomotion Systems, Inc.

1.3 Receiving

Inspect all cartons for damage, which may have occurred during shipping. Carefully unpack equipment and inspect thoroughly for damage or shortage. Report any damage to carrier and/or shortages to supplier. All major components and connections should be examined for damage and tightness, with special attention given to PC boards, plugs, knobs and switches.

1.4 Customer Modification

Flomotion Systems, Inc., its sales representatives and distributors, welcome the opportunity to assist our customers in applying our products. Many customizing options are available to aid in this function. Flomotion Systems, Inc. cannot assume responsibility for any modifications not authorized by its engineering department.

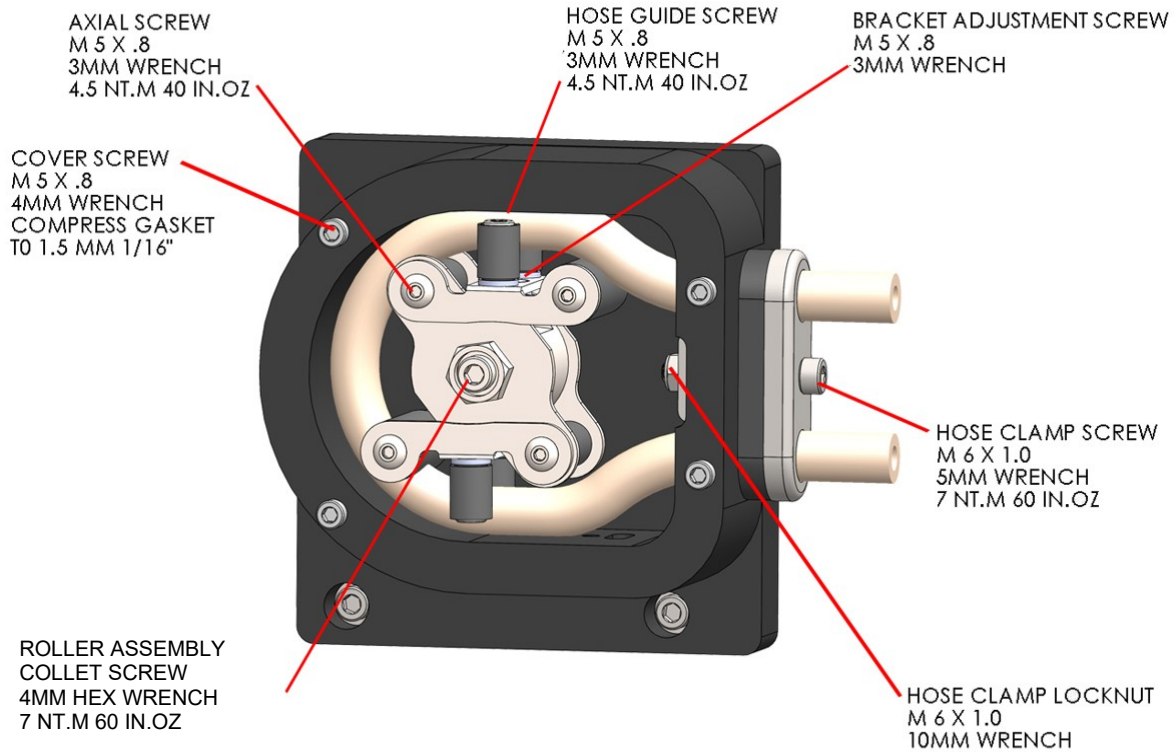
1.5 Information for Returning Pumps

Equipment that has been contaminated with, or exposed to, body fluids, toxic chemicals or any other substance hazardous to health must be decontaminated before it is returned to Flomotion Systems or its distributor.

Please contact Flomotion Systems for a Return Authorization number and instructions for returning the pump.

2.0 – SP21 Series Pump

The SP21 pumphead has two spring-loaded working rollers, which automatically compensate for minor variations in tubing wall thickness, giving extended tube life.

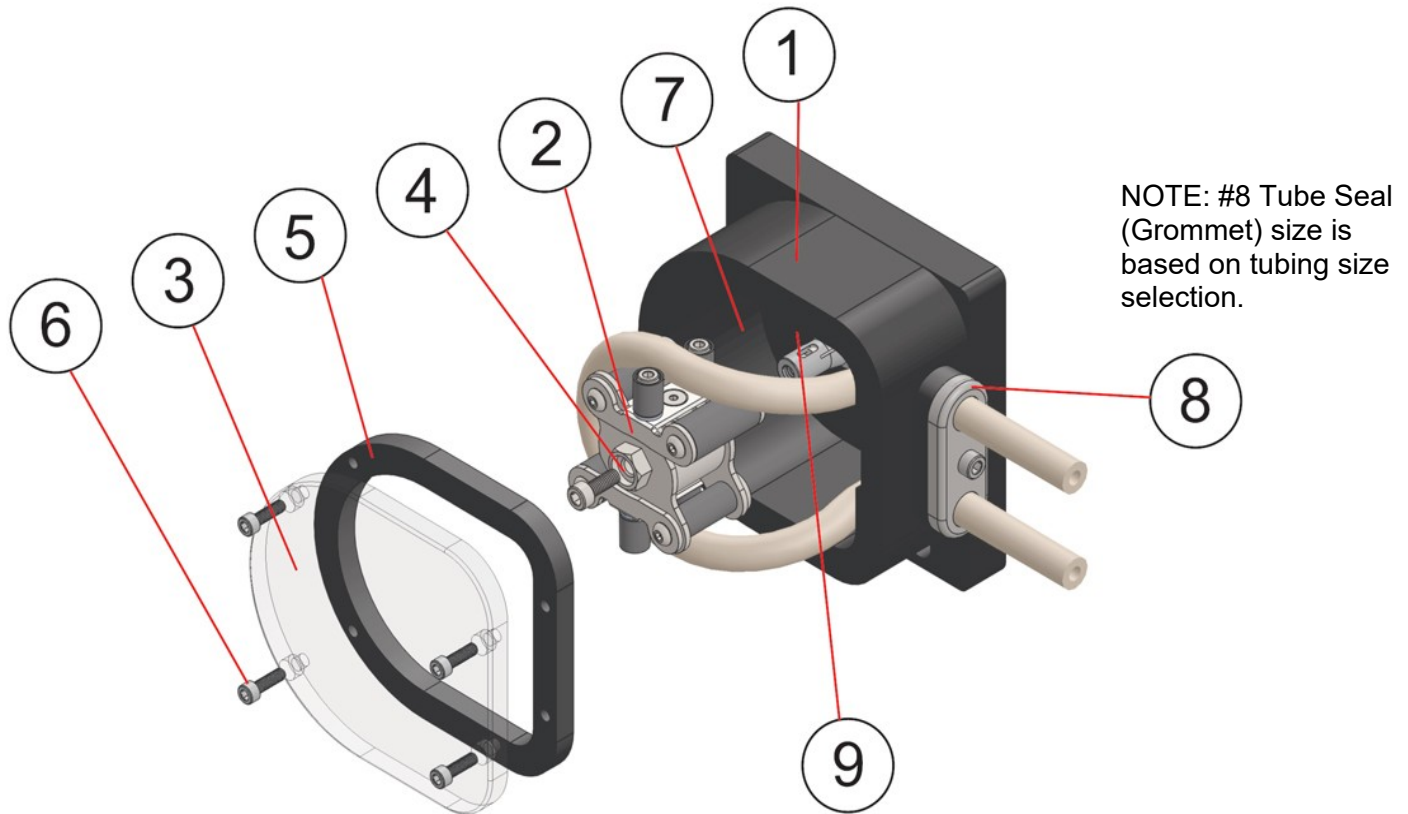


IMPORTANT: The SP21 is equipped with a pump cover for safety and protection against liquid spills. The cover must be installed whenever the pump is in use.

2.1 Tubing, Spindle and Cover Installation

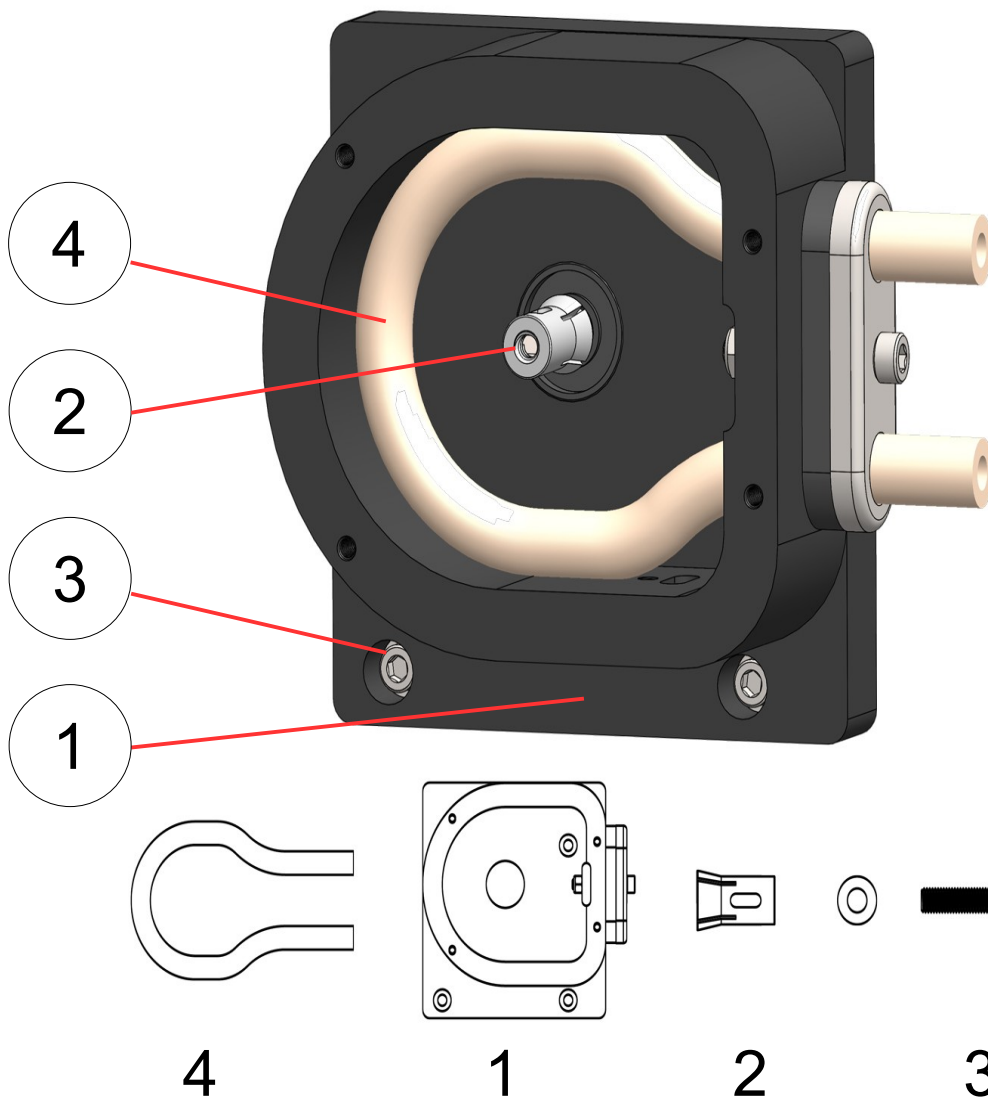
! IMPORTANT: Disconnect pump controller from power supply BEFORE changing tubing!

Item No.	Qty	Part No.	Description
1	1	n/a	Pump Body
2	1	100329	Roller Assembly
3	1	100330	Cover
4	1	100324	Collet Screw
5	1	100305C	Cover Gasket
6	4	100307C	Cover Screw
7	1	n/a	Tube
8	1	n/a	Tube Seal - Grommet (size is based on tubing size selection)



Tube is shown bent forward out of the pump housing to illustrate the correct tube and roller assembly position, prior to sliding the tube and spindle into the housing and over the collet.

2.2 Mounting Pump on Gearbox, Installation of Collet



Item No.	Qty	Part No.	Description
1	1	10333	Pump Housing with Tube Seal & Tube Seal Cover
2	1	100306	Collet
3	2	100330	Pump Mounting Screws
4	1	na	Hose

2.3 Pump Mounting and Collet Installation Procedure

1. To install the pump housing on the gearbox, slide it over the central pilot on the gearbox adaptor plate. Next install and torque the mounting screws to 5 NT.M (45 in. oz).
2. Next install the collet on the gearbox shaft. There is a slot in the collet that the flat drive tang on the gearbox shaft must slide into. Orient the collet to allow the drive tang to slide into the slot and push the collet completely onto the gearbox shaft. When the collet bottoms out it is in the correct position.

2.4 Hose and Roller Installation

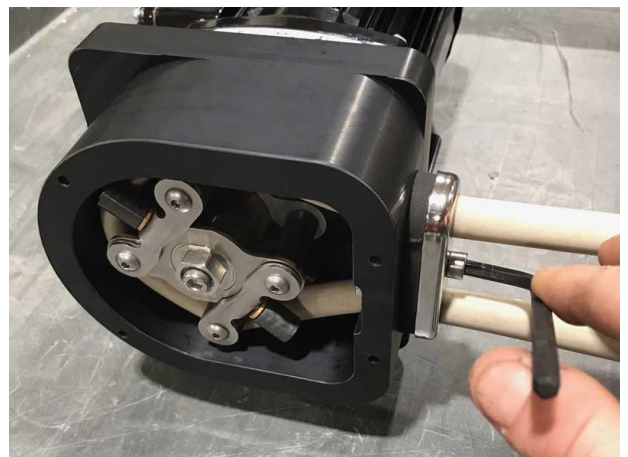
! IMPORTANT: Disconnect pump controller from power supply BEFORE changing tubing!

Disassembly:

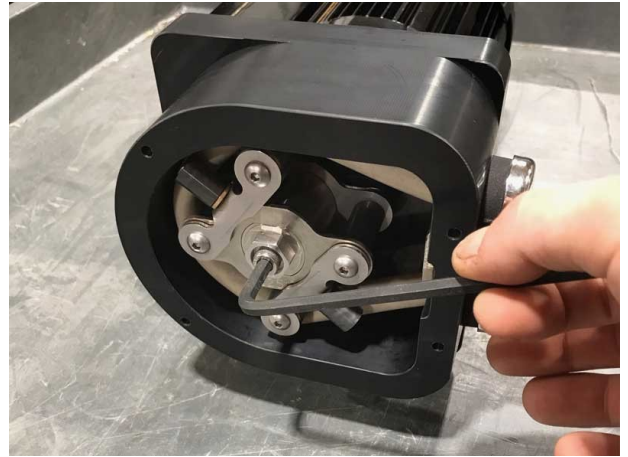
1. Remove four (4) 4mm pump cover screws.



2. Loosen Tube Seal Clamp Screw with 5mm hex wrench.



3. Remove 5mm collet screw.



4. Remove the roller assembly.



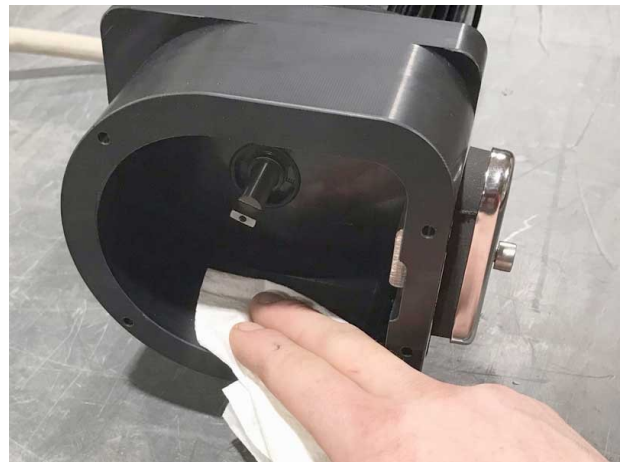
5. Remove worn pump tubing from pumphead.



6. Remove and inspect collet for wear. Note that the collet may remain in the roller assembly when the roller assembly is removed from the pump shaft.



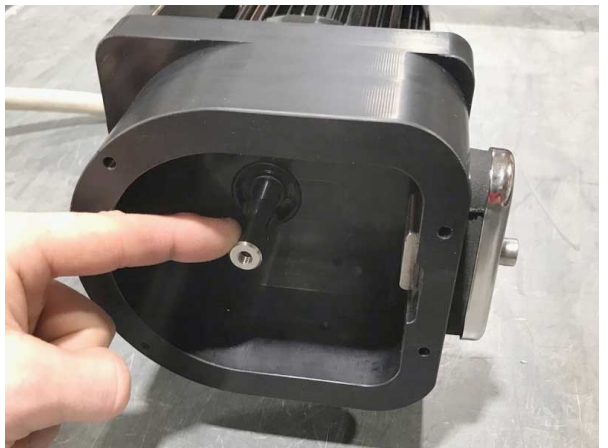
7. Clean inside of pump housing with damp rag or an appropriate cleaning solution to remove any chemical or tubing residue.



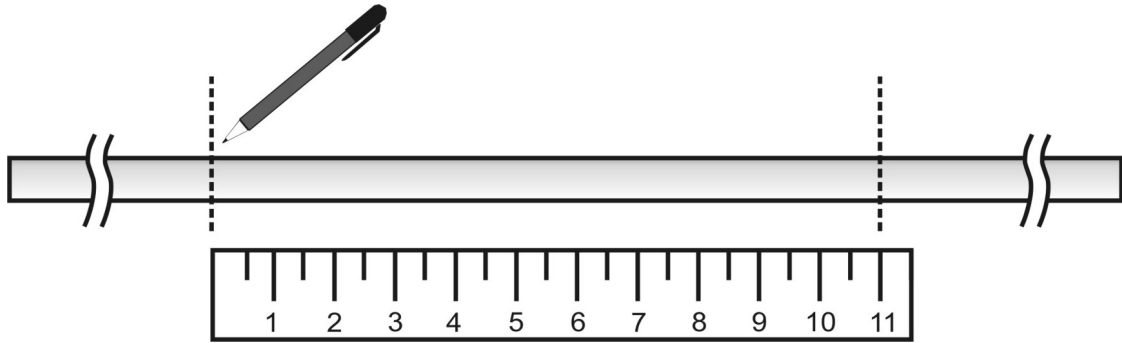
Reassembly:

1. Reinstall the collet onto the pump shaft.

There is a slot in the collet that the flat drive tang on the gearbox shaft must slide into. Orient the collet to allow the drive tang to slide into the slot and push the collet completely onto the gearbox shaft. When the collet bottoms out it is in the correct position.



2. Mark an 11" section of tubing, which will be the portion, contained within the pump. Leave sufficient excess on the suction and discharge sides of the pump for the desired connections. If you leave the excess intake tubing in a coil near the pump it will make it easy to feed a new section of tubing through the rollers when the section in the pump becomes worn.

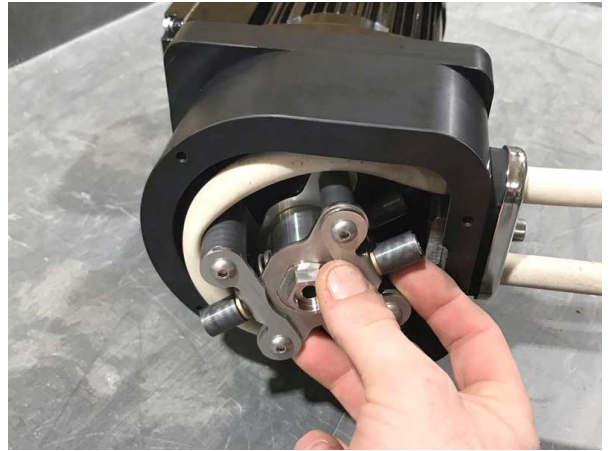


3. Install tubing into the pumphead.

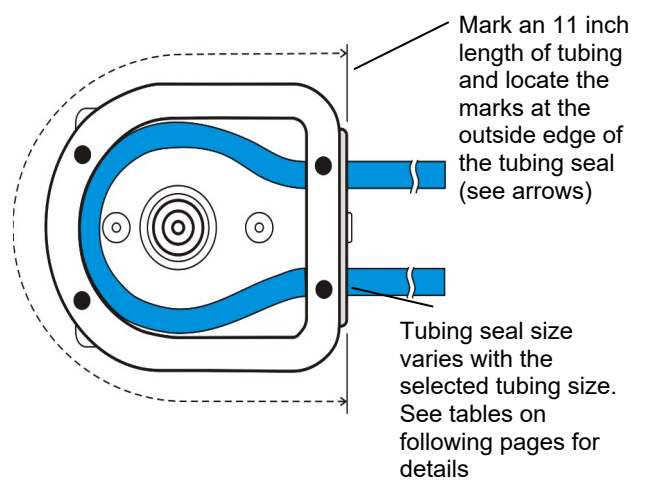
Note: During tubing installation the loop of tubing may develop a twist. Examine the tube for this condition and if needed turn one end of the tube where it exits the tubing clamp to eliminate the twist. Correctly adjusted the tubing loop will be flat and parallel to the front face of the pump housing.



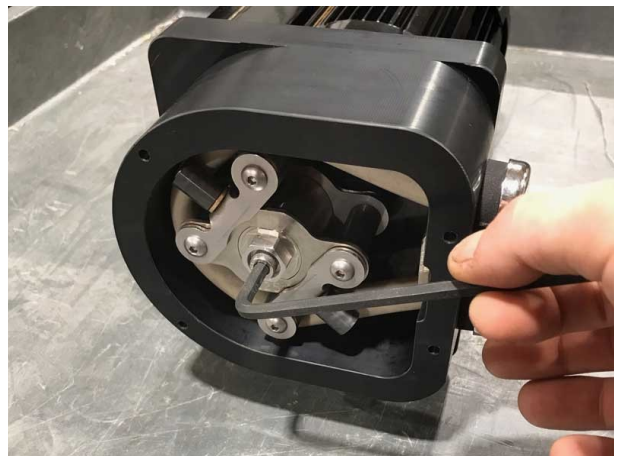
4. Loop tubing around roller assembly between guides as shown. Remove slack in tubing while rotating roller assembly and sliding onto collet.



5. Align marks on tubing with outside edge of the tubing clamp.



6. Reinstall collet screw firmly.



7. Tighten tube seal clamp screw. Be sure to tighten firmly to prevent “tubing walk.” Tubing walk can occur when the tube seal is the wrong size or is not sufficiently tight to keep the rollers from pulling the tubing through the pump as it rotates.

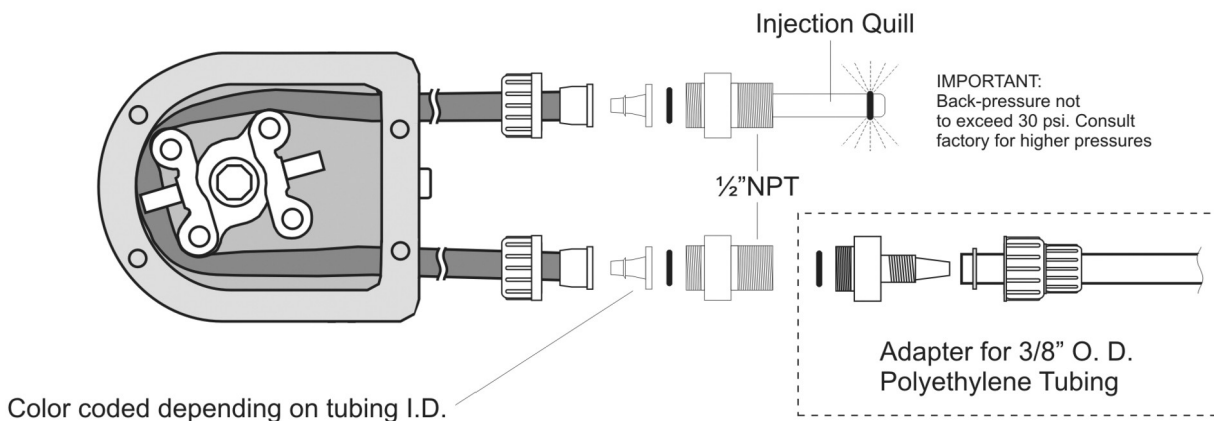


8. Inspect pump cover gasket. Replace if damaged. Reinstall pump cover gasket and cover.



2.5 Tubing & Connections

Tubing adapters are available for many configurations. See the drawing below for details.



SP21 Estimated Pumping Capacity*						
Tubing No.	#119	#120	#15	#24	#35 & 121	#36 & 122
Tubing Size (bore)	1.6mm (1/16")	3.2 mm (1/8")	4.8 mm (3/16")	6.4 mm (1/4")	8 mm (5/16")	9.6 mm (3/8")
ml/min @ 45 rpm	20 (0.32 gph)	85 (1.34 gph)	184.5 (2.92 gph)	333 (5.28 gph)	495 (7.85 gph)	648 (10.27 gph)
ml/rev	0.45	1.88	4.1	7.4	11	14.4

*Actual flow rates may vary

Tubing and Accessory Part Numbers

FLOPRENE TUBING - 50 Ft Length (Santoprene)

FLO.016.024	1.6mm (1/16") bore	100 PSI max	FLO.064.024	6.4mm (1/4") bore	50 PSI max
FLO.032.024	3.2mm (1/8") bore	100 PSI max	FLO.080.024	8.0mm (5/16") bore	30 PSI max
FLO.048.024	4.8mm (3/16") bore	70 PSI max	FLO.096.024	9.6mm (3/8") bore	30 PSI max

CONNECTORS / ADAPTORS

1/2" NPTM x pump tubing (bore as required)
 3/8" PE tubing x pump tubing (bore as required)
 Two-piece Color Coded Hose Barb & Collar Set.

PUMPHEAD HOSE SEALS

100329 Hose Seal	1.6mm (1/16") bore	100332 Hose Seal	6.4mm (1/4") bore
100330 Hose Seal	3.2mm (1/8") bore	100333 Hose Seal	8.0mm (5/16") bore
100331 Hose Seal	4.8mm (3/16") bore	100334 Hose Seal	9.6mm (3/8") bore

Tubing Connector Adapter Order Guide

TUBING CONECTORS ONLY – Does not include hose barb and collar set.

1 2 3 4 5 6 7 8

1 – 3 Process Connection Size

038 3/8" OD - PE Tubing Only
 050 1/2" OD – PE Tubing or 1/2" NPT

4 Process Connection Type

T PE Tubing
 N NPT

5 – 6 Pump Tubing Side

PT Pump Tubing Side

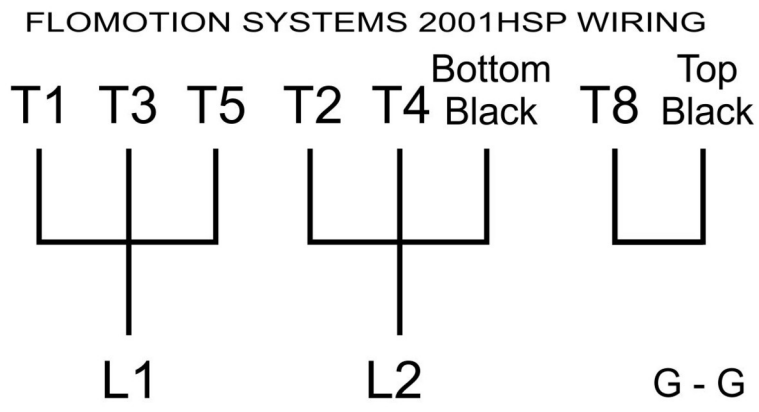
7 Connector Body Material of Construction

P PVC
 T PTFE (Teflon)
 K PVDF (Kynar)
 X Other

8 O-Ring Material of Construction

V Viton
 E EPDM

3.0 - Motor Wiring



4.0 - Dimensions

