OPERATING INSTRUCTIONS

L/S® Multichannel Pump Head

Model Nos.
07534-04
07534-08
A-1299-1008
Edition 02

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Viton—Reg TM DuPont Dow Elastomers LLC
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1. Safety Precautions

**WARNING:** Tubing breakage may result in fluid being sprayed from pump. Use appropriate measures to protect operator and equipment.

Turn off drive before removing or installing tubing. Safety guard is provided to minimize risk of fingers getting caught between roller mechanism and the base of the module. However, be safe—keep your fingers away from these areas.

**CAUTION:** Use only tubing combinations defined by Tables 1 and 2 (See page 9). Use of other tubing could cause malfunction or damage to the pump.

**WARNING: PRODUCT USE LIMITATION**

These products are not designed for, or intended for use in, patient-connected applications, including, but not limited to, medical and dental use and, accordingly, have not been submitted for FDA approval.

2. Introduction

The instructions in this manual are task-oriented for easy reference. You can go directly to a particular section and quickly find the answers. Appendix A (See page 12) lists tubing loading capacity depending on the maximum rpm of your Masterflex® L/S® pump drive used with this system.

**Pump Heads**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>07534-04</td>
<td>6 roller, 4 channel</td>
</tr>
<tr>
<td>07534-08</td>
<td>6 roller, 8 channel</td>
</tr>
</tbody>
</table>

These multichannel pumps, designed to provide up to eight simultaneously driven pump channels, incorporate the following features:

- Simultaneous dispensing through up to eight separate channels with one set-up and pump cycle.
- Six-roller design that provides reduced pulsation

2.1 Application Data

The pump head is designed for multichannel use. Tubing found in Table 2 (See page 9) may be used to deliver from .0026 to 200 mL/min.

2.2 General Description

Each pump head is constructed with rugged anodized aluminum frames, stainless steel rotor assemblies, and either one or two precision machined aluminum occlusion beds. Occlusion beds are designed to compress the Masterflex microbore tubing for optimum performance—no occlusion adjustment is required. Each occlusion bed will accommodate up to 4 channels of microbore tubing. Pump heads can be stacked (up to eight, 4-channel or four, 8-channel pump heads) to allow up to 32 channels of simultaneous pumping. Each pump head contains 6 rollers with shielded stainless steel bearings, and can quickly mount to most existing Masterflex® L/S® tubing pump drives.

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Figure 1, Pump Heads
3. Installation

Tool required: long hex key (provided)

Mount the pump head to a Masterflex® L/S® pump drive as follows:
1. Connect the pump head to the drive by aligning the tang on the pump head (Figure 2) with the slot in the motor drive shaft.
2. Attach pump head to drive unit using the long hex key to tighten the four screws (provided).

3.1 Stacking Multiple Pump Heads

L/S Multichannel pump heads can be stacked (up to eight, 4-channel or four, 8-channel pump heads) to provide 32 pumping channels from a single drive, depending on the torque capabilities of the drive (Appendix A).

Stack multiple heads as follows:
1. Mount first head to drive per previous instructions.
2. Align the tang and the holes on the back of the second pump head with the slot and the dowel pins on the front of the first pump head.
3. Fasten the pump heads together with the four screws (provided) using the holes in the four corners of the pumps.

Figure 2, Pump Mounting

Figure 3, Stacking Pump Heads

Adhesive backed support feet (supplied) may be used to stabilize pump stack. Remove adhesive backing and attach feet to underside of front plate of front pump.
4. Setup

Multichannel pump heads accommodate a broad range of tubing sizes as noted in Tables 1 and 2 (See page 9).

4.1 Select Tubing

Depending on which pump head is used, up to four or eight tubing sets can be teamed up in a single pump head. Tubing sizes can be intermixed within each occlusion bed as long as the same tubing material is used (Figure 4).

Use only Masterflex microbore tubing sets with Masterflex tubing pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

![Microbore Tubing Set](image)

4.2 Tube Loading

**WARNING:** Turn off drive before removing or installing tubing. Safety guard is provided to minimize risk of fingers getting caught between roller mechanism and the base of the module. However, be safe—keep your fingers away from these areas.

**CAUTION:** Use only tubing combinations defined by Tables 1 and 2 (See page 9). Use of other combinations could cause malfunction or damage to the pump.

With the drive stopped, follow this procedure to install tubing:

1. Release latch and open occlusion bed (Figure 5).
2. From the top of the pump head, insert one end of the tubing over rollers. While holding occlusion bed, open spring loaded safety guard enough so that tubing can be inserted between guard and slotted tubing retainer (Figure 6).
3. Place tubing stop collar into slot to secure (Figure 7).
4. Making sure not to twist tubing, lightly stretch it across rollers to secure tubing stop collar in corresponding slot on the opposite end of pump head (latch side) (Figure 8).

Repeat the process for additional tubing channels as required.

![Release latch and open occlusion bed](image)

Figure 5, Release latch and open occlusion bed.

![Insert one end of the tubing over rollers](image)

Figure 6, Insert one end of the tubing over rollers.

![Place tubing stop collar into slot to secure](image)

Figure 7, Place tubing stop collar into slot to secure.
Bi-directional Pumping
Fluids can be pumped into and back out of containers by reversing the drive.

Partial Bank Pumping
The pump can be operated with either a partial or full bank of tubing sets.

5. Operation
This section describes the procedures for obtaining the desired performance.

5.1 Select Tubing and Pump Heads
Use Tables 1 and 2 (See below) to select the tubing to provide the required single channel flow rate.

Table 1 - Flow Rates

<table>
<thead>
<tr>
<th>Drive Rpm</th>
<th>Units</th>
<th>0.19</th>
<th>0.25</th>
<th>.89</th>
<th>1.42</th>
<th>2.06</th>
<th>2.79</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 mL/min</td>
<td></td>
<td>.26</td>
<td>.53</td>
<td>5.4</td>
<td>12</td>
<td>23</td>
<td>35</td>
</tr>
<tr>
<td>600 mL/min</td>
<td></td>
<td>Not * recommended</td>
<td>Not * recommended</td>
<td>30</td>
<td>67</td>
<td>125</td>
<td>200</td>
</tr>
</tbody>
</table>

*Not recommended to use these tubing sizes at speeds greater than 300 rpm.

See Appendix B (Page 13) for ordering information on the Masterflex® Microbore Two-Stop Pump Tube Sets.

Table 2 - Compatible Tubing

<table>
<thead>
<tr>
<th>Tubing Material</th>
<th>Microbore Tubing Set (mm ID)*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.19</td>
</tr>
<tr>
<td>Soft</td>
<td></td>
</tr>
<tr>
<td>Silicone (platinum)</td>
<td></td>
</tr>
<tr>
<td>Stiff</td>
<td>✓</td>
</tr>
<tr>
<td>PVC</td>
<td>✓</td>
</tr>
<tr>
<td>Viton*</td>
<td></td>
</tr>
<tr>
<td>Santoprene*</td>
<td>✓</td>
</tr>
</tbody>
</table>

*Use only specially designed microbore tubing sets.
6. Maintenance

No maintenance is required. Wipe the pump head with a clean cloth and a mild detergent to clean. Never immerse or use excessive fluid.

6.1 Service Parts

Hex Key (9/64-in. hex)
- Model 07534-04: A-3502
- Model 07534-08: A-4376
Mounting Screws: B-1079-0515
Support Foot: A-1390-0003

7. Specifications

PUMP HEAD SPECIFICATIONS

<table>
<thead>
<tr>
<th>Speed Range:</th>
<th>1 to 600 rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque Load:</td>
<td>5 oz-in (max.) with no tubing</td>
</tr>
<tr>
<td>Operating Temp. Range:</td>
<td>0° to 40°C (32° to 104°F)</td>
</tr>
<tr>
<td>Storage Temp. Range:</td>
<td>−40° to 110°C (−40° to 230°F)</td>
</tr>
</tbody>
</table>

Dimensions:
- 07534-04: 3”L x 4.5”W x 3”H (75 mm x 115 mm x 75 mm) 2.5 lb (1.2 kg)
- 07534-08: 4.8”L x 4.5”W x 3”H (122 mm x 115 mm x 75 mm) 3.9 lb (1.8 kg)

8. Warranty

Use only Masterflex microbore tubing sets with Masterflex pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

The Manufacturer warrants this product to be free from significant deviations from published specifications. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

The warranty period for this product is noted on the warranty card.

9. Product Return

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside the warranty period. When returning the product, please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.
11. Appendix B Masterflex® Microbore Two-Stop Tube Sets

<table>
<thead>
<tr>
<th>Tubing ID (mm)</th>
<th>Platinum-cured silicone</th>
<th>Santoprene®</th>
<th>PVC</th>
<th>Viton®</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.19</td>
<td>—</td>
<td>—</td>
<td>06416-10</td>
<td>—</td>
</tr>
<tr>
<td>0.25</td>
<td>—</td>
<td>06431-12</td>
<td>06416-12</td>
<td>—</td>
</tr>
<tr>
<td>0.89</td>
<td>06421-26</td>
<td>06431-26</td>
<td>06416-26</td>
<td>06428-26</td>
</tr>
<tr>
<td>1.42</td>
<td>06421-34</td>
<td>06431-34</td>
<td>06416-34</td>
<td>06428-34</td>
</tr>
<tr>
<td>2.06</td>
<td>06421-42</td>
<td>06431-42</td>
<td>06416-42</td>
<td>06428-42</td>
</tr>
<tr>
<td>2.79</td>
<td>06421-48</td>
<td>06431-48</td>
<td>06416-48</td>
<td>06428-48</td>
</tr>
<tr>
<td>Quantity/pk</td>
<td>6</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

* Number of channels may be achieved by stacking any combination of 4 and 8 channel heads.

Additional channel capacity may be possible with certain tubing sizes and materials. Contact the Manufacturer or authorized seller for details.