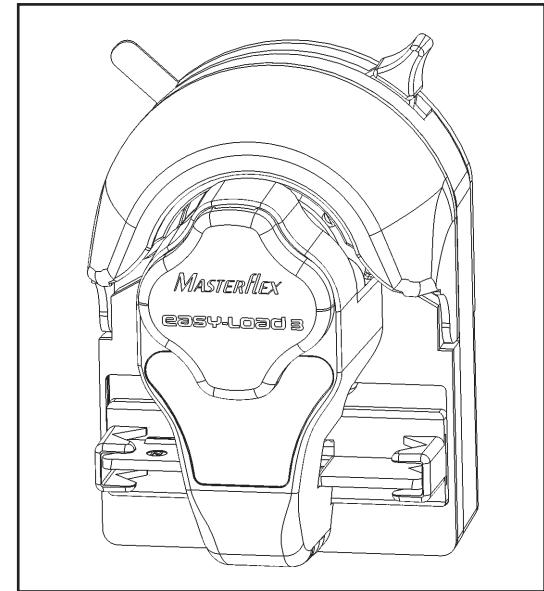


OPERATING MANUAL

MASTERFLEX[®] L/S[®]

EASY-LOAD[®] 3 PUMP HEADS

Model Numbers 77800-50, -52, -60 and -62



A-1299-5093B
Edition 12

MASTERFLEX[®]

(US & Canada only) Toll Free 1-800-MASTERFLEX • 1-800-637-3739
(Outside US & Canada) 1-847-381-7050
www.masterflex.com • techinfo@masterflex.com

SAFETY PRECAUTIONS

WARNING: PRODUCT USE LIMITATION



This product is not designed for, nor intended for use in, patient-connected applications, including, but not limited to medical and dental use and, accordingly, has not been submitted for FDA approval.

NOTE: Use only MASTERFLEX precision tubing with MASTERFLEX pumps to ensure optimum performance. Use of other tubing may void applicable warranties.

WARNING: To reduce risk of electrical shock, connect only to a properly grounded, grounding-type receptacle.

WARNINGS: Turn drive off before removing, adjusting or installing tubing. Fingers or loose clothing could be caught in the rollers.



(The rotor is partially exposed when the Actuator lever is in the open position.)

Do not remove back cover. The strong spring inside may cause injury.

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

WARNING: Risk of crushing. Keep fingers away from rotor while pump is in operation. Stop pump before loading or unloading tubing.



Fingers may be trapped between rollers on the pump rotor.

PUMP FOR LIQUIDS ORIGINAL INSTRUCTIONS

EXPLANATION OF SYMBOLS



WARNING: This word and symbol are needed in safety messages for hazards that are not immediately accessible, but that present a probability of serious personal injury if the hazards are not avoided. These safety messages describe precautions that must be taken to avoid hazards.



WARNING or DANGER: Warning or Danger with this symbol indicates probability of serious injury exists if crushing hazard is not avoided.

C-FLEX, NORPRENE, PharMed, TYGON — Reg TM Saint-Gobain Performance Plastics Corp.
VITON — Reg TM E.I. duPont DeNemours & Co.

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US Patent 7,478,999

WARRANTY

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 two (2) years from the date of purchase.

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 of 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.

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

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MAINTENANCE AND CLEANING

- No lubrication is required for the L/S EASY-LOAD 3 Pump Head.
- Use a mild detergent solution or 70% isopropyl alcohol only to clean the Pump Head.
- Do not immerse nor use excessive fluid.
- This pump requires no maintenance, other than cleaning. There are no user serviceable or replaceable parts inside.

REPLACEMENT PARTS AND ACCESSORIES

Mounting Plate Kit for L/S EASY-LOAD 3 Pump Heads: 77800-00

Kit contains (4) 8-32 screws and the mounting plate.

This kit adapts the EASY-LOAD 3 Pump Head to MASTERFLEX L/S pump drives.

SPECIFICATIONS

Pump Head Number	Roller and Bearing Material	Number of Rollers	L/S® Tubing
77800-50	CRS and Carbon Steel	3	L/S® 13, 14, 16, 25, 17, 18
77800-52	CRS and Carbon Steel	3	L/S® 15, 24, 35, 36
77800-60	Stainless Steel	3	L/S® 13, 14, 16, 25, 17, 18
77800-62	Stainless Steel	3	L/S® 15, 24, 35, 36

Typical Flow, Pressure and Vacuum Data—3 roller pumps

L/S® Tubing	Flow rate*		Max. Discharge Pressure* psig (bar)	Vacuum* @ 600 rpm in (mm) Hg	Suction Lift* @ 600 rpm ft (m) H ₂ O
	@ 1 rpm mL/Rev	@ 600 rpm mL/min			
L/S® 13	0.06	36	40 (2.7)	26 (660)	29 (8.8)
L/S® 14	0.22	130	40 (2.7)	26 (660)	29 (8.8)
L/S® 16	0.80	480	40 (2.7)	26 (660)	29 (8.8)
L/S® 25	1.7	1000	35 (2.4)	26 (660)	29 (8.8)
L/S® 17	2.8	1700	20 (1.4)	20 (510)	22 (6.7)
L/S® 18	3.8	2300	15 (1.0)	20 (510)	22 (6.7)
L/S® 15	1.7	1000	40 (2.7)	26 (660)	29 (8.8)
L/S® 24	2.8	1700	40 (2.7)	26 (660)	29 (8.8)
L/S® 35	3.8	2300	35 (2.4)	26 (660)	29 (8.8)
L/S® 36	4.8	2900	20 (1.4)	24 (610)	27 (8.3)

Number of rollers:	3
Maximum pump speed (rpm):	600
Maximum torque load—Starting:	400 oz-in (29 kg-cm)
Maximum torque load—Running:	Up to 180 oz-in (13 kg-cm)
Housing materials:	Glass-filled polypropylene (PP), polyphenylene sulfide (PPS), nylon (PA)
Roller materials:	Cold-rolled steel (CRS) / Stainless steel (SS)
Bearing materials:	Carbon steel / sealed stainless steel
Rotor materials:	Stainless steel
Chemical resistance:	Most substances, except strong acids or alkalis, organic solvents or hydrocarbons.
Operating Temperature†:	32°F to 104°F (0°C to 40°C)
Storage Temperature:	–49°F to 149°F (–45°C to 65°C)
Humidity:	10% to 90% (non-condensing)
Altitude:	2000 m or less
Dimensions (W × H × D):	(Excluding shaft and cosmetic cover)
Operating:	3.45" × 4.75" × 3.08" (8.8 cm × 12.1 cm × 7.8 cm)
Open:	3.45" × 5.65" × 3.08" (8.8 cm × 14.4 cm × 7.8 cm)
Weight:	1.1 lb (0.5 kg)
Noise level:	<70 dBA @ 1 meter
Compliance (CEmark):	EN809 (EU Machinery Directive)

* For NORPRENE®, PHARMED® BPT, and TYGON® tubing.

Values will be less with silicone, C-FLEX®, and Viton®.

Flow rate and discharge pressure will vary based on tubing size, formulation, and operating temperature.

The chart above is only a guide.

† Use in this temperature range for continuous duty operation with no decrease in performance or product life.

Pump Heads will work outside this range with some possible reductions in performance or product life.

INTRODUCTION AND GENERAL DESCRIPTION

This L/S® EASY-LOAD® 3 Pump Head, when combined with a MASTERFLEX L/S drive or compatible system, is designed to provide a simple, easy-to-use peristaltic pump system. The Pump Head accepts several different tubing sizes for a wide range of flow rates. The unique lever actuator design and automatic tubing retention allow quick tubing changes. This pump is designed to transfer or dispense liquids of various viscosities, as well as solids suspended in liquids. It is NOT intended to pump flammable or explosive substances.

A mounting kit adapts this pump to MASTERFLEX L/S drives. The kit includes a mounting plate and four screws, which are used to attach the mounting plate to a drive. Pumps are easily and quickly attached to the mounting plate, or another pump, by means of the bayonet feature on the back of the pump. The pump may be mounted with tubing entering and exiting to the left, right, up or down. Mounting orientation options may be limited with some drives. Pumps are just as easily removed, using the one-finger release lever on the upper left side of the pump. The tang on the pump shaft couples the pump to standard MASTERFLEX drives, for power transmission.

Each pump is supplied complete with a 17-inch (43-cm) length of tubing, one mounting kit and this manual. A Phillips screwdriver is required to complete installation.

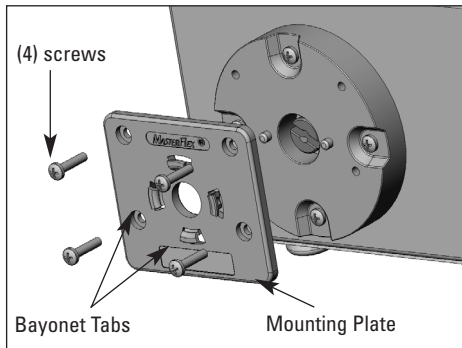


FIGURE 1
Attaching Mounting Plate to Drive

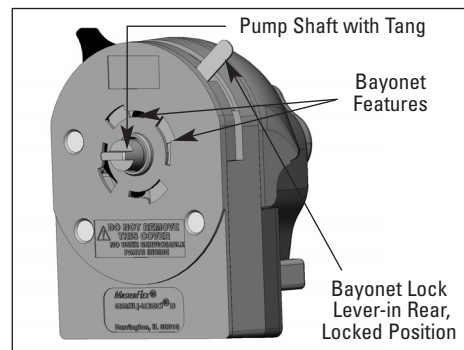


FIGURE 2
Back of EASY-LOAD 3 Pump



CAUTION: Be sure that bayonet features on back of each pump are fully engaged with bayonet tabs on front of mounting plate or adjacent pump front before operating pump. Bayonet lock lever (see Figure 5) will snap back when bayonet features engage completely.

NOTE: The tubing on the inside L/S EASY-LOAD 3 Pump Head(s) can be changed without removing the outside Pump Head(s) from the drive.

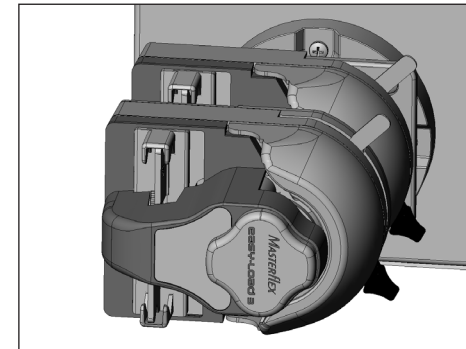


FIGURE 10
Drive with 2 Pumps Locked in Position

MULTI-CHANNEL MOUNTING

L/S EASY-LOAD 3 Pump Heads can be mounted in tandem (up to three), depending on the torque capabilities of the drive. (See Figures 8, 9 and 10.) Once the mounting plate is attached to a drive, no other mounting hardware is required. To use 4 pumps on one drive, call dealer for recommendations.

To install a second pump, the cosmetic cover must be removed from the first pump. Grasp the cover by the notches and pull it off. (See Figure 8.) Align the second pump to the first, as if the first pump were a drive. Follow single pump mounting instructions in "INSTALLATION AND REMOVAL". (See Figures 9 and 10.)

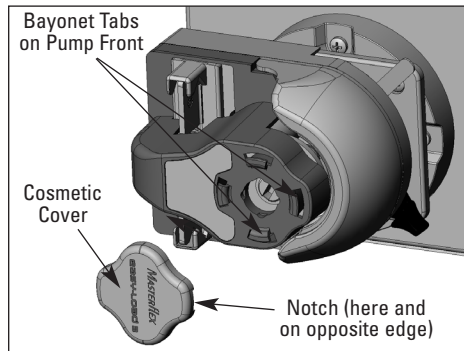


FIGURE 8
Preparation to Mount a Second Pump

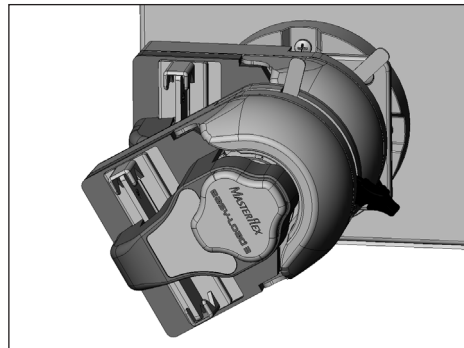


FIGURE 9
Engaging Bayonet Feature of Second Pump to Bayonet Tabs on First Pump

INSTALLATION and REMOVAL



WARNING: Stop the drive before installing or removing the pump from a drive

Attach the mounting plate to the MASTERFLEX drive, with the four Phillips head screws provided in the mounting kit. (See Figure 1.) Orient the pump with its back facing the drive. Insert the tang on the pump shaft into the slot in the shaft on the drive. Align the bayonet features on the pump back with the bayonet tabs on the front of the mounting plate. (See Figures 1, 2 and 3.) The pump should be tilted about 30 degrees counter-clockwise from the intended installed orientation. Finally, press the pump firmly against the drive and rotate clockwise, until no more rotation is possible (about 30 degrees). (See Figure 4.) The bayonet lock lever will snap toward the back of the pump and automatically lock the pump to the mounting plate.

To remove the pump from the drive, pull the bayonet lock lever forward. Hold the lever forward while rotating the pump as far counterclockwise as possible (approximately 30 degrees). Then pull the pump away from the drive. The actuator lever should be in the far right position when removing the pump. (See Figure 5.)

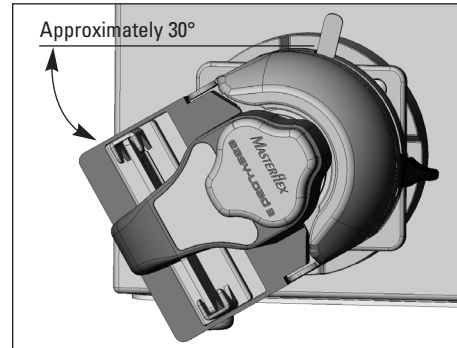


FIGURE 3
Position for Engaging Bayonet Feature for Horizontal Mounting

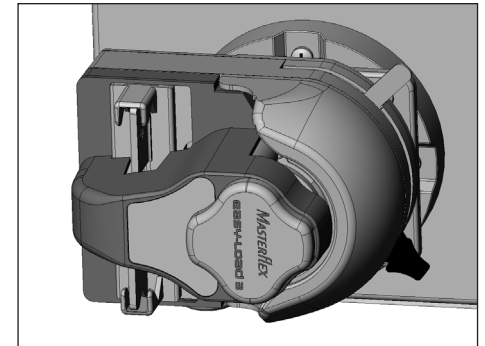


FIGURE 4
Pump Bayonet Feature Locked in Horizontal Pump Orientation

TUBING LOADING and UNLOADING



WARNING: Stop the drive before installing or removing tubing from the pump.

To load tubing, open the pump by moving the actuator lever counterclockwise (left, if pump is mounted vertically). (See Figures 5 and 6.) Insert a loop of tubing into one open tubing retainer, between the occlusion bed and the rollers and into the other tubing retainer. (See Figure 7.) Position the tubing so that it is firmly against the rollers and centered on the length of the roller. While holding the tubing ends, move the actuator lever back to the far clockwise (right) position, as shown in Figure 5. The pump will automatically grip the tubing. Tubing sizes L/S® 13, L/S® 14, L/S® 16, L/S® 25, L/S® 17 and L/S® 18 (thin wall) will automatically be stretched by the pump. Approximately 5 pounds of force must be applied to the actuator lever to fully close the pump and place the lever in its locked position (far right position) or to fully open the pump (far left position). **NOTE:** It is not necessary to have an end of the tubing free to load or unload tubing from the pump. A length of tubing, attached to other devices, may be loaded into the pump, without disconnecting the tubing from adjacent devices.

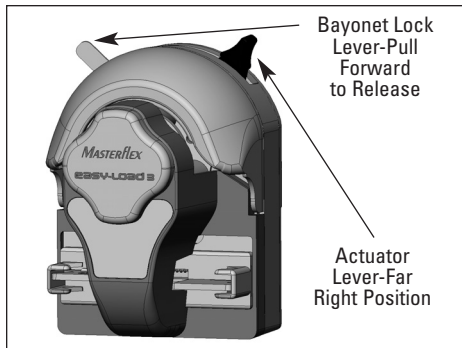


FIGURE 5
EASY-LOAD 3 Pump
in Fully Closed Position

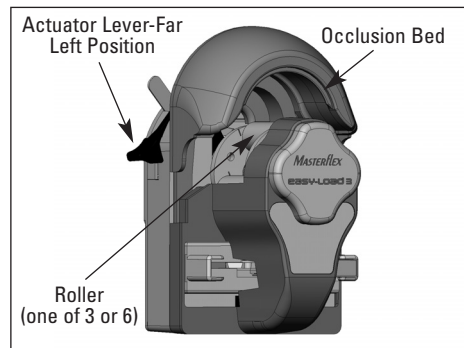


FIGURE 6
EASY-LOAD 3 Pump
in Fully Open Position

To unload tubing from the pump, turn off the drive. Then open the pump by moving the actuator lever counterclockwise (left), as described above. The pump will automatically open the tubing retainers, as well as lifting the occlusion bed away from the tubing. Then pull the tubing away from the pump front.

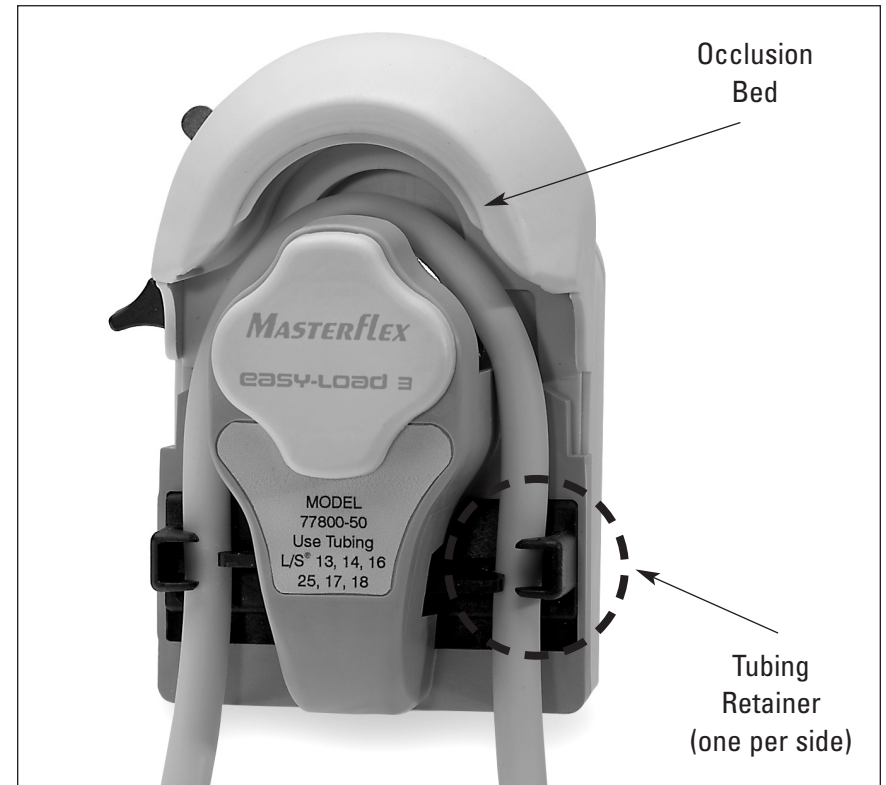


FIGURE 7
Tubing Path Through Pump—During Loading

NOTE: When pump is not being used, store with actuator lever halfway between far left and far right positions. (See figures 5 and 6.)