I/P® RAPID-LOAD® PUMP HEAD TECHNICAL DATA SHEET

GENERAL DESCRIPTION

The Masterflex® I/P® Rapid-Load® Pump Head provides high volumetric flow and pressure performance that make it ideal for use in filtration, general transfer, and metering applications. The unique design allows for fast tubing replacement and its positive retention secures tubing in place to enhance performance and repeatability.



APPLICATION

Ideal for high volume transfer, filtration, and bag-filling applications

FEATURES/BENEFITS

- Single-action opens pump head and occlusion surface - so tubing changes are fast and easy
- Deliver flow rates from 0.001 to 19.0 LPM
- Hard-coat anodized aluminum construction is extremely durable and corrosion resistant - ready to withstand washdown environments and common sanitizing solutions
- C-shaped design allows tubing to enter and exit the same side of the pump head - facilitates connection to tubing inlet and outlet
- Models available for Masterflex® I/P® precision pump tubing and high-performance precision pump tubing sizes in all formulations
- Stainless steel (SS) rotor/roller assembly for durability and chemical resistance
- Tubing enables better pressure generation and suction lift; ideal for viscous fluid transfer
- Guide rollers stabilize tubing and ensure quiet operation
- Efficient operational footprint saves bench space and provides installation flexibility
- Open-Head Sensor technology shuts off drive motor if pump head is opened

TUBING SIZING CHART

Pump tubing size	Tubing ID	Flow rate – mL/rev	LPM @ 650 rpm	Max pressure†	Max vacuum†	Suction lift
I/P® Precision pump tubing						
I/P 26	6.4 mm (0.25″)	6.7	4.0	2.7 bar (40 psi)	660 mm Hg (26″ Hg)	8.8 m H_2O (29 ft H_2O)
I/P 73	9.5 mm (0.37″)	13.4	8.0			
I/P 82	12.7 mm (0.5″)	20.8	13.0	1.4 bar (20 psi)	510 mm Hg (20″ Hg)	7.0 m H2O (23 ft H2O)
I/P® High-Performance Precision pump tubing						
I/P 70	9.5 mm (0.37″)	13.4	8.0	2.7 bar (40 psi))	660 mm Hg (26″ Hg	8.8 m H_2O (29 ft H_2O)
I/P 88	12.7 mm (0.5″)	23.2	15.0	2.4 bar (35 psi)		
I/P 89	15.88 mm (0.62″)	32.1	19.0	1.4 bar (20 psi)	510 mm Hg (20″ Hg)	7.0 m H2O (23 ft H2O)

ORDERING INFORMATION

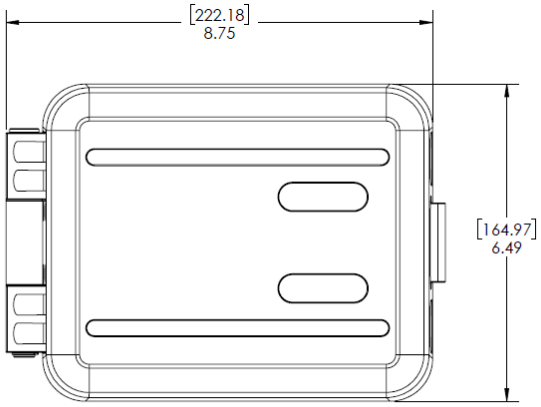
Description	Pump Tubing Size	Flow rates LPM (0.1 to 650 RPM)	Model Number	ATEX-Rated Model Number†
I/P® Rapid-Load Pump Head for Precision Pump Tubing	I/P 26	0.001 to 4	MFLX77603-20	MFLX77603-50
	I/P 73	0.001 to 8		
	I/P 82	0.002 to 13		
I/P® Rapid-Load Pump Head for High-Performance Precision Pump Tubing	I/P 70	0.001 to 8	MFLX77603-22	MFLX77603-52
	I/P 88	0.002 to 15		
	I/P 89	0.003 to 19		

† ATEX rated for: CE Ex II 3G Ex h IIC T6 Gc (NEC Class 1, Div 2, Groups A, B, C, & D, T6)

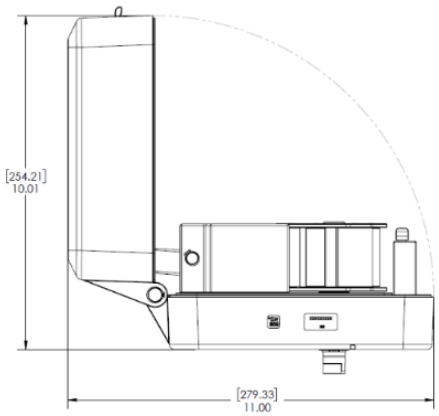
SPECIFICATIONS

Model Number	MFLX77603-20, MFLX77603-50		MFLX77603-22, MFLX77603-52
Performance Specifications			
Flow capacity	0.001 to 13 LPM (0.002 to 3.5 GPM)		0.001 to 19 LPM (0.02 to 4.5 GPM)
Max rpm	650		650
Number of rollers	3		3
Max pressure	2.7 bar (40 psi)		2.7 bar (40 psi)
Max vacuum	660 mm Hg (26" Hg)		660 mm Hg (26" Hg)
Max suction lift	8.8 m H_2O (29 ft H_2O)		8.8 m H_2O (29 ft H_2O)
Torque Specifications (pumping water @ 0 bar, 21°C			
Hard Durometer: PharMed® BPT, Tygon® A-60-F	Starting torque	273 N-cm (387 oz-in)	432 N-cm (612 oz-in)
	Running torque	133 N-cm (189 oz-in)	129 N-cm (183 oz-in)
Soft Durometer: C-FLEX®, Silicone	Starting torque	225 N-cm (320 oz-in)	529 N-cm (750 oz-in)
	Running torque	97 N-cm (138 oz-in)	112 N-cm (159 oz-in)
Physical Specifications			
Roller/rotor assembly materials	Stainless steel		
Occlusion bed materials	Glass-filled Nylon		
Housing	Hard-anodized machined aluminum		
Operating temperature	0°C to 40°C (32°F to 104°F)		
Shipping weight	4.8 kg (11 lb.)		

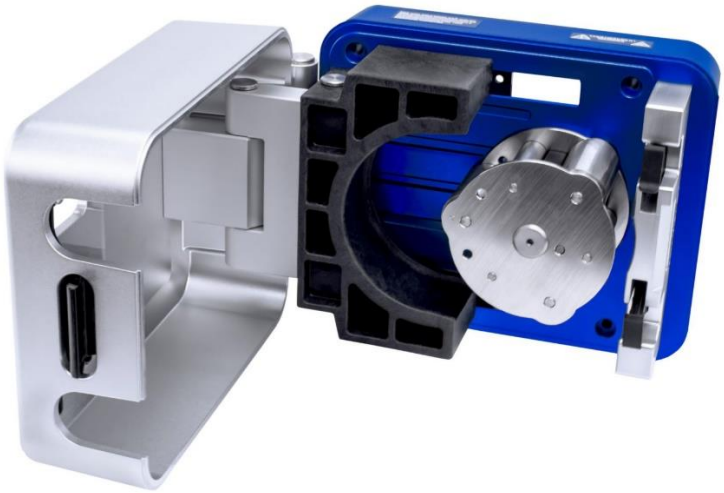
DIMENSIONS

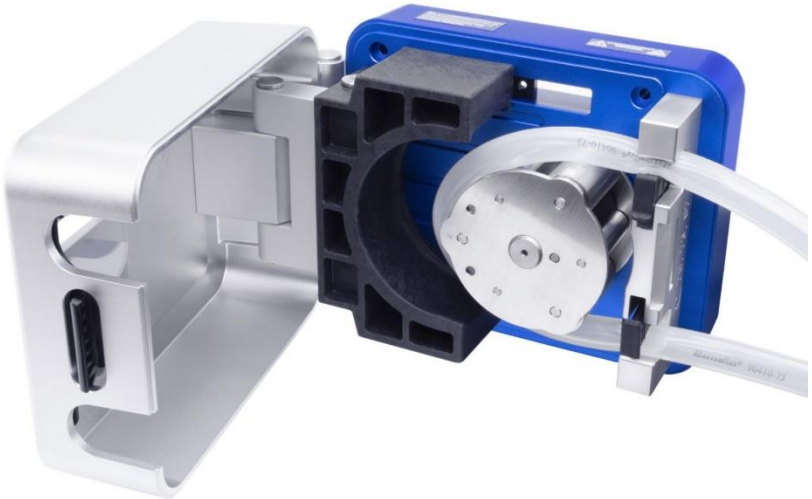


Front View



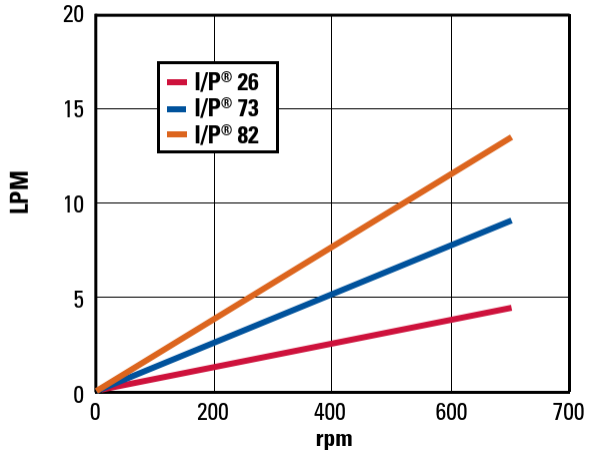
Top View - Door Open

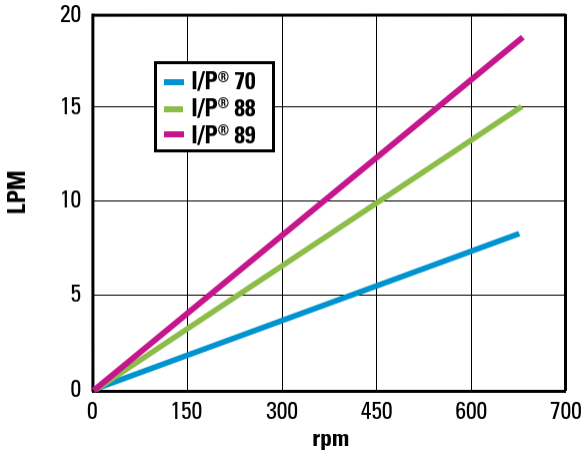




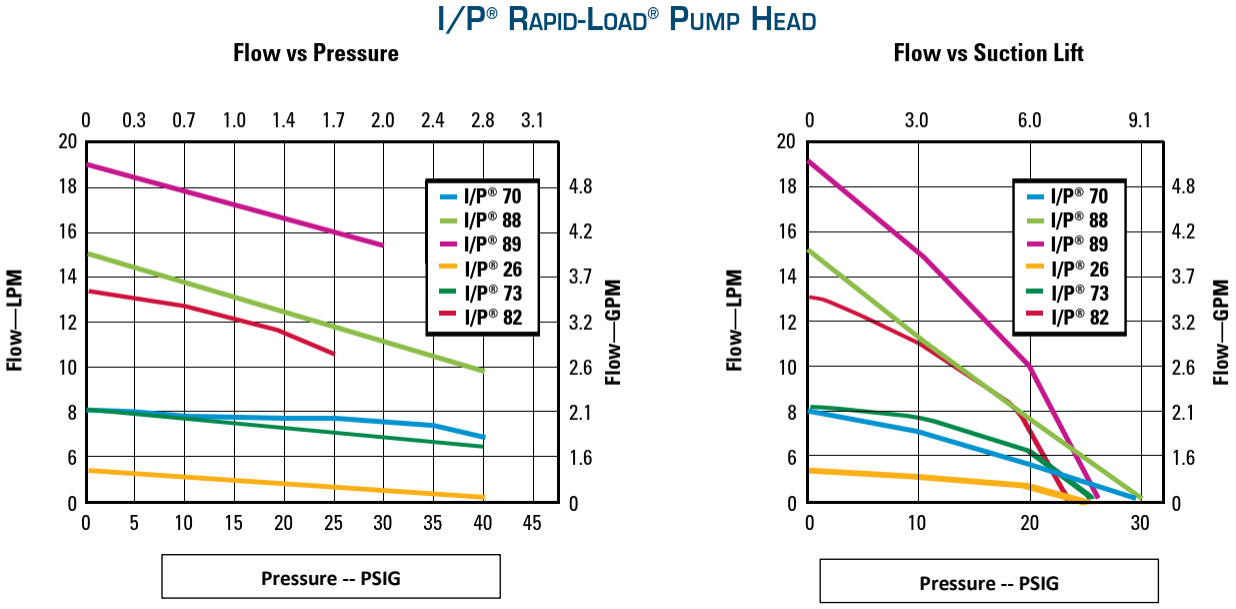
Performance Data – (all testing performed with water)

Flow versus Speed





Flow versus Pressure



I/P® Pump Tubing - Accept No Substitutes—Use Only Masterflex® Pump Tubing in Your Pumps

To ensure accurate flow rates and long tubing life, use only Masterflex tubing in your pumping applications. Our tubing is your best choice because it is specifically designed and manufactured for use in demanding peristaltic pump applications.

- Factory tested and optically inspected.
- 19 formulations to meet all demanding application requirements.
- Formulated and validated to comply with regulatory standards and classifications including USP, EP, EU Food, FDA, and 3A.
- Choose high performance for tubing longer life and higher pressure or viscosity applications.

Formulation	I/P® Precision Pump Tubing Sizes			
	Pack size	I/P 26	I/P 73	I/P 82
Puri-Flex®	7.6 m (25 ft)	MFLX96419-26	MFLX96419-73	MFLX96419-82
Silicone (platinum-cured)	7.6 m (25 ft)	MFLX96410-26	MFLX96410-73	MFLX96410-82
Silicone (peroxide-cured)	7.6 m (25 ft)	MFLX96400-26	MFLX96400-73	MFLX96400-82
BioPharm silicone	7.6 m (25 ft)	MFLX96420-26	MFLX96420-73	MFLX96420-82
BioPharm Plus silicone	7.6 m (25 ft)	MFLX96440-26	MFLX96440-73	MFLX96440-82
C-Flex® ULTRA	7.6 m (25 ft)	MFLX06434-26	MFLX06434-73	MFLX06434-82
C-Flex®	7.6 m (25 ft)	MFLX06424-26	MFLX06424-73	MFLX06424-82
PharMed® BPT	7.6 m (25 ft)	MFLX06508-26	MFLX06508-73	MFLX06508-82
PharmaPure®	7.6 m (25 ft)	MFLX06435-26	MFLX06435-73	MFLX06435-82
Chem-Durance® Bio	15.2 m (50 ft)	MFLX06442-26	MFLX06442-73	MFLX06442-82
Tygon® E-LFL	7.6 m (25 ft)	MFLX06440-26	MFLX06440-73	MFLX06440-82
Tygon® E-Food (B-44-4X)	15.2 m (50 ft)	MFLX06418-26	MFLX06418-73	MFLX06418-82
Tygon® E-Lab (E-3603)	15.2 m (50 ft)	MFLX06509-26	MFLX06509-73	MFLX06509-82
Versilon™ 2001	15.2 m (50 ft)	MFLX06475-26	MFLX06475-73	MFLX06475-82
Tygon® Fuel & Lubricant (F-4040-A)	15.2 m (50 ft)	—	MFLX06401-73	MFLX06401-82
Versilon™ (A-60-N)	15.2 m (50 ft)	MFLX06404-26	MFLX06404-73	MFLX06404-82
Tygon® (A-60-F)	15.2 m (50 ft)	MFLX06402-26	MFLX06402-73	MFLX06402-82
GORE® Series PCS	61.0 cm (24")	MFLX96211-26	MFLX96211-73	MFLX96211-82
GORE® Series PFL	61.0 cm (24")	MFLX96212-26	MFLX96212-73	MFLX96212-82
Formulation	I/P® High-Performance Precision Tubing Sizes			
	Pack size	I/P 70	I/P 88	I/P 89
Puri-Flex®	3.0 m (10 ft)	MFLX96419-70	MFLX96419-88	MFLX96419 -89
Silicone (platinum-cured)	3.0 m (10 ft)	MFLX96510-70	MFLX96510-88	MFLX96510-89
BioPharm silicone	3.0 m (10 ft)	MFLX96421-70	MFLX96421-88	MFLX96421-89
BioPharm Plus silicone	3.0 m (10 ft)	MFLX96441-70	MFLX96441-88	MFLX96441-89
C-Flex®	3.0 m (10 ft)	MFLX06424-70	MFLX06424-88	MFLX06424-89
PharMed® BPT	7.6 m (25 ft)	MFLX06508-70	MFLX06508-88	—
Chem-Durance® Bio	15.2 m (50 ft)	MFLX06442-70	MFLX06442-88	MFLX06442-89
Tygon® E-LFL	7.6 m (25 ft)	MFLX06440-70	MFLX06440-88	MFLX06440-89
Tygon® E-Food (B-44-4X)	15.2 m (50 ft)	MFLX06418-70	MFLX06418-88	MFLX06418-89
Tygon® E-Lab (E-3603)	15.2 m (50 ft)	MFLX06509-70	MFLX06509-88	MFLX06509-89
Versilon™ (A-60-N)	7.6 m (25 ft)	MFLX06404-70	MFLX06404-88	MFLX06404-89
Tygon® (A-60-F)	7.6 m (25 ft)	—	MFLX06402-88	MFLX06402-89
GORE® Series PCS	61.0 cm (24")	—	MFLX96211-88	MFLX96211-89
GORE® Series PFL	61.0 cm (24")	—	MFLX96212-88	MFLX96212-89

PUMPING VISCOUS FLUIDS

Pumping fluids with higher viscosity will have an impact on flow performance. To maximize the pumping efficiency when pumping viscous fluids follow the below steps:

1. Slow down the speed of your pump. Increasing the speed beyond a certain point for high viscosity will not have any effect on flow rate. The maximum efficient speed of the pump decreases as viscosity increases and tubing size decreases.
2. Choose a larger tubing size than required to pump water.
3. Select higher durometer tubing such as Chem-Durance® Bio, GORE® PCS and PFL, Norprene®, PharmaPure®, PharMed® BPT, and or Tygon® E-LFL. Performance will be better because the tubing returns to its original shape quickly after pump head occlusion.
4. Choose the high-performance pump head and tubing. The thicker tubing wall will allow the tubing to return to its original shape quicker than precision tubing which allows for greater suction force.
5. Select a tubing with a smooth bore to decrease frictional forces.
6. Position the pump as close to, or below the level of the inlet fluid to reduce suction lift (flooded suction)
7. Decrease the viscosity of the fluid. Heat the fluid if possible, to reduce viscosity.

PARTICULATES

Peristaltic pumps are generally well suited for pumping abrasive slurries due to their low shear and quick tubing changes compared to pumps with multiple wetted parts. However, steps should be taken to improve pump performance and life. Soft particles should have an ID less than 25% of the ID of the tubing. Hard particles should be even smaller in relation to the ID of the tubing (less than 5%). Maintaining these ratios will reduce the rate that the tubing is being worn from the inside.

COMPLETE SYSTEMS

Order components for complete system. Use only I/P® Masterflex® Pump Tubing for optimal performance.

- I/P® Pump Drive
- I/P® Rapid-Load® Pump Head (this brochure)
- I/P® Pump Tubing



Pump head pictured with Masterflex® I/P®
MasterSense™ Drive
Model MFLX77421-00