



PRECISION CHEMICAL METERING FOR THE TREATMENT OF MUNICIPAL WATER & WASTEWATER









Our ProSeries-M[®] line was meticulously engineered and designed to meet the very specific and critical needs associated with the treatment of Municipal Water and Wastewater. Each pumping unit is hand assembled by trained technicians and subjected to 24 hours of rigorous testing prior to shipment, ensuring delivery of a unit that's ready to go to work for you.

Due to the advanced technology of ProSeries-M[®] Metering Pumps, these units are sold only through our highly trained and knowledgeable network of Municipal Representatives.

For assistance in finding the Representative nearest you, or to inquire about product features and to ask questions, please contact our helpful and courteous in house sales staff.

TABLE OF CONTENTS

In: So

In the duration	
Introduction	••••••
General Information: Peristaltic Pumps	2
ProSeries-M [®] M-2 Peristaltic Pumps	3
ProSeries-M [®] M-3 Peristaltic Pumps	4
ProSeries-M [®] M-4 Peristaltic Pumps	5
Patents and Safety Features, Tubing and Chemical Resistance	6
ProSeries-M [®] MD-3 Hybrid Metering Pump	7
oSeries-M [®] MC-2 & MC-3 Diaphragm Pumps	8
EM-FEED [®] Engineered Skid Systems 10)
allation Photos11	
c-Pro® S1, S2, S3	
trasonic Flowmeters 12	
	Introduction General Information: Peristaltic Pumps ProSeries-M® M-2 Peristaltic Pumps ProSeries-M® M-3 Peristaltic Pumps ProSeries-M® M-4 Peristaltic Pumps Patents and Safety Features, Tubing and Chemical Resistance ProSeries-M® MD-3 Hybrid Metering Pump oSeries-M® MC-2 & MC-3 Diaphragm Pumps EM-FEED® Engineered Skid Systems10 allation Photos

PERISTALTIC METERING PUMPS

PROSERIES-M® METERING PUMPS are well suited to pumping a wide range of the aggressive and viscous chemicals used in water and wastewater treatment. The operator simply changes the pump tube assembly to the appropriate material for the chemical to be injected. This permits standardization to a single pump model for several different chemical applications.

The smooth, quiet, low velocity injection system eliminates the destructive forces that solenoid-type diaphragm pumps can have on piping systems. There is no need for pulsation dampeners or expensive piping systems.

The gentle squeezing action of the valve-less peristaltic pump head design, results in near continuous injection of chemical.

ProSeries-M[®] Peristaltic Metering Pumps are currently offered in three models, providing a wide range of feed rates and capabilities; M-2, M-3 and M-4.

These pages are designed to give you an overview of each model, as well as Blue-White's CHEM-FEED® Engineered Skid Systems, Chem-Pro® M Diaphragm Metering Pumps and Sonic-Pro® Ultrasonic Flowmeters.

PROSERIES-M® APPLICATIONS INCLUDE:

MUNICIPAL WATER TREATMENT MUNICIPAL WASTEWATER TREATMENT CHEMICAL INJECTION CHLORINATION CHLORAMINATION

PROSERIES-M® FEATURES INCLUDE:

- Gentle, quiet and smooth efficient pumping action.
- Peristaltic pump design does not have valves that can clog and require maintenance procedures.
- Self priming even against maximum line pressure. By-pass valves are not required.
- Cannot vapor lock or lose prime.
- Exclusive, Patented Peristaltic Pump Safety Switch – For Operator Safety, the pump only operates in maintenance mode while the front cover is removed.
- Patented Tube Failure Detection (TFD) system.



- Flow Verification Sensor (FVS) ready.
- Multiple signal inputs and outputs (4-20mA, etc.).
- Exclusive Patented Features and Multiple Patents Pending.
- Pressures to 125 PSI / 8.6 Bar.
- DC motor.
- Revolution count display & alarm.
- 5 Year Comprehensive Warranty.

	M-2	M-3	M-4
Flow Output Range	.01–17.2 GPH (.03–65.1 LPH)	.0002–33 GPH (.0007–126 LPH)	.0028-158.5 GPH (.01-600 LPH)
Turndown	200:1	10,0	00:1
Warranty		5 year	
Variable Speed DC Motor	Brush	Brus	hless
Maintenance Mode Safety Switch	YES	YES	YES
Motor reverse	YES	YES	YES
Tube Info Button	Timer	Revolution Co	ounter & Timer
Input: Remote Start/Stop	YES	YES	YES
Input: 4-20mA	YES	YES	YES
Input: Frequency (Pulsed)	YES	YES	YES
Output: 4-20mA	YES	YES	YES
Output: Pulse	NO	YES	YES
Proportional Dosing	NO	YES	YES
Password Protect (PIN)	NO	YES	YES
dustrial Ethernet (IP)(Optional)	YES	NO	NO
Profibus (Optional)	YES	NO	NO
lbus-TCP or Modbus (Optional)	YES	NO	NO
NSF 61 Listed	YES	YES	YES



Мо

Inc



ENGINEERING SPECIFICATIONS

Maximum working pressure (excluding pump tubes): 125 psig (8.6 bar) Note: see individual pump tube assembly maximum pressure ratings.

Maximum fluid temperature (excluding pump tubes): 3/8" OD x 1/4" ID tubing connections: 130° F (54° C) M/NPT connections: 185° F (85° C) All Flex-A-Prene® connections: 185° F (85° C)

Note: see individual pump tube assembly maximum temperature ratings. Maximum fluid viscosity: 12,000 Centipoise

Maximum suction lift: 30 ft. of water at sea level (14.7 atm psi)

Ambient operating temperature: 14°F to 115°F (-10°C to 46°C)

Ambient storage temperature: -40°F to 158°F (-40°C to 70°C) Motor: Brushed DC, 1/8 H.P.

Duty cycle: Continuous

Motor speed adjustment range 200:1: 0.5% - 100% motor speed (0.7 to 130 RPM)

Motor speed adjustment resolution: 0.1% increments

M-2 CAPACITY AND ORDERING GUIDELINES

FLEX-A-PI	RENE® M-2 T	UBE PUMP	S • Listed under NSF Std. 61 •	Meets FDA criteria for food • Exce	llent chemical resistance • CIP • SIP
GPH	FEED RATE LPH	ML/Min	MAX SPEED RPM	MAX PRESSURE PSI (bar)	MAX TEMPERATURE °F (°C)
.01 - 1.7	.03 - 6.5	1 - 108	130	125 (8.6)	185° (85°)
FLEX-A-PI	RENE® M-2 T		S • Listed under NSF Std. 61 •	Meets FDA criteria for food • Exce	llent chemical resistance • CIP • SIP
GPH	FEED RATE LPH	ML/Min	MAX SPEED RPM	MAX PRESSURE PSI (bar)	MAX TEMPERATURE °F (°C)
.02 - 4.5	.09 - 16.9	1.4 - 280	130	110 (7.6)	185° (85°)
.09 - 17.2	.33 - 65.1	5.4 - 1085	130	110 (7.6)	185° (85°)
FLEX-A-C	HEM [™] M-2 T	JBE PUMPS	• Meets FDA criteria f	or food • Excellent chem	ical resistance
GPH	FEED RATE LPH	ML/Min	MAX SPEED RPM	MAX PRESSURE PSI (bar)	MAX TEMPERATURE °F (°C)
.07 - 14.9	.28 - 56.2	5 - 937	130	50 (3.4)	130° (54°)
FLEX-A-TH	HANE [™] M-2 T	UBE PUMP	S • Meets FDA criteria	for food • Resistant to oi	ls, greases and fuels
GPH	FEED RATE LPH	ML/Min	MAX SPEED RPM	MAX PRESSURE PSI (bar)	MAX TEMPERATURE °F (°C)

.02 - 4.0 .08 - 15.2 1 - 253 130° (54°) 130 65 (4.5) .05 - 9.3 .17 - 35.2 3 - 587 130 65 (4.5) 130° (54°)

• The ProSeries-M® Pump's motor speed is linear over the entire 1% to 100% adjustment range

Output versus pressure is nearly linear in all models. Larger tubes exhibit greater losses

· For optimum tube life, specify the pump to operate at the lowest possible RPM and pressure

Display: Backlit LCD, UV resistant. Keypad: Nine button positive action tactile switch keypad.

Enclosure: NEMA 4X (IP66), Polyester powder coated aluminum.

Operating voltage:

115VAC/60Hz, 1ph (1.5 Amp Maximum) 230VAC/60Hz, 1ph (0.7 Amp Maximum) 220VAC/50Hz, 1ph (1.0 Amp Maximum) 240VAC/50Hz, 1ph (1.0 Amp Maximum)

Power cord options: 115V60Hz = NEMA 5/15 (USA) 230V60Hz = NEMA 6/15 (USÁ) 220V50Hz = CEE 7/VII (EU) 240V50Hz =AS 3112 (Australia/New Zealand)

Maximum overall dimensions:

7-1/2"W x 10-1/4"H x 14"D (19W x 26H x 35 6 D cm) Product weight: 28.4 lb. (12.9 Kg) Approximate shipping wt: 35 lb. (15.9 Kg)

CONTROL

200:1 turndown ratio.

- AN M-2 EXCLUSIVE: Firmware is field upgradable; always stay up-to-date with latest software.
- Control system designed to permit connection to SCADA systems and other remote controllers for chemical dosing control.
- EXCLUSIVE TO M-2: Optional Communication Protocols: Profibus DPV1, Modbus RTU, Modbus-TCP, and EtherNet/IP.
- Optional communications: Start stop, prime, control, lock and unlock clear alarm, run mode set speed etc.

INPUT

4-20mA and pulse inputs for remote external speed control, powered by either: powered 6-24VDC, or non-powered dry contact closure for remote start/stop.

OUTPUT

- One 250V/3A relay to monitor TFD (Tube Failure Detection) System) and FVS (Flow Verification System).
- 4-20mA analog signal scalable to the motor speed.

DESIGNED FOR SMALL TO MID-SIZE WATER AND WASTEWATER TREATMENT SYSTEMS

ProSeries-M[•]

THE FEATURE ENHANCED PROSERIES-M® M-2 **PERISTALTIC METERING PUMP** is designed for use in small to mid-size municipal water and wastewater treatment systems. The pump includes many of the features and options seen in far more expensive pump models, designed for large municipalities.

Standard M-2 control features include; an easy to use intelligent control systems design. It permits connection to SCADA systems and other remote controllers, for chemical dosing control via either a 4-20mA signal, a high speed digital pulse input, or a slow pulse for batching type applications.

The M-2 pump head roller assembly features two CNC machined squeeze rollers and two alignment rollers for optimum squeeze and tube life.

EXCLUSIVE TO M-2. Optional advanced SCADA communications command and status capabilities include: start, stop, prime, and set point speed, touchpad locking and unlocking, motor status, pump head cover status, tube failure detection status, alarm reset, running hours reset, and many others.

The Firmware is field upgradable. So the plant can always stay up-to-date with the latest software. This is an M-2 exclusive.

ProSeries-M[®]

DESIGNED FOR PRECISION TREATMENT OF DRINKING WATER AND WASTEWATER

THE PROSERIES-M® M-3 IS BUILT RUGGED

enough to handle the most demanding water and wastewater treatment environments. The M-3 has feed rates from .0002 to 33.3 GPH / .0007 to 126 LPH, and is ideally suited for use in Municipal Treatment operations.

The M-3 provides quiet, smooth, lowvelocity pumping action while handling many aggressive and/or viscous chemicals.

The ProSeries-M[®] M-3 requires a minimal amount of regular maintenance. The only regularly required maintenance is periodic changing of the pump tube assembly.

All Blue-White® Pumps, including the M-3, are equipped with our exclusive, patented TFD Tube Failure Detection System -built

right in (U.S. Patents 7,001,153 and 7,284,964). Find out more about the TFD system and other exclusive features on page six.

Thoughtfully Designed and Carefully Engineered.

CONTROL

Hardwired.

10,000:1 Turndown Ratio with high resolution motor speed adjustment - Highest Turndown Ratio in the Industry!

INPUT

4-20mA, 0-10Vdc, and Pulse inputs for remote external or batch control and 0-30 VDC/ contact closure remote start/stop.

OUTPUT

Scalable 4-20mA or Pulse, one 250V/3A relay and three 115V/1A contact closures assignable to monitor various pump functions including: TFD (Tube Failure Detection), Optional FVS (Flow Verification Sensor), revolution counter, remote/local, forward/ reverse, input signals, output signals, motor on, motor fault, operating mode setting, and more.

M-3 CAPACITY AND ORDERING GUIDELINES

FLEX-A-PRENE® M-3 TUBE PUMPS

Listed under NSF Std. 61 • Meets FDA criteria for food • FEED RATE			Excellent chemi MAX SPEED	cal resistance • CIP	· SIP	
	GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)
	.0002 - 2.10	.0007 - 7.92	.0132 - 132	125	125 (8.6)	185° (85°)
	.025 - 25.3	.0096 - 96.0	.1596 - 1596	125	125 (8.6)	185° (85°)
	.0033 - 33.3	.0126 - 126	.2100 - 2100	125	125 (8.6)	185° (85°)

FLEX-A-PRENE® M-3 LOW PRESSURE TUBE PUMPS • Listed under NSF Std. 61

Meets FDA criteria	lot lood • Excellen	t chemical resistan	ice • Extra long	life at low pressures	
	FEED RATE		MAX SPEED	MAX PRESSURE	MAX TEMP
GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)
.0033 - 33.3	.0126 - 126	.2100 - 2100	125	30 (2.1)	185° (85°)

FLEX-A	-PRENE®	M-3 TU	JBE PUMF	S

Listed under NSF S	td. 61 • Meets FDA o	criteria for food	Excellent chemic	cal resistance • CIF	• SIP
	FEED RATE		MAX SPEED	MAX PRESSUR	E MAX TEMP
GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)
.0005 - 4.8	.0018 - 18.0	.03 - 300	125	110 (7.6)	185° (85°)
.0019 - 19.0	.0072 - 72.0	.12 - 1200	125	110 (7.6)	185° (85°)



ENGINEERING SPECIFICATIONS

Maximum working pressure (excluding pump tubes): 125 psig (8.6 bar)

Note: see individual pump tube assembly maximum pressure ratings. Maximum fluid temperature (excluding pump tubes): 3/8" OD x 1/4" ID tubing connections: 130° F (54° C) M/NPT connections: 185° F (85° C) All Flex-A-Prene® connections: 185° F (85° C) Note: see individual pump tube assembly maximum temperature ratings.

Maximum fluid viscosity: 12,000 Centipoise Maximum suction lift:

30 ft. of water, 0 psig (4.5m, 0 bar) Ambient operating temperature: 14°F to 115°F (-10°C to 46°C)

Ambient storage temperature: -40°F to 158°F (-40°C to 70°C)

Motor speed adjustment range: 10,000:1 (0.001% - 100% motor speed) Motor speed adjustment resolution:

0.1% increments > 10% motor speed 0.01% increments > 1% motor speed and < 10% 0.001% increments < 1% motor speed Display: 3 color VGA backlit LCD, UV resistant. **Display resolution:**

0.0. > 10% motor speed 0.00 > 1% motor speed and < 10% 0.000 < 1% motor speed

Display languages: English, Spanish, French or German selectable

Keypad: Eleven button positive action tactile switch keypad.

Security: Programmable 4-digit password. Enclosure: NEMA 4X (IP66), Polyester powder coated aluminum.

Operating voltage: 96 to 264VAC-50/60Hz, 220 VA Power cord options:

115V60Hz = NEMA 5/15 (USA) 230V60Hz = NEMA 6/15 (USÁ) 220V50Hz = CEE 7/VII (EU) 240V50Hz =AS 3112 (Australia/New Zealand)

Maximum overall dimensions: 8-1/8"W x 10-3/4"H x 15-1/4"D (20.6W x 27.3H x 38.9D cm)

Approximate shipping wt: 33 lb. (15.0 Kg)

FLEX-A-CHEM™ M-3 TUBE PUMPS

Listed under NSF St	d. 61 • Meets FDA	criteria for food •	Superior chemic	al resistance	MAY TEMP
GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)
.0014 - 14.5	.0055 - 55.1	.0920 - 920	125	50 (3.4)	130° (54°)
.0028 - 28.5	.0108 - 108	.1800 - 1800	125	50 (3.4)	130° (54°)

FI FY-A-THANE" M-3 TURE DUMDS

	Meets FDA criteria for food • Resistant to oils, greases and fuels							
FEED RATE				MAX SPEED	MAX PRESSURE	MAX TEMP		
	GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)		
	.0004 - 4.60	.0017 - 17.4	.0290 - 290	125	65 (4.5)	130° (54°)		
	.0010 - 10.1	.0038 - 38.4	.0637 - 637	125	65 (4.5)	130° (54°)		
	.0024 - 24.9	.0094 - 94.2	.1570 - 1570	125	65 (4.5)	130° (54°)		
	.0028 - 28.5	.0108 - 108	.1800 - 1800	125	65 (4.5)	130° (54°)		







NSF

Standard 61

ENGINEERING SPECIFICATIONS

Maximum working pressure (excluding pump tubes): 125 psig (8.6 bar) Note: see individual pump tube assembly maximum pressure ratings.

Note: see individual pump tube assembly maximum pressure ratings. **Maximum fluid temperature (excluding pump tubes):** 3/8" OD x 1/4" ID tubing connections: 130° F (54° C) M/NPT connections: 185° F (85° C) Note: see individual pump tube assembly maximum temperature ratings.

Maximum fluid viscosity: 12,000 Centipoise

Maximum suction lift: 30 ft. of water, 0 psig (4.5m, 0 bar) Ambient operating temperature: 14°F to 115°F (-10°C to 46°C)

Ambient storage temperature: -40°F to 158°F (-40°C to 70°C)

Motor speed adjustment range: 10,000:1 (0.001% - 100% motor speed) Motor speed adjustment resolution:

0.1% increments > 10% motor speed 0.01% increments > 1% motor speed and < 10% 0.001% increments < 1% motor speed Display: 3 color VGA backlit LCD, UV resistant. **Display resolution:**

0.0. > 10% motor speed 0.00 > 1% motor speed and < 10% 0.000 < 1% motor speed **Display languages:** English, Spanish, French or German selectable.

Keypad: Eleven button positive action tactile switch keypad.

Security: Programmable 4-digit password. Enclosure: NEMA 4X (IP66), Polyester powder coated aluminum.

Operating voltage: 96 to 264VAC-50/60Hz, 350 VA

Power cord options: 115V60Hz = NEMA 5/15 (USA)

230V60Hz = NEMA 6/15 (USÁ) 220V50Hz = CEE 7/VII (EU) 240V50Hz = AS 3112 (Australia/New Zealand) Maximum overall dimensions: 12-1/8"W x 14-1/4"H x 18-5/8"D

(30.8W x 36.1H x 47.3D cm) Approximate shipping wt: 58 lb. (15.0 Kg)

THE HIGH VOLUME PROSERIES-M[®] PERISTALTIC METERING PUMP

WITH HIGH VOLUME FEED FROM .0028 TO 158.5GPH and unparalleled features, the ProSeries-M[®] M-4 provides precision treatment of Municipal Water and Wastewater.

The smooth, quiet, low velocity injection system eliminates the destructive forces that solenoid-type diaphragm pumps can have on piping systems. This removes the need for pulsation dampeners and expensive piping system repairs.

ProSeries-M[®] M-4 has CNC machined rollers and two alignment rollers for optimum squeeze and tube life. The single piece heavy duty rotor means no flexing and increased accuracy, with no

metal springs or hinges to corrode. Operators can set the pump to inject at maximum pressure in either direction, clockwise or counter clockwise.

Thoughtfully Engineered, Versatile, Well Priced, Reasonable Lead Times.

CONTROL

Hardwired

10,000:1 Turndown Ratio with high resolution motor speed adjustment – Highest Turndown Ratio in the Industry!

INPUT 4-20m

 4-20mA, 0-10Vdc, and Pulse inputs for remote external or batch control and 0-30 VDC/ contact closure remote start/stop.

OUTPUT

Scalable 4-20mA or Pulse, one 250V/3A relay and three 115V/1A contact closures assignable to monitor various pump functions including: TFD, Optional FVS (Flow Verification Sensor), revolution counter, remote/local, forward/reverse, input signals, output signals, motor on, motor fault, operating mode setting, and more.

M-4 CAPACITY AND ORDERING GUIDELINES

FLEX-A-PRENE® M-4 TUBE PUMPS

Listed under NSF St	d. 61 • Meets FDA	criteria for food •	Excellent chemical resistance • CIP • SIP			
GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)	
.0028 - 28.5	.0108 - 108	.180 - 1800	125	125 (8.6)	185° (85°)	
.0044 - 44.4	.0168 - 168	.280 - 2800	125	100 (6.9)	185° (85°)	
.0050 - 50.7	.0192 - 192	.320 - 3200	125	80 (5.5)	185° (85°)	
.0054 - 54.0	.0204 - 204	.340 - 3400	125	100 (6.9)	185° (85°)	
.010 - 100.0	.0378 - 378	.630 - 6300	125	50 (3.4)	185° (85°)	
015 - 158 5	0600 - 600	100 - 10000	125	30 (21)	185° (85°)	

FLEX-A-PRENE® M-4 LOW PRESSURE TUBE PUMPS • Listed under NSF Std. 61 Meets FDA criteria for food • Excellent chemical resistance • Extra long life at low pressures

Meets FDA criteria for food • Excellent chemical resistance • Extra long life at low pressures							
FEED RATE				MAX SPEED	MAX PRESSUR	E MAX TEMP	
	GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)	
	.0050 - 50.7	.0192 - 192	.320 - 3200	125	30 (2.1)	185° (85°)	
	.011 - 111.0	.0420 - 420	.700 - 7000	125	30 (2.1)	185° (85°)	

FLEX-A-CHEM" M-4 TUBE PUMPS

td. 61 • Meets FDA	criteria for food •	Superior chemic	al resistance	
FEED RATE		MAX SPEED	MAX PRESSUR	E MAX TEMP
LPH	ML/Min	RPM	PSI (bar)	°F (°C)
.0078 - 78.0	.130 - 1300	125	30 (2.1)	130° (54°)
.0162 - 162	.270 - 2700	125	30 (2.1)	130° (54°)
.0192 - 192	.320 - 3200	125	30 (2.1)	130° (54°)
	td. 61 • Meets FDA FEED RATE LPH .0078 - 78.0 .0162 - 162 .0192 - 192	Meters FDA criteria for food FEED RATE LPH ML/Min .0078 - 78.0 .130 - 1300 .0162 - 162 .270 - 2700 .0192 - 192 .320 - 3200	Meets FDA criteria for food Superior chemic FEED RATE MAX SPEED LPH ML/Min RPM .0078 - 78.0 .130 - 1300 125 .0162 - 162 .270 - 2700 125 .0192 - 192 .320 - 3200 125	Meets FDA criteria for food Superior chemical resistance MAX SPEED MAX PRESSURI ML/Min Superior chemical resistance MAX SPEED MAX PRESSURI PSI (bar) .0078 - 78.0 .130 - 1300 125 30 (2.1) .0162 - 162 .270 - 2700 125 30 (2.1) .0192 - 192 .320 - 3200 125 30 (2.1)

FLEX-A-THANE" M-4 TUBE PUMPS

leets FDA criteria for food • Resistant to oils, greases and fuels							
FEED RATE			MAX SPEED	MAX PRESSURE	MAX TEMP		
GPH	LPH	ML/Min	RPM	PSI (bar)	°F (°C)		
.0039 - 39.6	.0150 - 150	.250 - 2500	125	65 (4.5)	130° (54°)		
0055 - 55.5	.0210 - 210	.350 - 3500	125	65 (4.5)	130° (54°)		
.010 - 100.0	.0378 - 378	.630 - 6300	125	65 (4.5)	130° (54°)		

ProSeries-M PUMPTUBE

Multi-Tube Technology Heavy-Duty Peristaltic Pump Tubing **Dual Tube Technology for Precision Chemical Metering and Long Service** Life, Even at High Pressures

Blue-White's Innovative Multi-Tubes are engineered and designed to provide precision metering of chemical into critical treatment systems.

These uniquely engineered pump tubes are specially designed to provide optimum performance while operating at much higher pressures than conventional single tube designs. At the same time, the Multi-Tube design delivers unmatched tube life of up to four times longer than conventional single tube designs. Because of the extended life of the Multi-Tube, pump maintenance and related costs such as labor and parts expense, are reduced.

For convenience when reordering tubes, Multi-Tube designs feature clamp-less overmolded tube fittings with permanently printed model numbers that are clearly visible and can be viewed through the pump head cover, even while the pump is running. This design enables quick and convenient parts ordering.

The clamp-less overmolded tube fitting is available with multiple connection fitting types, including: 1/2" M/NPT, barb fitting and 3/8" tube compression, tri-clamp and quick disconnect. Multiple U.S. and International patents are pending.

Flex-A-Prene®, Flex-A-Thane[™] and Flex-A-Chem[™] pump tube will retrofit ProSeries-M® M-2 and M-3 Model pumps already in service.

The Multi-Tube overmolded tubes are available for use on Blue-White's ProSeries-M® and ProSeries® Peristaltic **Chemical Metering Pumps.**





Blue-White's exclusive patented Tube Failure Detection system, no one comes close to this breakthrough technology (U.S. patent: 7,001,153 and 7,284,964). In fact, the TFD may be the most important patent ever awarded for peristaltic metering pumps. The TFD System will detect a wide range of conductive chemicals with no false triggering. If the TFD senses tube failure, the pump will automatically shut off and energize a relay or switch. This permits communication with external equipment, such as a back-up pump or alarm. Simple, efficient and BUILT-IN to every ProSeries-M® Pump.



ProSeries-M TUBING AND CHEMICAL RESISTANCE CHART

Available Tubing Options for ProSeries-M® Metering Pumps are: Flex-A-Prene®, Flex-A-Chem®, and Flex-A-Thane®.

FLEX-A-PRENE® TUBING

Meets FDA criteria for food • Excellent chemical resistance

Alcohol general Aluminum Sulfate (Alum) Ammonium chloride Ammonium hydroxide Benzyl alcohol Bleach Brine solutions Calcium hydroxide Calcium hypochlorite 20% Citric Acid

Ethylene glycol Ferric chloride Ferric nitrate Ferric sulfate Ferrous chloride - 43% in water Ferrous sulfate Fluosilic Acid (up to 25%) Formic acid Glucose Hydrochloric acid 33%

FLEX-A-CHEM™ TUBING: Ultra smooth plasticizer-free bore (inner Linder) Meets FDA criteria for food • Superior chemical resistance

Salts

Ketones

Alcohols:

Applications

Isobutyl Alcohol

Battery acid filling

Sensitive fluid transfer

Ink and solvent production

Specialty chemical production / processing

Ferrous chloride (up to 40%) Fluoboric acid (up to 48%) Fluosilicic acid (up to 25%) Hydrofluoric acid (up to 48%) Nitric Acid (up to 71%) Phosphoric acid (up to 85%) Potassium hypochlorite (up to 70%) Sodium phosphate (up to 30%) Sulfuric acid (up to 98%) Bases

Hydrogen peroxide Hypochlorous acid lodine Magnesium chloride Magnesium sulfate Phosphoric acid **Plating solutions** Polvaluminum Chloride (PAC) Potassium hydroxide

Hydrocyanic acid

Propylene glycol Sodium hydroxide 50% Sodium bisulfite Sodium chlorite 12% Sodium hypochlorite 12.5% Sodium sulfide Sulfuric acid (up to 50%) Tannic acid

FLEX-A-THANE" TUBING

Meets FDA criteria for food • Resistant to oils, greases and fuels **Tygothane®** Cvclohexane **Diesel Fuel** Fatty acids Gasoline Heptane Hexane Kerosene Lard **Mineral spirits**

Soap solutions Turpentine Oils. ASTM reference No.1.2.3 Castor Coconut Fuel Linseed Lubricating Mineral



ProSeries-M

MD-3

ENGINEERING SPECIFICATIONS

Maximum flow-rate: 58 GPH (219.6 LPH) Maximum working pressure (excluding pump tubes):

145 psig (10 bar) Maximum fluid temperature (excluding pump tubes):

PVDF connections: 185°F (85°C) Maximum fluid viscosity: 1,000 Centipoise

Maximum suction lift: 23 ft. Water, 0 psig (7 m, 0 bar) Ambient operating temperature: 14°F to 115°F (-10°C to 46°C)

Motor speed adjustment range:

2,000:1 (0.05% - 100% motor speed) Motor speed adjustment resolution: 0.1% increments > 10% motor speed 0.01% increments > 1% motor speed and < 10% 0.001% increments < 1% motor speed

Display: 3 color VGA backlit LCD, UV resistant. **Display resolution:**

0.0. > 10% motor speed 0.00 > 1% motor speed and < 10% 0.000 < 1% motor speed

MD-3 CAPACITY (PRESSURE VS. OUTPUT)

Display languages: English, Spanish, French or German selectable.

Keypad: Eleven button positive action tactile switch keypad.

Security: Programmable 4-digit password. Enclosure: NEMA 4X (IP66), Polyester powder coated aluminum.

Operating voltage: 96 to 264VAC-50/60Hz, 220 VA

Power cord options: 115V60Hz = NEMA 5/15 (USA) 230V60Hz = NEMA 6/15 (USA) 220V50Hz = CEE 7/VII (EU) 240V50Hz = AS 3112 (Australia/New Zealand) 230V50HZ, power cord BS 1363/A plug (UK) Maximum overall dimensions: 16-1/8"W x 15-1/4"H x 15-5/16"D

(40.9W x 38.7H x 38.9D cm) Approximate shipping wt: 51 lb. (23.13 Kg)

HYBRID DIAPHRAGM METERING PUMP

ProSeries-M[•]

PROSERIES-M® MD-3 HYBRID CHEMICAL METERING PUMPS provide Precision Chemical Metering for the treatment of Municipal Water and Wastewater.

ProSeries-M® MD-3 is expertly engineered to provide smooth flow that mimics the best performance traits of peristaltic pumps, particularly at low feeds. The Dual Diaphragm configuration of the MD-3

means that when the first diaphragm is in the suction phase, the second diaphragm is in the discharge phase.

The double diaphragms allow for fluid to be pumped at a near continuous flow, preventing two of the problems most often associated with diaphragm pumps: gas build up and loss of prime. The MD-3 Pump is equipped with sonic welded manifolds to prevent chemical leaks. The pump has 2000:1 turndown and provides smooth chemical dosing with no pulsation dampener required.

The Patent Pending design of the MD-3 is 50% more energy efficient than similar units currently on the market, and the drop-in-place design, along with conveniently built-in controls make installation and set-up fast and efficient.

HIGHLIGHTS

- The best turndown in the industry at 2000:1.
- Flow rate: .03-58 GPH (.11-219.6 LPH).
 - Maximum working pressure: 145 pslg (10 bar).
- Smooth chemical dosing, no pulsation dampener needed.
- A single model number will handle all your needs.
- Equipped with Blue-White's exclusive DiaFlex® diaphragms.
- Multiple U.S. and international Patents Pending.

MOTOR SPEED FEED RATE AT 0 PSIG		FEED	FEED RATE AT 60 PSIG		FEED	FEED RATE AT 90 PSIG		FEED RATE AT 145 PSIG				
%	RPM	ML/Min	GPH	RPM	ML/Min	GPH	RPM	ML/Min	GPH	RPM	ML/Min	GPH
0.05	0.11	1.6	0.03	0.11	1.5	0.02	0.11	1.5	0.02	0.11	1.5	0.02
1	1.3	35	0.6	1.3	25	0.4	1.3	24.3	0.4	1.3	25.2	0.4
10	19	363	5.8	19	360	5.7	19	343	5.4	19	339	5.4
20	38	714	11.3	38	704	11.2	38	690	10.9	38	664	10.5
40	75	1464	23.2	75	1409	22.3	75	1423	22.6	75	1314	20.8
60	113	2165	34.3	113	2141	33.9	113	2050	32.5	113	1964	31.1
80	151	2925	46.4	151	2839	45.0	151	2785	44.1	151	2640	41.8
100	190	3660	58.0	190	3430	54.4	190	3320	52.6	190	3024	47.9

ProSeries-M MC-2 MC-3

DIAPHRAGM CHEMICAL METERING PUMPS

BLUE-WHITE'S CHEM-PRO® MC-2 AND MC-3 Diaphragm Chemical Metering Pumps, are specifically designed to meet the rigorous demands of municipal water and wastewater treatment applications.

These units are well suited for use with the often aggressive and viscous chemicals used in these applications.

With its tough pump head and PVDF Diaflex® Diaphragm, the Chem-Pro® can handle high pressure applications – up to 175 PSI.

Chem-Pro® M's carefully engineered design begins with a substantial control pad that's easy to use and highly intuitive. A protective snap-on polycarbonate cover protects the LCD control pad from both UV and the elements.

Chem-Pro[®] M is equipped with a superior PVDF pump head with large double ball ceramic valves.

A large single piece Junction Box provides easy access to the terminal block connectors, and includes additional ports for external wiring, such as; Profibus, Ethernet, Etc.

Some additional Chem-Pro® M features and benefits include: A remote Start/Stop function; feed rate resolution from 1% to 0.1%.; and a rugged Variable Speed Drive.



MICHEM-PRO'M

ProSeries-I

- Feed Rates to 40GPH/153 LPH.
- System Pressures to 175 PSI/12 bar.
- Diaphragm Failure Detection.
- PVDF/Ceramic Head Components.
- Quiet variable Speed Motor.
- Full Stroke Every Time Avoids Vapor Lock.
- NEMA 4X (IP 66) Washdown.
- 3 Year Warranty.



The Chem-Pro® M pumps are fitted with Blue-White's exclusive DiaFlex® single layer PVDF diaphragm. Manufactured 100% in-house, this single piece, longer lasting diaphragm design does not consist of multiple layers like traditional diaphragms. DiaFlex® exhibits zero breakdown or delamination, reducing field maintenance and downtime. The exclusive, efficient, patent pending design is available in four sizes, including the Micro-Feed diaphragm.

 Pump head: PVDF head and diaphragm and FKM or EP o-rings, are the only wetted material in the Chem-Pro® pump head. This reduces issues of chemical compatibility.
Manufactured 100% in-house exclusively for use on Chem-Pro® Diaphragm Metering Pumps.

IP66

E



APPLICATIONS

- Chemical Metering
- Wastewater Treatment
- Municipal Water Treatment
- Boiler Treatment

FEATURES

Operator friendly digital controls with backlit LCD display and DFD alarm display.

Acid Injection

Eluoridation

Cooling Tower Treatment

- Signal inputs include: 4-20mA, pulse inputs, and Remote start/stop.
- Signal outputs include: Relay (3 amp), motor running contact, 4-20mA.
- Large PVDF, Ceramic, double ball check valves without metal springs.
- Backlit LCD displays output volume, motor % speed, input signal values, service and alarm status.
- Includes Diaphragm Failure Detection (DFD) system.
- Compatible with Blue-White's Flow Verification Sensor (FVS) system.
- Alarm relay monitors the DFD system and the FVS system.
- SCADA ready dry contact relay closes while motor is energized.
- NEMA4X (IP66) wash-down, chemically resistant powder coated enclosure.
- Patent pending DiaFlex® PVDF single-layer Diaphragm.
- Field up-gradeable firmware.
- Terminal block connectors inside junction box.
- UV protective LCD snap-on cover.
- Profibus, Ethernet, Modbus TCP, and Modbus RTU options available.

ENGINEERING SPECIFICATIONS

Maximum working pressure: 175 psig (12 bar) (model specific) Maximum fluid temperature: 130° F (54° C) Maximum fluid viscosity: 1,000 Centipoise Maximum suction lift: 15 ft. Water, 0 psig (4.5 m, 0 bar)

Ambient operating temperature: 14°F to 115°F (-10°C to 46°C) Ambient storage temperature:

-40°F to 158°F (-40 C to 70°C) Motor: Brushed DC, 1/8 H.P.

Duty cycle: Continuous

Output adjustment range: 0.5-100% in 0.1% increments Display: Backlit LCD, UV resistant.

Keypad: Positive action tactile switch keypad. Enclosure: NEMA 4X (IP66), Powder coated aluminum.

Operating voltage: 115VAC/60Hz, 1ph (1.5Amp Maximum) 230VAC/60Hz, 1ph (0.7 Amp Maximum) 220VAC/50Hz, 1ph (1.0 Amp Maximum) 240VAC/50Hz, 1ph (1.0 Amp Maximum) 240VAC/50Hz, 1ph (1.0 Amp Maximum)

Power cord options: 115V60Hz = NEMA 5/15 (USA) 230V60Hz = NEMA 6/15 (USA) 220V50Hz = CEE 7/VII (EU) 240V50Hz =AS 3112 (Australia/New Zealand)

 $\begin{array}{l} \mbox{Maximum overall dimensions:} \\ \mbox{MC-2 models: } 11-3/4"W \times 7-3/4"H \times 10-3/4"D \\ \mbox{MC-3 models: } 13-1/8"W \times 9"H \times 10-3/4"D \\ \end{array}$

Approximate shipping wt: MC-2 models: 24 lb. (10.9 Kg) MC-3 models: 29 lb. (13.1 Kg)

MATERIALS OF CONSTRUCTION WETTED COMPONENTS:

ProSeries-M

-

Pump Head Assembly: **PVDF** Pump Head. Adapter Connections. **PVDF** Prime/Degassing Valve. PVDF Valve Cartridges.... PVDF Valve Balls Ceramic Valve Ball Seats TFE/P TFE/P (optional EP) Static Seals...

Diaphragm. PVDF Injection / Back-flow Check valve: PVDF Body & insert Check Ball...

Ceramic Hastelloy C-276 TFE/P (optional EP)

Foot Valve I Strainer: Body & Adapter

Douy & Adupter	
Check Ball	Ceramic
Spring	Hastelloy C-276
0-ring seals	TFE/P (optional EP)
Filter screen	

Polypropylene Clear PVC

PV/DE

Suction Tubing:.....

Spring. 0-ring seals

Discharge Tubing: 3/4" x 1/2" Tube connections .. Not supplied 1/4" x 3/8" Tube connections .. Natural Polyethylene (LLDPE)

Connection Type Options: 1/2" Male NPT 1/2" Female /NPT 3/4"OD x 1/2"ID TUBE 3/8"OD x 1/4"ID TUBE

NON-WETTED COMPONENTS:

Enclosure:

413 Aluminum (Polyester powder coated) Pump Head Cover:

316 Stainless Steel **Cover Screws:**

300 Series Stainless Steel **DFD System Sensor pins:**

Hastelloy C-276

Power Cord: 3 conductor, SJTW-A Water-resistant **Tube Installation Tool: GF** Nylon

Mounting Brackets and Hardware: 316 Series Stainless Steel

MC-2 CAPACITY AND ORDERING GUIDELINES

North State	GPH	FEED RATE LPH	ML/Min	MAX PRESSURE PSI (bar)
	.01 - 2.3	.05 - 9.0	0.8 - 150	150 (10)
	.02 - 4.0	.08 - 15.0	1.3 - 250	150 (10)
	.04 - 8.2	.16 - 31	2.6 - 520	175 (12)
	.06 - 12	.23 - 45	3.8 - 750	175 (12)
	.11 - 21	.40 - 78	6.6 - 1300	175 (12)

MC-3 CAPACITY AND ORDERING GUIDELINES

GPH	FEED RATE	ML/Min	MAX PRESSURE PSI (bar)
.13 - 25	.48 - 96	8.0 - 1600	150 (10.3)
.20 - 40	.77 - 153	12.8 - 2550	100 (6.8)

CHEM-FEED ENGINEERED SKID SYSTEMS

SINGLE AND DUAL PUMP SKIDS

THE CHEM-FEED® ENGINEERED SKID SYSTEM was designed and engineered using solid modeling tools for superior guality and easy component maintenance. Custom engineered universal mounting blocks, and pre-assembled component assemblies are easily stocked and field replaceable into pre-machined mounting slots. Each System is rigorously factory tested, and the strong, lightweight systems can be either floor or wall mounted for easy operator access.

CHEM-FEED SKID SYSTEM APPLICATIONS

MUNICIPAL WATER TREATMENT MUNICIPAL WASTEWATER TREATMENT CHEMICAL METERING CHLORINATION FLUORIDATION ALUM

SODIUM BISULFITE / BISULFATE HYDROCHLORIC ACID POLYMERS CAUSTICS FLOCCULANTS

CHEM-FEED SKID SYSTEM FEATURES

- Simply drop it in place and make your connections.
- Includes pressure switch option.
- Drip containment tray, removable for easy cleaning.
- Wall mountable with optional wall mount bracket.
- Efficient, small footprint design.
- Proven components, vented ball valves, PRV (pressure)
 - relief valve), gauge guards, and metal free check valves: • Pressure relief valve (PRV) - Protects the system from over pressurization, 5-100 PSI setting range,
 - 125 PSI maximum system pressure. Check valve – Protects the user from back-flow
 - during pump maintenance.
 - Gauge Guard Protects pressure gauge from chemical attack.
- Flow indicator Provides a visual indication of chemical movement through the system.
- Vented ball valves Protects the system from chemicals that off gas, such as bleach.
- Calibration cylinder Self filling cylinder, does not require chemical level in supply tank be above calibration cylinder for filling.

TECHNICAL INFORMATION – CONSTRUCTION

- Skid: Chemical resistant polyester powder coated 6061 T6 aluminum. Welded joint construction.
- Piping: PVC Schedule 80 (optional CPVC). Tubing: Reinforced braided PVC, 200 PSI max, NSF
- standard 61 Tubing Clamps: 300 series SS band, 400 series SS screw. Unions: PVC Schedule 80 (optional CPVC), FKM
- elastomers (optional EPDM).
- Ball Valves: Vented type ball. True unions. PVC body. PTFE shaft bearings and seats, FKM elastomers (optional EPDM), Manufacturer: Plast-O-Matic®
- Pressure Relief Valve: (PRV) PVC body (optional CPVC), PTFE primary diaphragm seal, Manufacturer: Plast-O-Matic[®].
- Calibration Cylinder: PVC clear body, PVC end caps, 1/4" ID tubing outlet vent.
- Pulsation Dampener: CPVC body, 10 cubic inch volume, FKM bladder (optional EPDM bladder) .
- Gauge with Guard Gauge: liquid filled stainless steel with blowout plug, bottom mount, 1/4" NPT. Gauge Guard: PVC body (CPVC optional), FKM diaphragm seal, temperature compensated oil filled, Manufacturer: Plast-O-Matic®
- Check Valve: PVC body (optional CPVC), FKM diaphragm (optional EPDM), Manufacturer: Plast-O-Matic®
 - Flow Indicator: Machined cast acrylic, PVC connections, ceramic ball, polypropylene ball stop, PVC half unions, FKM seals (optional EPDM), Manufacturer: Blue-White Ind.®



Y Strainer: PVC body (optional CPVC), FKM elastomers (optional EPDM). Flow Verification Sensor: PVDF body, PVC socket weld fittings, FKM elastomers (optional EPDM), Manufacturer: Blue-White Ind.

Universal Mounting Blocks: PVC (non-wetted part). Skid Mounting Foot / Wall Pads: 316 Stainless Steel (non-wetted part).

Drip Tray: Polypropylene, 4 gallon containment each tray.

SHIPPING INFORMATION:

Single Pump Skid Units Approximate Shipping Weight 60 lb. (27.2 Kg) without pump

Dual Pump Skid Units Approximate Shipping Weight 70 lb. (31.8 Kg) without pump

INSTALLATION EXAMPLES *ProSeries-M' SONIC-PRO*



Raleigh NC, D.E. Benton WTP: Caustic Application. M-3 on Dual Skid.



Detroit Southwest WTP: Blue-White Peristaltic pumps excel in polymer injection applications, as shown here installed in Polymark blending systems at the Detroit Southwest WTP.



Mammoth Lakes, CA, Mammoth Community Water District: Sodium Hypochlorite (NaClO) and Ferric Chloride (FeCL₃) for Arsenic Removal. M-3.



Anchorage Water & Waste Water: Dual MC-3 pumps used for a PAC application, utilizing Blue-White's Microflo meters.



Valencia Heights WTP, CA: Sodium Hypochlorite (NaClO) Application. M-2 utilizing Advanced communication protocol.



West Valley Water District in Rialto, CA: ProSeries-M® M-3 and M-4 Pumps installed at their Water Filtration Facility.



Keene Waste Water Treatment Plant: Sonic-Pro® S3 Flowmeter Helps Maintain 'Food to Microorganism' Balance in Return Activated Sludge Line.

SONIC-PRO **HYBRID ULTRASONIC FLOWMETERS**

ProSeries

SONIC-PRO® HYBRID ULTRASONIC FLOWMETERS

can be used in Doppler or Transit Time operation modes. Sonic-Pro® will measure the flow of virtually any fluid in which sound waves can travel.

Because the ultrasonic sound transducers are clamped to the outside of the pipe wall, the Sonic-Pro® can measure flow in both clean and dirty fluids. In addition, because the meter does not come in contact with the fluid being measured, Sonic-Pro® is well suited for use in applications where harsh chemicals and other abrasive fluids are being used.

The meter can be equipped with a communications package for PC remote access allowing for program editing and downloading of data logs. Additionally, a relay package is available for process control and alarm functions.

S1

52



. . . .

AVAILABLE DISPLAY OPTIONS

- No local display. Factory configured for one application. Communication package required to access configuration menu and data log.
- High quality 320 x 240 pixel QVGA backlit LCD display. Two button interface, allows user access to clear accumulated total and swap rate and total display fonts. Communication package required to access configuration menu.
- **53** High quality 320 x 240 pixel QVGA backlit LCD display Five button, fully configurable, tactile switch keypad interface. Security: master and configuration passwords.

DI water

- Wastewater Discharge water Pulp and Paper
 - Caustics
 - Chemical Slurries
 - Petrochemical Any sound

Ground water

conducting liquid

Food and Beverage

TECHNICAL SPECIFICATIONS

CE ID.

PIPF

T-TRAC

T-Track fitting allows for small and large pipe diameter capabilities (.5"–48"). Pipe size range .5"-100".

FLUID

Doppler Mode: Requires particles to be present in the flow stream to "reflect" the sound waves. (ie. Air bubbles, sand, etc.) **Operational Environment:** fluid contains .02%–15% (200–150,000 ppm) of particles. Transit Time Mode: Requires relatively "clean" fluid to enable the sound waves to complete a circuit.

Operational Environment: 0%–10% (0-100,000 ppm) of particles.

ACCURACY

than 1 ft/sec fluid velocity.

- +/- 2% of rate in Doppler mode greater

+/- 0.10 ft/sec in Doppler mode less than 5 ft/sec velocity.

INTERFACE AND DATA

3

0

96.08 4590

IP66

NEMA 49X

Data logging: to standard SD Card supplied with unit. User configurable to time interval, flow rate and total set-point triggers. 2,000,000 events with included 128MB SD Card.

50NI

96.08 4590.50

٢

3

Optional Computer Connection: Ethernet, USB, RS-232, RS-485. Permits remote access and control of all functions including real-time display, system configuration, data logging, remote data capture as well as process control functions. Software permits remote internet access through local network setup.

Optional Process Control: Three independently configurable 10 amp, form C relays. May be configured to flow rate or high/low rate alarm.

• 4-20mA output: Fully configurable

• 0-1000Hz Puis	e Output . Fully	configurable
		Shinning

DIMENSI	Dimensions		
Height	11" (27.9 cm)	21"	
Width	8.5" (21.8 cm)	17"	
Depth	5" (12.7 cm)	9.5"	
Weight	24 lbs. (10.9 Kg)		
Includes	carry case Excludes T-	Track fixture	

ENVIRONMENT

clamps and hardware.

MEND T-TRACK MOUNTING SYSTEM FOR FAST AND EFFECTIVE INSTALLATION

- The patented (U.S. 9,374,024) T-Track Mounting System is designed to quickly and accurately mount transducers utilizing a built-in ruler and mounting base, to ensure transducers are perfectly aligned and spaced.
- Heavy gauge Stainless Steel cover, anodized aluminum end blocks, and polymeric tensioning clamps provide transducer protection for years of service in tough environments.

.

SINGLE T-TRACK

For V-Mount method. Available for two pipe ranges: .5" to 4" and 2" to 14".

DUAL T-TRACK

- For V or Z-Mount method. Available for 2" to 48" pipe.

FLUIDS

Sewage

Slurries



+/- 1% of rate in Transit-Time mode greater +/- 0.01 ft/sec in Transit-Time mode less than 1ft/sec fluid velocity.

than 5 ft/sec fluid velocity.





5300 Business Drive, Huntington Beach, CA 92649 (714) 893-8529 | *Fax* (714) 894-9492 | techsupport@blue-white.com sales@blue-white.com

www.blue-white.com www.proseries-m.com

80000-534 Rev.3 © B/W - 04/17

