

CHEM-FEED®

Multi-Diaphragm Metering Pump



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Series MD1



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READ THE INSTRUCTION MANUAL PRIOR TO INSTALLATION AND USE.

1.0 INTRODUCTION

Congratulations on purchasing the MD1 variable speed Multi-Diaphragm Metering Pump.

Please Note: Your new pump has been pressure tested at the factory with clean water before shipping. This is part of our stringent quality assurance program at Blue-White Industries.

1.1 Available Models

Chem-Feed® MD1 Multi Diaphragm Metering Pump

Feed Rate ²		Maximum Pressure PSI (bar) ³	Maximum Temperature °F (°C) ³	Model Numbers
GPH	LPH			
0.0007 - 7.70	0.0029 - 29.2	150 (10.3)	185 (85)	All MD1 Models

2.0 ENGINEERING SPECIFICATIONS

Maximum Working Pressure (Excluding pump tubes) ¹	150 PSI (10.3 bar)
Maximum Fluid Temperature	185°F (85°C)
Maximum Viscosity	1000 centipoise
Maximum Suction Lift	20 ft. at 0 PSI
Ambient Operating Temperature	14°F to 115°F (-10°C to 42°C)
Ambient Storage Temperature	-40°F to 158°F (-40°C to 70°C)
Operating Voltage	115V60Hz 1 PH (0.6A max.) 220V50Hz 1 PH (0.3A max.) 230V60Hz 1 PH (0.3A max.) 230V50Hz 1 PH (0.3A max.) 240V50Hz 1 PH (0.3A max.)
Power Cord Options	115V50/60Hz = NEMA 5/15 (USA) 230V50/60Hz = NEMA 6/15 (USA) 220V50/60Hz = CEE 7/VII (EU) 240V50/60Hz = AS 3112 (Australia/New Zealand) 230V50/60Hz = BS 1363/A (UK)
Motor	Brushless DC, 50W
Duty Cycle	Continuous
Motor Speed Adjustment Range	10,000:1 (0.01% - 100%)
Enclosure	NEMA 4X (IP66), Valox® (PBT) & PA12
Maximum Overall Dimensions	7.25" W x 9" H x 10" D (18.5 W x 22.9 H x 25.2 D cm)
Product Weight	8.5 lb. (3.8 Kg)
Approximate Shipping Weight	15.5 lb. (5.9 Kg)
Approximate Shipping Dimensions	10.5" W x 13.75" H x 11" D (26.7 W x 35 H x 28 D cm)

3.0 CONSTRUCTION MATERIALS

3.1 Wetted Components

Pump Head Assembly

Pump Head	PVDF
Adapter Connections	PVDF
Valve Cartridge	PVDF
Valve Balls	Ceramic
O-Ring Seals	TFE/P (optional EP)
Diaphragm	DiaFlex® (optional Flex-A-Prene®)

Injection / Back-Flow Check Valve

Body & Insert	PVDF
Check Ball	Ceramic
Spring	Hastelloy C-276
Ball Seat & Static Seal O-Ring	TFE/P (optional EP)

Foot Valve / Strainer

Body & Adapter	PVDF
Check Ball	Ceramic
Spring	Hastelloy C-276
O-Ring Seal	TFE/P (optional EP)
Filter Screen	PVDF

3.2 Non-wetted Components

Enclosure	Valox® (PBT) & PA12
Drive Enclosure	PA12
Pump Head Cover	Polycarbonate
Cover Screws	Stainless steel, polypropylene cap
DFD System Sensor Pins	Hastelloy C-276
Power Cord	3 conductor, SJTW-A water-resistant
Mounting Brackets and Hardware	3/16" stainless steel screws GF nylon bracket

4.0 Features

- ▶ Smooth chemical dosing, no pulsation dampener needed
- ▶ Diaphragm Failure Detection (DFD) system which senses diaphragm failure
- ▶ Rated for continuous duty
- ▶ Compatible with Blue-White Industries Flow Verification Sensor (FVS) system
- ▶ Remote Start/Stop
- ▶ Relay outputs include a single 250V/3A and a single solid state
- ▶ Multi diaphragm metering with a turndown ratio of 10,000:1
- ▶ Built for long life at high pressures up to 150 PSI (10.3 bar)
- ▶ Output rates up to 7.70 GPH (29.2 LPH)

4.1 Agency Listings



This pump is ETL listed to conform to the following: UL Standard 778 as a motor operated water pump. CSA Standard C22.2 as process control equipment



This pump complies to the Machinery Directive 98/37/EC, BS, EN 60204-1, Low Voltage Directive 73/23/EC BS EN 61010-1, EMC Directive 89/336/EC, BS EN 50081-1/BS EN 50082-1.



This pump is certified to NSF/ANSI Standard 61- Drinking Water System Components - Health Effects

Symbol	Description
	Warning (Risk of electric shock)
	Caution (Refer to the user's guide)
	Ground, Protective Conductor Terminal

ENCLOSURE RATING

NEMA 4X Constructed for either indoor or outdoor use to provide a degree of protection to personnel against incidental contact with enclosed equipment; to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water; and that will be undamaged by external formation of ice on enclosure.

IP66 No ingress of dust; complete protection against contact. Water projected in powerful jets against enclosure from any direction shall have no harmful effects.

5.0 INSTALLATION

CAUTION

The pump should be serviced by qualified persons only. If equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

CAUTION

Risk of chemical overdose. Be certain pump does not overdose chemical during backwash and periods of no flow in circulation system.

CAUTION

Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.

CAUTION

All diagrams are strictly for guideline purposes only. Always consult an expert before installing metering pump on specialized systems. Metering pump should be serviced by qualified persons only.

CAUTION

Be sure that installation does not constitute a cross connection with drinking water supply. Check your local plumbing codes.

CAUTION

The pump should be supplied by an isolating transformer or RCD (operating current less or equal 30 mA).

5.1 Mounting Location

1. Choose an area located near the chemical supply tank, chemical injection point, and electrical supply. Also, choose an area where the pump can be easily serviced.
2. Finding a secure surface and using the provided mounting hardware, mount the pump close to the injection point. Keep the inlet (suction) and outlet (discharge) tubing as short as possible. Longer discharge tubing increases back pressure at pump head.

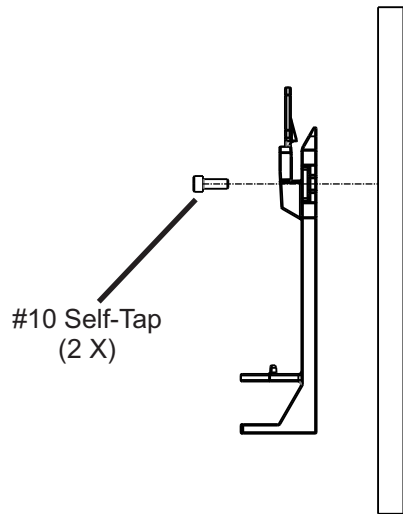
NOTE: Mounting the pump lower than the chemical container will gravity-feed chemical into it. This “flooded suction” installation will reduce output error due to increased suction lift. A shut-off valve, pinch-clamp, or other means to halt gravity-feed to the pump must be installed during servicing.

NOTE: Install a back flow prevention check valve at the discharge side of the pump to prevent the system fluid from flowing back through pump during pump maintenance.

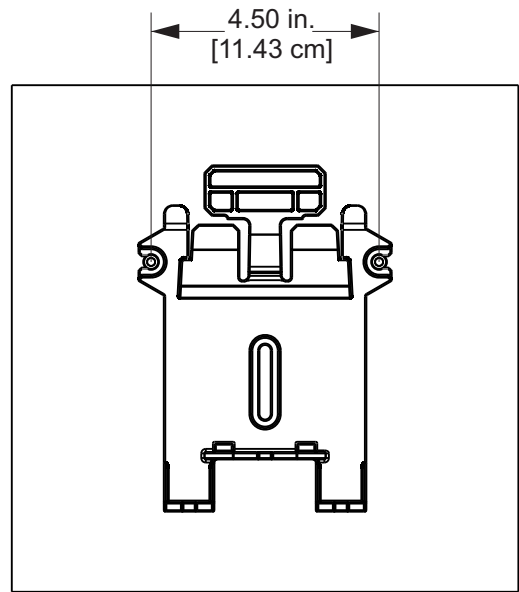
NOTE: It is recommended to have a pressure relief valve at the discharge side of the of pump.

5.2 Wall Mounting

1. Using the provided #10 self-tapping screws, mount the bracket to a secure wall that is located where it can be easily serviced.

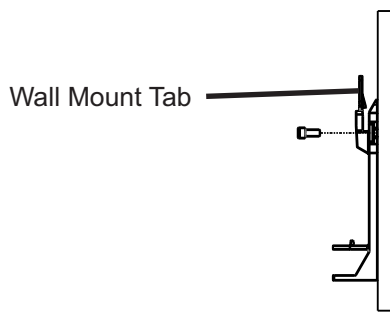
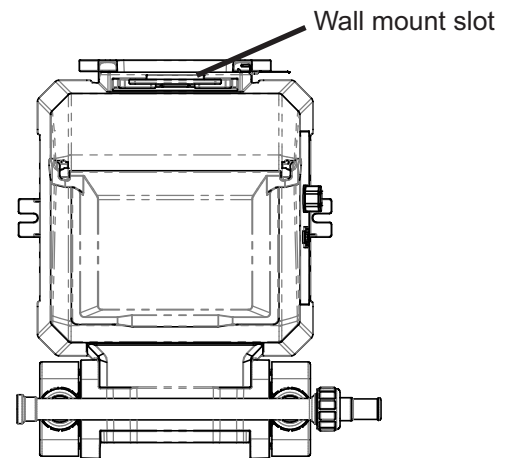
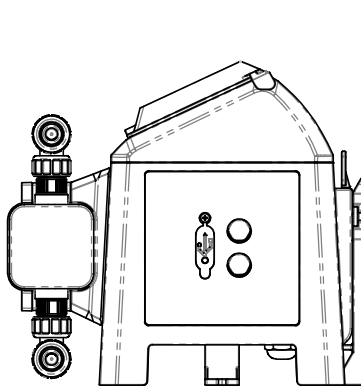


Wall Mount Bracket (Side View)

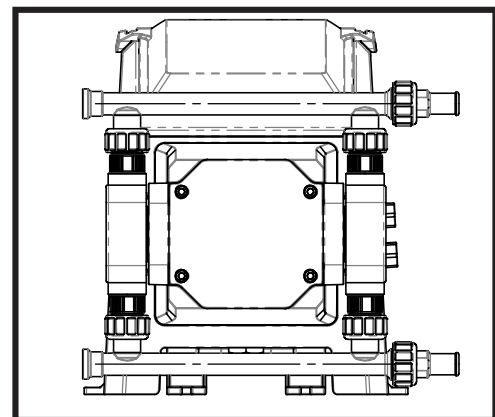


Mounted Pump (Front View)

2. Lower the pump so that the tab on the wall mount is inserted into the slot located on the back of the pump. The pump will now be secured to the wall mount bracket.

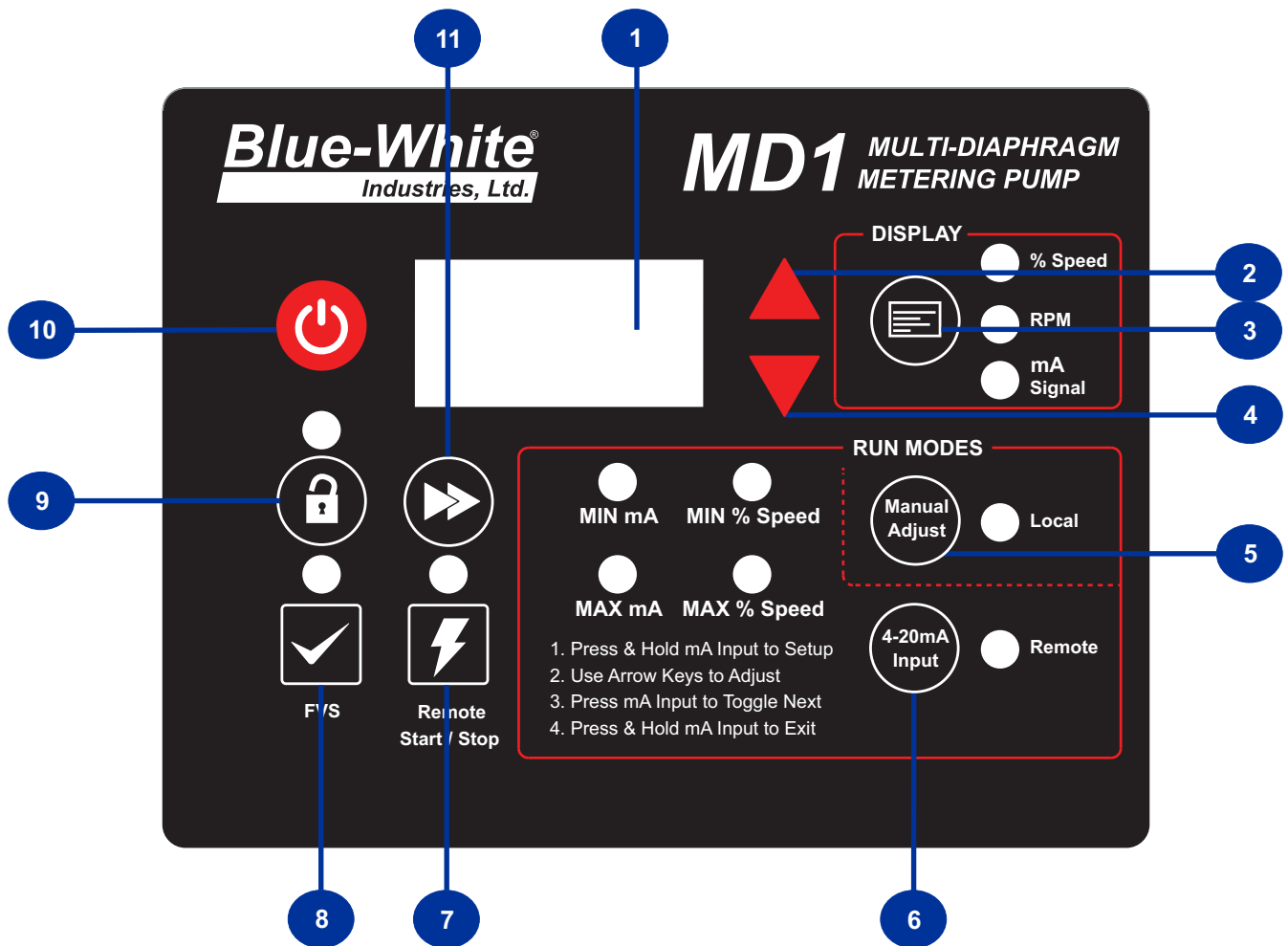


Wall Mount (Side View)



Mounted Pump

6.0 TOUCHPAD LAYOUT

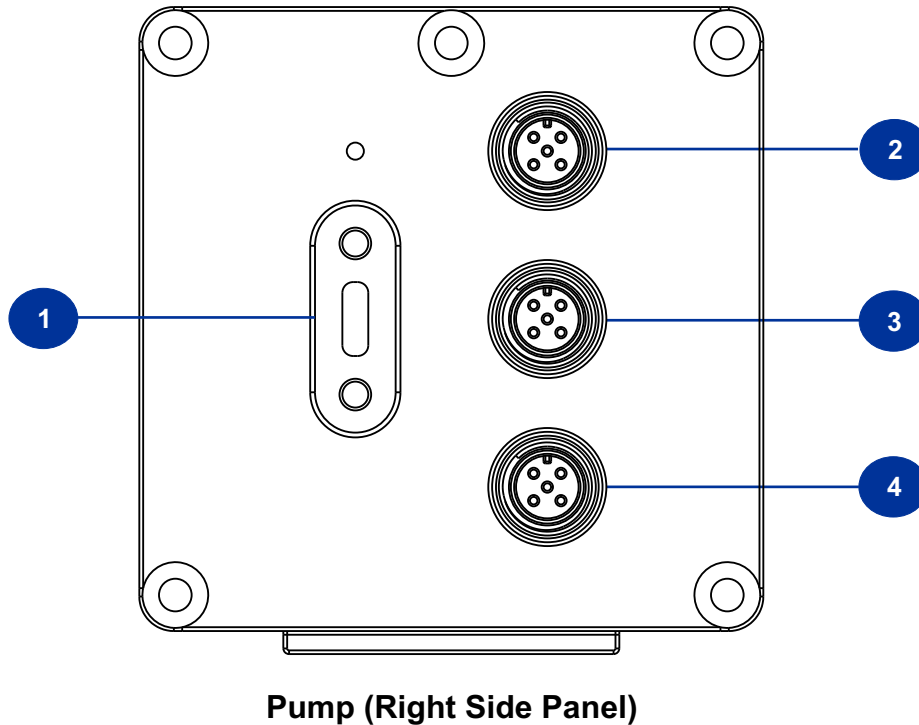


Item Number	Item
1	LED/LCD Readout
2	Up Key
3	Rate Display Key
4	Down Key
5	Manual Adjust Control
6	4-20mA Input Control
7	Remote Start/Stop Key
8	Flow Verification Sensor (FVS) Key
9	Lock-Out Key
10	Start & Stop Key
11	Prime Key

6.1 IO Connection



Risk of electric shock - All wiring must be insulated and rated 60V minimum.

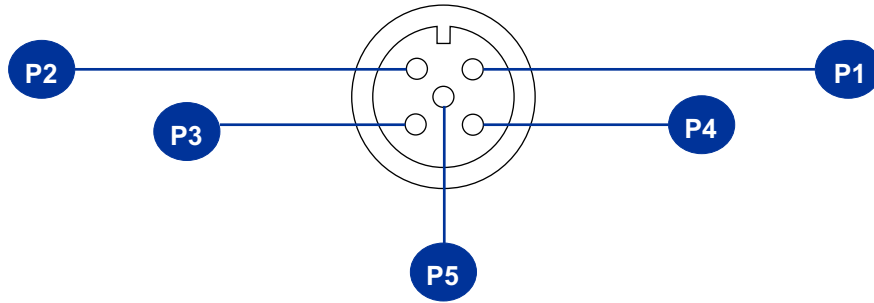


Item Number	Item
1	USB-C Connector
2	M12 Input Connector 1
3	M12 Input Connector 2
4	M12 Output Connector

M12 connectors not included with product.

Blue-White Industries requires any A-Type M12 connector with 5 position female sockets

M12 Connector



M12 Input Connector 1

PIN	Function	Specifications	Reference
P1	4-20mA Input (+)	120 Ohm Impedance, Non powered loop	(+) Positive
P2	4-20mA Input (-)	120 Ohm Impedance, Non powered loop	(-) Negative
P3		Not Used	
P4		Not Used	
P5		Not Used	

M12 Input Connector 2

PIN	Function	Specifications	Reference
P1	Remote Start / Stop	N.O. Dry Contact Closure	Open = Stop Gnd = Run
P2	Ground	DC Ground	0 VDC
P3	FVS (+)	15 VDC @ 60 mA	To power FVS sensor
P4	FVS (-)	DC Ground (0 VDC)	FVS Ground Input
P5	FVS (Signal)	Input Signal	Input for FVS Signal

M12 Output Connector

PIN	Function	Specifications
P1	Remote Start / Stop	N.O. Dry Contact Closure
P2	Ground	DC Ground
P3	FVS (+)	15 VDC @ 60 mA
P4	FVS (-)	DC Ground (0 VDC)
P5	FVS (Signal)	Input Signal

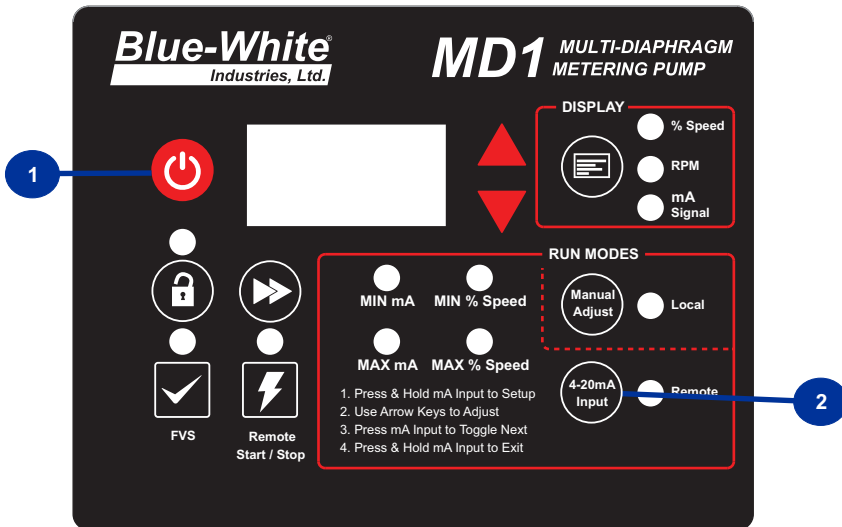
7.0 4-20mA Input

CAUTION



Proper eye and skin protection must be worn when installing and servicing the pump.

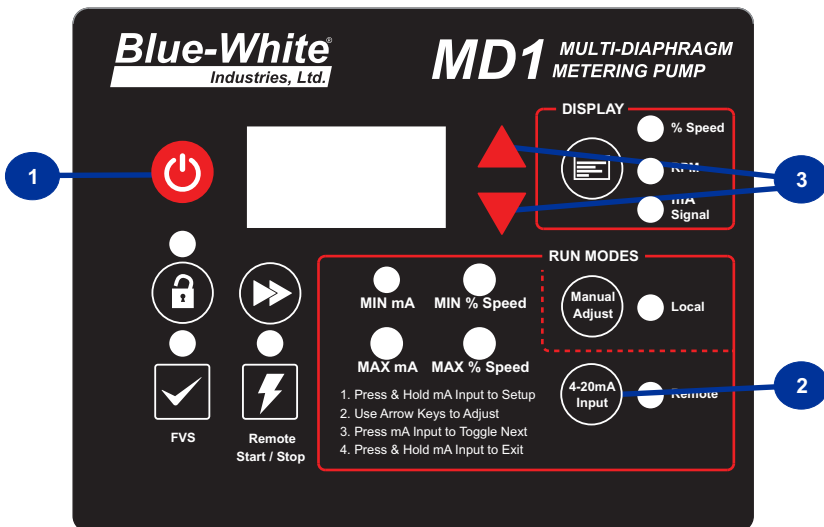
7.1 Selecting 4-20mA input mode



Directions

- 1 Confirm that pump is in the OFF position
- 2 Press 4-20mA Input button

7.2 Programming 4-20mA input mode



Directions

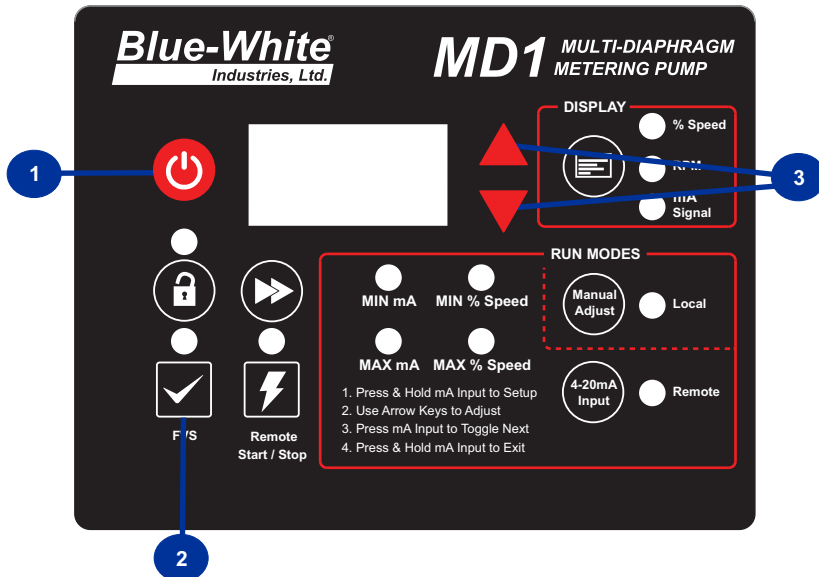
- 1 Confirm that pump is in the OFF position.
- 2 Press and hold 4-20mA Input button.
- 3 MIN mA light will illuminate. Use arrow keys to toggle min mA value for the pump to operate at
- 4 Press 4-20mA Input button for MIN % Speed light to illuminate
- 5 Use arrow keys to toggle MIN % Speed value for the pump to operate.
- 6 Press 4-20mA Input button for MAX mA light to illuminate.
- 7 Use arrow keys to toggle MAX mA value for the pump to operate.
- 8 Press 4-20mA Input button for MAX % Speed light to illuminate.
- 9 Use arrow keys to toggle MAX % Speed value for the pump to operate.
- 10 Press and hold 4-20mA Input button to exit programming mode.

8.0 Programming FVS (Flow Verification Sensor)

CAUTION



Proper eye and skin protection must be worn when installing and servicing the pump.



Directions

- 1 Confirm that pump is in the OFF position
- 2 Press and hold FVS button
- 3 Toggle up/down arrow until desired trigger time is shown (seconds)
- 4 Press and hold FVS button to set

NOTE: Alarm Delay Time range is 1-20 seconds

9.0 POWER CONNECTIONS

WARNING



Risk of electric shock – cord connected models are supplied with a grounding conductor and grounding-type attachment plug. To reduce risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

WARNING



Electrical connections and grounding (earthing) must conform to local wiring codes.

WARNING



Ensure to connect the pump to the proper supply voltage. Using the incorrect voltage will damage the pump and may result in injury. The voltage requirements is printed on the pump serial label.

- ▶ Use the voltage for which the power cord is rated.
- ▶ Do not strap together control (input/output) cables and power cables.
- ▶ When there is a power interruption, the pump, which has an auto-restart feature, will restore the pump to the operating state it was in when the power was lost.
- ▶ POWER: 115V60Hz (0.6A max.), 220V50Hz (0.3A max.), 230V60Hz (0.3A max.), 230V50Hz (0.3A max.), 240V50Hz (0.3A max.)

NOTE: Contact a licensed electrician when there is doubt regarding the electrical installation.

10.0 OUTPUT ADJUSTMENT

The speed of the pumping mechanism is adjustable from 0.01 to 100 % motor speed (0.01 RPM to 100 RPM).

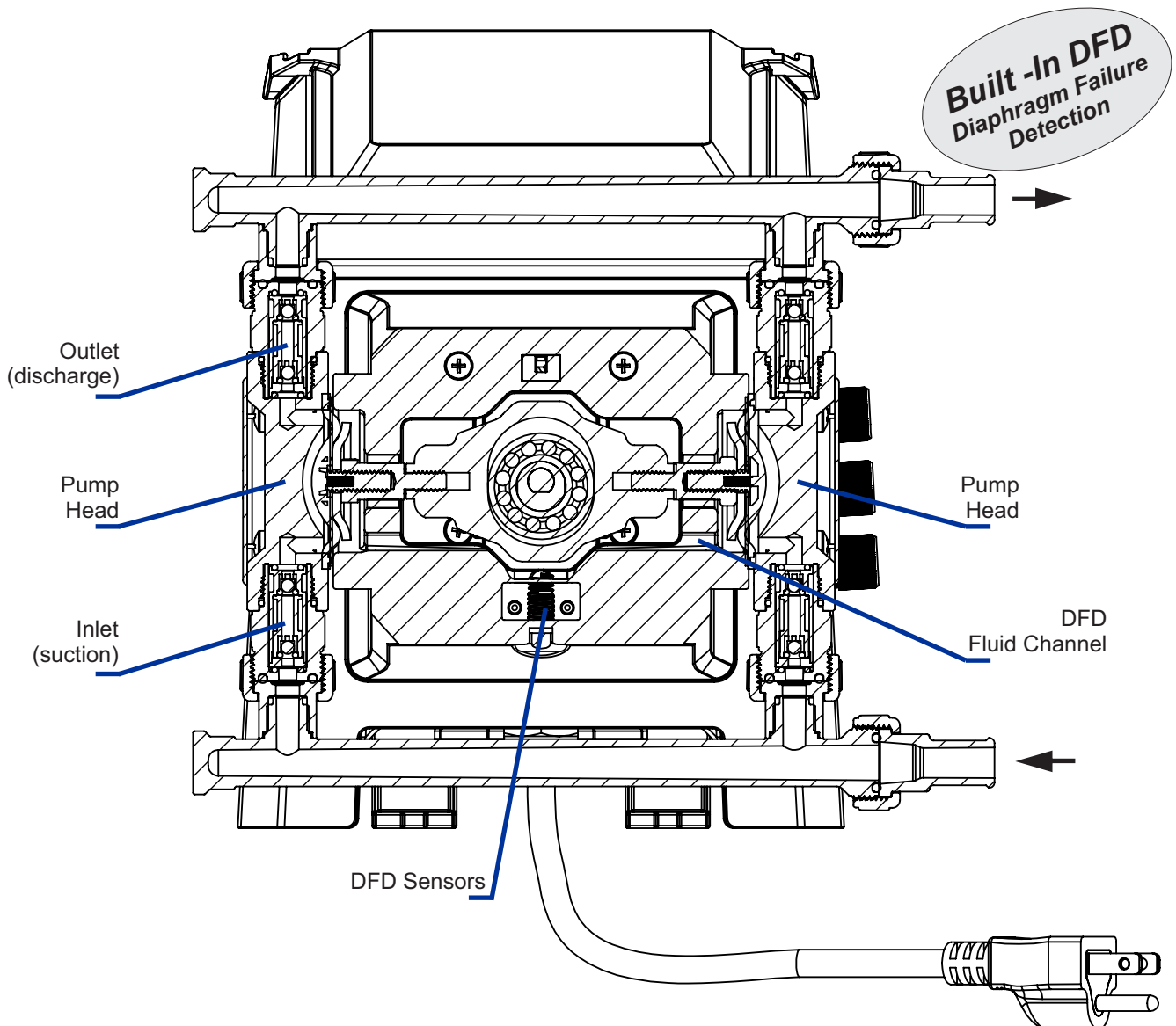
11.0 DFD (Diaphragm Failure Detection)

The MD1 is equipped with a Diaphragm Failure Detection System which is designed to stop pump and provide an output alarm in event diaphragm should rupture and chemical enters pump head.

This system is capable of detecting presence of a large number of chemicals including Sodium Hypochlorite (Chlorine), Hydrochloric (muriatic) Acid, Sodium Hydroxide, and many others. System will not be triggered by water (rain, condensation, etc.) or lubricants.

If system has detected chemical, pump diaphragm must be replaced and pump head must be thoroughly cleaned. Failure to clean pump head will void warranty.

If DFD alarm occurs, pump will stop, close an alarm output, and screen will flash DFD with an alarm icon.



12.0 Pump Maintenance

CAUTION



Prior to service, pump clean water through pump and suction / discharge line to remove chemical.

CAUTION



Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.

12.1 Routine Inspection and Maintenance

Pump requires very little maintenance. However, pump and all accessories should be checked weekly. This is especially important when pumping chemicals. Inspect all components for signs of leaking, swelling, cracking, discoloration or corrosion. Replace worn or damaged components immediately.

Cracking, crazing, discoloration during first week of operation are signs of severe chemical attack. If this occurs, immediately remove chemical from pump. Determine which parts are being attacked and replace them with parts that have been manufactured using more suitable materials. Manufacturer does not assume responsibility for damage to pump that has been caused by chemical attack.

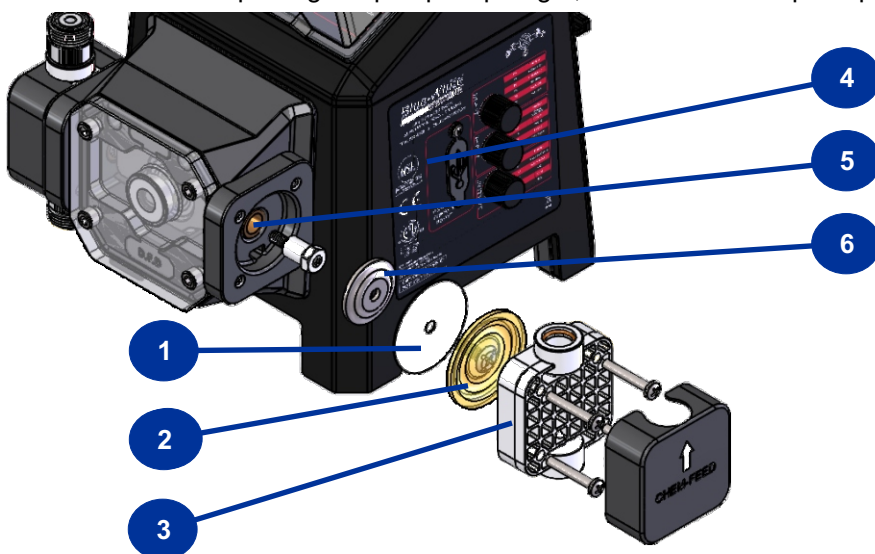
12.2 Cleaning Pump

Pump will require occasional cleaning, especially Injection fitting, Foot Valve / Strainer, and pump head valves. Frequency will depend on type and severity of service.

- ☑ Inspect and replace pump head valves as required.
- ☑ Periodically clean injection / check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog fitting, increase back pressure and interfere with check valve operation.
- ☑ Periodically clean suction strainer.
- ☑ Periodically inspect pump housing (enclosure) for chemical attack. Protect pump housing from continuous exposure to chemicals, such as drips or fumes from surrounding equipment and plumbing.

12.3 Replacing the Pump Diaphragm

- ☑ When changing the diaphragm, the pump head chamber and pump head cover should be wiped free of any dirt and debris. The pump stroke must be FORWARD when installing the diaphragm, and BACK when installing and tightening the pump head.
- ☑ When replacing the pump diaphragm, note the order of parts per the illustration below:



Item	Item
1	PTFE Ring
2	Diaphragm
3	Pump Head
4	Pump
5	Piston
6	Backup Washer

13.0 ACCESSORIES

The following accessories are available for the MD1 Multi-Diaphragm Metering Pump. Please visit Blue-white.com for more information. All accessories are sold separately.



KIT-M12

Kit contains: Two M12 cables.

KIT-M12 WIRING INSTRUCTIONS		
DIAGRAM	PIN #	WIRE COLOR
	PIN 1	WHITE
	PIN 2	BROWN
	PIN 3	BLACK
	PIN 4	BLUE
	PIN 5	GRAY



KIT-M12-3

Kit contains: Three M12 cables.



CABLE-UAC

Kit contains: One 3' USB-A to USB-C cable.



KIT-CQE

Kit contains: One discharge fitting with EP o-rings installed (red), One suction fitting with EP o-rings installed (white), Two tube nuts, Two 1/2" hose barb quick connect adapters, Two 1/2" M/NPT quick connect adapters, Two quick disconnect adapters and Two #5 hose clamps.



KIT-CQA

Kit contains: One discharge fitting with Aflas o-rings installed (red), One suction fitting with Aflas o-rings installed (white), Two tube nuts, Two 1/2" hose barb quick connect adapters, Two 1/2" M/NPT quick connect adapters, Two quick disconnect adapters and Two #5 hose clamps.

NOTE: All Accessories are sold separately

**KIT-C5B**

Kit contains: Two union nuts, Two 1/2" hose barb adapters, Two #5 hose clamps, One 2 1/2' clear reinforced PVC tube and One 5' 5/8" suction tube

**KIT-S7**

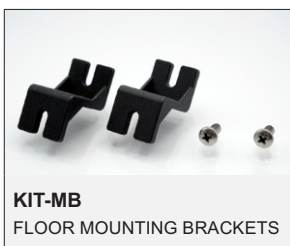
Kit contains: One 7 gallon tank, One 3/8" suction tube, One 3/8" discharge tube, One foot valve and strainer and One mounting bracket with screws

**KIT-S15**

Kit contains: One 15 gallon tank, One 3/8" suction tube, One 3/8" discharge tube, One foot valve and strainer and One mounting bracket with screws

**KIT-S30**

Kit contains: One 30 gallon tank, One 3/8" suction tube, One 3/8" discharge tube, One foot valve and strainer and One mounting bracket with screws

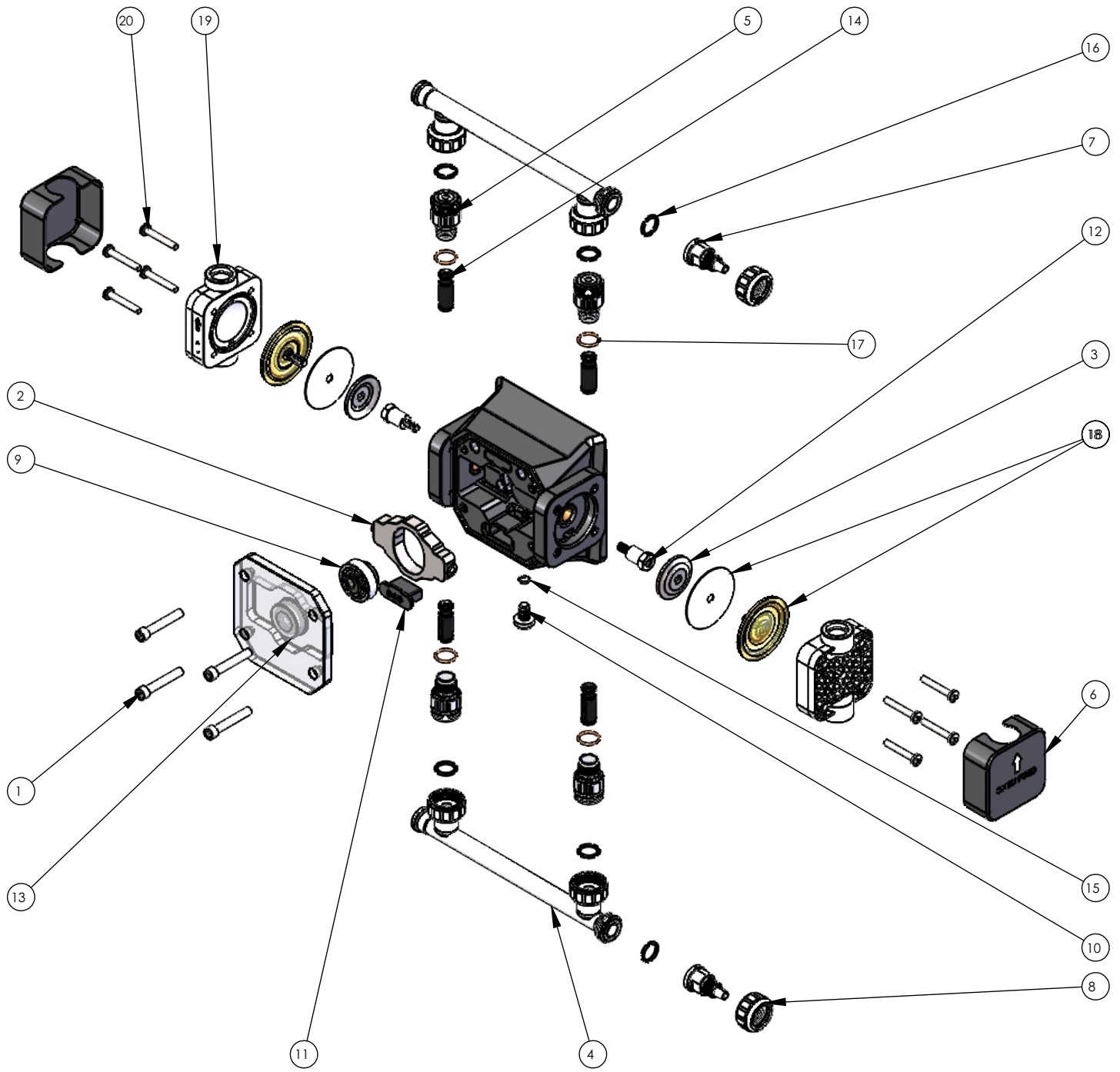
**KIT-MB**

Kit contains: Two floor mounting brackets and Two screws

14.0 REPLACEMENT PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	90011-264	SCREW 10-32 X .375 SOC CAP SS	4
2	76001-945	HYPER-DRIVE MD1 MACHINED	1
3	90006-600	BACK-UP WASHER HD .100" THICK	2
4	71010-730	MANIFOLD NUT UNION AND FLANGE SPIN WELD MD1	2
5	90002-707	ADAPTER CART MD1	4
6	70004-539	P/HEAD COVER CHEM-FEED MD1	2
7	90002-708	.37T ADAPTER	2
8	90002-712	NUT UNION MD-1 MOLDED PVDF	2
9	70000-131	CAM C-1500 S/A .125" COMPLETE	1
10	90011-261	SCREW 5/16-18 X .50"L PHIL NYLON BLK MD1	1
11	76002-034	CAP DFD MD1	1
12	76001-966	STANDOFF HEX MALE-FEMALE THREADED MD1 MACH.	2
13	71010-745	COVER PUMPHEAD MOUNT ASSY MD1	1
14	71000-392	CART BULLET DOUBLE AFLAS PVDF	4
15	90003-003	O-RING 010 EP	1
	90003-004	O-RING 010 VITON	
16	90003-581	O-RING 2-112 AFLAS	6
	90003-208	O-RING 2-112 EP	
17	90003-125	O-RING 015 AFLAS	4
	90003-015	O-RING 015 EP	
18	KIT-CDV	DIAPHRAGM MD1 PVDF	2
	KIT-CDE	DIAPHRAGM MD1 FLEX-A-PRENE	
19	70004-096	PUMP/HD HDN LG PVDF V STAMP	2
	70004-097	PUMP/HD HDN LG PVDF E STAMP	
20	90011-141	SCREW 10-32 X1.25 PAN PHIL SS	8

14.1 EXPLODED VIEW



15.0 TROUBLESHOOTING

Error Code	Explanation	Troubleshooting
E01	Motor Over Current	Ensure that diaphragm is installed properly
E02	Over Voltage	Check power supply output voltage
E03	Under Voltage	Check power supply output voltage
E04	Temperature exceeds 75°C at control	Check ambient conditions, restart pump once cooled to ambient temperature
E05	Inverter Error	Contact Blue-White Industries (714) 893-8529 techsupport@blue-white.com
E06	No Motor Connection	Contact Blue-White Industries (714) 893-8529 techsupport@blue-white.com
E08	Motor Stall	Ensure that diaphragm is installed properly
E10	Capacitor bank charging error	Contact Blue-White Industries (714) 893-8529 techsupport@blue-white.com
E17	Communication error at display	Contact Blue-White Industries (714) 893-8529 techsupport@blue-white.com

16.0 WARRANTY

16.1 Limited Warranty

The pump is a quality product and is warranted for 36 months from date of purchase (proof of purchase is required). The pump will be repaired or replaced at our discretion. The pump head and roller assembly are warranted against damage from a chemical attack when the proper Diaphragm Failure Detection(DFD) system instructions and maintenance procedures are followed.

16.2 What is not Covered

- ▶ **Pump diaphragm and rubber components - They are perishable and require periodic replacement**
- ▶ **Pump removal, or re-installation, and any related labor charge.**
- ▶ **Freight to the factory.**
- ▶ **Pumps that have been tampered with, or in pieces.**
- ▶ **Damage to the pump that results from misuse, carelessness (such as chemical spills) on the enclosure, abuse, lack of maintenance, or alteration that is out of Blue-White Industries, Ltd.'s control.**
- ▶ **Pumps damaged by faulty wiring, power surges, or acts of nature.**

Blue-White Industries, Ltd. does not assume responsibility for any loss, damage, or expense directly or indirectly related to or arising out of the use of its products. Failure must have occurred due to defect in material or workmanship and not as a result of operation of the product other than in normal operation as defined in the pump operation manual.

The warranty status is determined by the pump's serial label and the sales invoice or receipt. The serial label must be on the pump and be legible. The warranty status of the pump will be verified by Blue-White Industries, Ltd. or a factory authorized service center.

16.3 Obtaining In-Warranty Repair

Contact the factory to obtain a RMA (Return Material Authorization) number. Carefully pack the pump to be repaired. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Please enclose a brief description of the problem as well as the original invoice or sales receipt, or copy showing the date of purchase. Prepay all shipping costs. COD shipments will not be accepted. Warranty service must be performed by the factory or an authorized ProSeries service center. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair or replacement is completed, the factory pays for return shipping to the dealer or customer.

16.4 Product Use Warning

Blue-White products are manufactured to meet the highest quality standards in the industry. Each product instruction manual includes a description of the associated product warranty and provides the user with important safety information. Purchasers, installers, and operators of Blue-White products should take the time to inform themselves about the safe operation of these products. In addition, Customers are expected to do their own due diligence regarding which products and materials are best suited for their intended applications. Blue-White is pleased to assist in this effort but does not guarantee the suitability of any particular product for any specific application as Blue-White does not have the same degree of familiarity with the application that the customer/end user has. While Blue-White will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties. **BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE FAILURE OF ANY OF ITS PARTS OR PRODUCTS OR OF THEIR NONSUITABILITY FOR A GIVEN PURPOSE OR APPLICATION.**

16.5 Chemical Resistance Warning

Blue-White offers a wide variety of wetted parts. Purchasers, installers, and operators of Blue-White products must be well informed and aware of the precautions to be taken when injecting or measuring various chemicals, especially those considered to be irritants, contaminants or hazardous. Customers are expected to do their own due diligence regarding which products and materials are best suited for their applications, particularly as it may relate to the potential effects of certain chemicals on Blue-White products and the potential for adverse chemical interactions.

Blue-White tests its products with water only. The chemical resistance information included in this instruction manual was supplied to Blue-White by reputable sources, but Blue-White is not able to vouch for the accuracy or completeness thereof. While Blue-White will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE, WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE USE OF CHEMICALS IN CONNECTION WITH ANY BLUE-WHITE PRODUCTS.

ACRONYMS

°C	Celsius	min	Minute
°F	Fahrenheit	mL	Milliliters
AC	Alternating current	MSDS	Material Safety Data Sheet
bar	Unit of pressure	N.C.	Normally Close
CIP	Clean-in-place	N.O.	Normally Open
cm	Centimeters	NPT	National Pipe Thread
COD	Cash on Delivery	NSF	National Sanitation Foundation
D	Depth	OD	Outside diameter
DC	Direct current	P.N.	Part Number
DFD	Diaphragm Failure Detection	PBT	Polybutylene Terephthalate
EEE	Electrical and electronic equipment	PE	Polyethylene
EP	Ethylene propylene	PSI	Pounds per Square Inch
ETL	Electrical Testing Labs/Intertek	PVC	Polyvinyl chloride
EU	European Union	PVDF	Polyvinylidene fluoride
FDA	Food and Drug Administration	RCD	Residual-current device
FKM	Fluoroelastomer	Rev.	Revision
FVS	Flow Verification Sensor	RMA	Return Material Authorization
GF	Glass fiber	RPM	Revolutions per minute
GPD	Gallons per day	SIP	Steam-in-place
GPH	Gallons per hour	SS	Solid state
H	Height	TFD	Tube Failure Detection
Hz	Inside diameter	TFE/P	Tetrafluoroethylene propylene
IO	Input/Output	UL	Underwriters Laboratories
Kg	Kilogram	US	United States
lb.	Pound	V	Volt
LLDPE	Linear low-density polyethylene	W	Watt
LPH	Liters per hour	W	Width
mA	Milliampere	WEEE	Waste Electrical and Electronic Equipment

Model Number Matrix

CHEM-FEED® Model Number

MD1	CHEM-FEED® Multi-Diaphragm Metering Pump			
Diaphragm and O-Rings Material				
V	DiaFlex® Diaphragms and TFE/P O-Rings (For all chemicals excluding caustic soda and aqueous ammonia)			
E	Flex-A-Prene® Diaphragms and EP O-Rings (For caustic soda and aqueous ammonia)			
Power Cord (Operating voltage requirement 96VAC to 264VAC)				
4	115V 50/60Hz, power cord NEMA 5/15 plug (US)			
5	230V 50/60Hz, power cord NEMA 6/15 plug (US)			
6	220V 50/60Hz, power cord CEE 7/V11 plug (EU)			
8	240V 50/60Hz, power cord AS 3112 plug (Australia/New Zealand)			
9	230V 50/60Hz, power cord BS 1363/A plug (United Kingdom)			
MD1	V	1	4	Sample Model Number

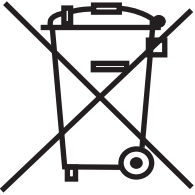
Accessories

 <p>KIT-S07 STAR III 7 GALLON TANK</p>	 <p>KIT-S15 STAR III 15 GALLON TANK</p>	 <p>KIT-S30 STAR III 30 GALLON TANK</p>	 <p>KIT-C5B 1/2" HOSE BARB</p>
 <p>KIT-MB FLOOR MOUNTING BRACKETS</p>	 <p>CABLE-UAC USB A-C CABLE</p>	 <p>KIT-M12 TWO M12 CABLES</p>	 <p>KIT-CQA QUICK CONNECT MD1 AFLAS</p>

NOTE: Accessories sold separately.

*KIT-M12-3 THREE M12 CABLES

*KIT-CQE EP O-RINGS



Users of electrical and electronic equipment (EEE) with the WEEE marking per Annex IV of the WEEE Directive must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, recovery of WEEE and minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. The WEEE marking applies only to countries within the European Union (EU) and Norway. Appliances are labeled in accordance with European Directive 2002/96/EC.

Contact your local waste recovery agency for a *Designated Collection Facility* in your area.

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