

## SERIES C2F / C3F

Operating Manual



**ProSeries**<sup>®</sup>  
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PLEASE READ ENTIRE INSTRUCTION MANUAL PRIOR TO INSTALLATION AND USE.

## 1.0 Introduction

Congratulations on purchasing Chem-Pro® variable speed Diaphragm Metering Pump. A diaphragm pump is a type of positive displacement pump used for pumping a variety of fluids.

Your Chem-Pro® pump is pre-configured for diaphragm, pump head and fittings that shipped with your metering pump.

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

## 1.1 Available Models

<b>C2F Diaphragm Metering Pump</b>					<b>Max. 166 Strokes Per Minute</b>		
<b>No Metal in fluid path</b>							
<b>Feed Rate at 0 PSIG</b>			<b>Max Pressure</b>	<b>Connection Type</b>	<b>C2F Model Numbers</b>		
<b>GPH</b>	<b>LPH</b>	<b>ML/Min</b>	<b>PSIG (bar)</b>	<b>Fittings</b>	<b>115V AC</b>	<b>230V AC</b>	<b>220V AC</b>
.06 - 6.0	.22 - 22	3.60 - 360	175 (12)	1/2" Male NPT / PVDF	C2F243XVA	C2F253XVA	C2F263XVA
.06 - 6.0	.22 - 22	3.60 - 360	175 (12)	1/2" Female NPT / PVDF	C2F243XVB	C2F253XVB	C2F263XVB
.06 - 6.0	.22 - 22	3.60 - 360	175 (12)	1/2" Hose Barb / PVDF	C2F243XVC	C2F253XVC	C2F263XVC
.06 - 6.0	.22 - 22	3.60 - 360	175 (12)	3/8" Tube compression/ PVDF	C2F243XVD	C2F253XVD	C2F263XVD
.10 - 10	.38 - 38	5.50 - 550	175 (12)	1/2" Male NPT / PVDF	C2F241XVA	C2F251XVA	C2F261XVA
.10 - 10	.38 - 38	5.50 - 550	175 (12)	1/2" Female NPT / PVDF	C2F241XVB	C2F251XVB	C2F261XVB
.10 - 10	.38 - 38	5.50 - 550	175 (12)	1/2" Hose Barb / PVDF	C2F241XVC	C2F251XVC	C2F261XVC
.10 - 10	.38 - 38	5.50 - 550	175 (12)	3/8" Tube compression/ PVDF	C2F241XVD	C2F251XVD	C2F261XVD
.15 - 15	.55 - 55	9.20 - 920	175 (12)	1/2" Male NPT / PVDF	C2F242XVA	C2F252XVA	C2F262XVA
.15 - 15	.55 - 55	9.20 - 920	175 (12)	1/2" Female NPT / PVDF	C2F242XVB	C2F252XVB	C2F262XVB
.15 - 15	.55 - 55	9.20 - 920	175 (12)	1/2" Hose Barb / PVDF	C2F242XVC	C2F252XVC	C2F262XVC
.15 - 15	.55 - 55	9.20 - 920	175 (12)	3/8" Tube compression/ PVDF	C2F242XVD	C2F252XVD	C2F262XVD

<b>C3F Diaphragm Metering Pump</b>					<b>Max. 130 Strokes Per Minute</b>		
<b>No Metal in fluid path</b>							
<b>Feed Rate at 0 PSIG</b>			<b>Max Pressure</b>	<b>Connection Type</b>	<b>C3F Model Numbers</b>		
<b>GPH</b>	<b>LPH</b>	<b>ML/Min</b>	<b>PSIG / bar</b>	<b>Fittings</b>	<b>115V AC</b>	<b>230V AC</b>	<b>220V AC</b>
.25 - 25	.96 - 96	16.00 - 1600	150 / 10.3	1/2" Male NPT / PVDF	C3F241XVA	C3F251XVA	C3F261XVA
.25 - 25	.96 - 96	16.00 - 1600	150 / 10.3	1/2" Female NPT / PVDF	C3F241XVB	C3F251XVB	C3F261XVB
.25 - 25	.96 - 96	16.00 - 1600	150 / 10.3	1/2" Hose Barb / PVDF	C3F241XVC	C3F251XVC	C3F261XVC
.40 - 40	1.53 - 153	25.50 - 2550	100 / 6.8	1/2" Male NPT / PVDF	C3F242XVA	C3F252XVA	C3F262XVA
.40 - 40	1.53 - 153	25.50 - 2550	100 / 6.8	1/2" Female NPT / PVDF	C3F242XVB	C3F252XVB	C3F262XVB
.40 - 40	1.53 - 153	25.50 - 2550	100 / 6.8	1/2" Hose Barb / PVDF	C3F242XVC	C3F252XVC	C3F262XVC

•Chem-Pro® Pumps motor speed is linear over the entire 1% to 100% adjustment range.

•Output versus pressure is nearly linear in all models.

•Feed rates taken in laboratory environment with clean water after 20 minute diaphragm break-in period with a 3 foot (1 meter) suction lift.

### Optional Extended Brackets

Stainless Steel extended brackets allow pump to be securely mounted to most any surface; floor, shelf, or skid. Brackets lift pump up 4-1/2 inches (11.43 cm), for easy pump access in hard to reach areas.

- Raise metering pump 4-1/2 inches (11.43 cm) off ground or a surface.
- Made out of tough Stainless Steel.
- Provides a stable mounting surface.

<b>Model #</b>	<b>Description</b>
72000-380	Extended Mounting Bracket, 1 Pair, SS, 4 SS Screws



## 2.0 Specifications

### Maximum working pressure\*:

175 psig (12 bar), \*model specific  
Note: see individual pump model maximum pressure ratings.

### Maximum Fluid temperature (excluding pump tubes):

130° F (54° C)  
Note: see individual pump tube assembly maximum temperature ratings.

### 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)

### 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 (USA)  
220V50Hz = CEE 7/VII (EU)  
240V50Hz = AS 3112 (Australia/New Zealand)

### Motor:

Brushed DC, 1/8 H.P.

### Duty cycle:

Continuous

### Motor speed adjustment range 100:1:

1.0% - 100% motor speed (1.3 to 130 RPM)

### Motor speed adjustment resolution:

0.1% increments

### Accuracy:

+/- 2% of full scale  
Repeatability +/- 0.5%

### Display

Backlit LCD, UV resistant.

### Keypad

Four button positive action tactile switch keypad.

### Enclosure:

NEMA 4X (IP66), Powder coated aluminum.  
Maximum overall dimensions:  
C2 models: 11-3/4"W x 7-3/4"H x 10-3/4"D (298W x 197H x 274D mm)  
C3 models: 13-1/8"W x 9"H x 10-3/4"D (333W x 228H x 274D mm)

### Approximate shipping wt:

C2 models: 24 lb. (10.9 Kg)  
C3 models: 29 lb. (13.1 Kg)

## 2.1 Materials of construction

### Wetted components:

#### Pump Head Assembly:

Pump Head: .....PVDF  
Adapter Connections: .....PVDF  
Prime/Degassing Valve: .....PVDF  
Valve Cartridges: .....PVDF  
Valve Balls: .....Ceramic  
Valve Ball Seats: .....TFE/P  
Tetrafluorethylene/propylene  
Static Seals: .....Viton® (optional EP)  
Diaphragm: .....PTFE® coated Hypalon®

#### Injection / Back-flow Check valve:

Body & insert: .....PVDF  
Check Ball: .....Ceramic  
Spring: .....Hastelloy C-276  
O-ring seals: .....Viton® (optional EP)

#### Foot Valve / Strainer:

Body & Adapter: .....PVDF  
Check Ball: .....Ceramic  
Spring: .....Hastelloy C-276  
O-ring seals: .....Viton® (optional EP)  
Filter screen: .....Polypropylene

Suction Tubing: .....Clear PVC (if supplied)

#### Discharge Tubing

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

### Non-Wetted components:

#### Enclosure:

413 Aluminum (Polyester powder coated)

#### Pump Head Cover:

413 Aluminum (Polyester powder coated)

#### Cover Screws:

300 Series Stainless Steel

#### DFD System Sensor pins:

Hastelloy C-276

#### Power Cord:

3 conductor, SJTW-A Water-resistant

#### Mounting Brackets and Hardware:

316 Series Stainless Steel

### 3.0 Features

Motor driven diaphragm pump offers smooth and quiet chemical dosing. No hard pulses as seen with solenoid driven pumps.

Full stroke every time avoids vapor lock.

Variable speed DC motor.

Rated for continuous duty (24X7).

PVDF / PTFE / Ceramic pump head components.

Diaphragm Failure Detection (DFD) system. Senses diaphragm failure by detecting chemical in pump head.

Backlit LCD displays motor speed, input signal values, service and alarm status.

CNC precision machined cam and piston for optimum efficiency, unparalleled accuracy, and linearity.

Heavy duty PVDF pump head and valves are standard.

Priming valve built directly into pump head.

Compatible with Blue-White's output Flow Verification Sensor (FVS) system.

### 3.1 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.




Symbol	Explanation
	WARNING, risk of electric shock
	CAUTION, refer to users' 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.

## 4.0 Installation

<b>CAUTION</b> 	Risk of chemical overdose. Be certain pump does not overdose chemical during backwash and periods of no flow in circulation system.
<b>CAUTION</b> 	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.
<b>CAUTION</b> 	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.

### 4.1 Mounting Location

Choose an area located near chemical supply tank, chemical injection point, and electrical supply. Install pump where it can be easily serviced.

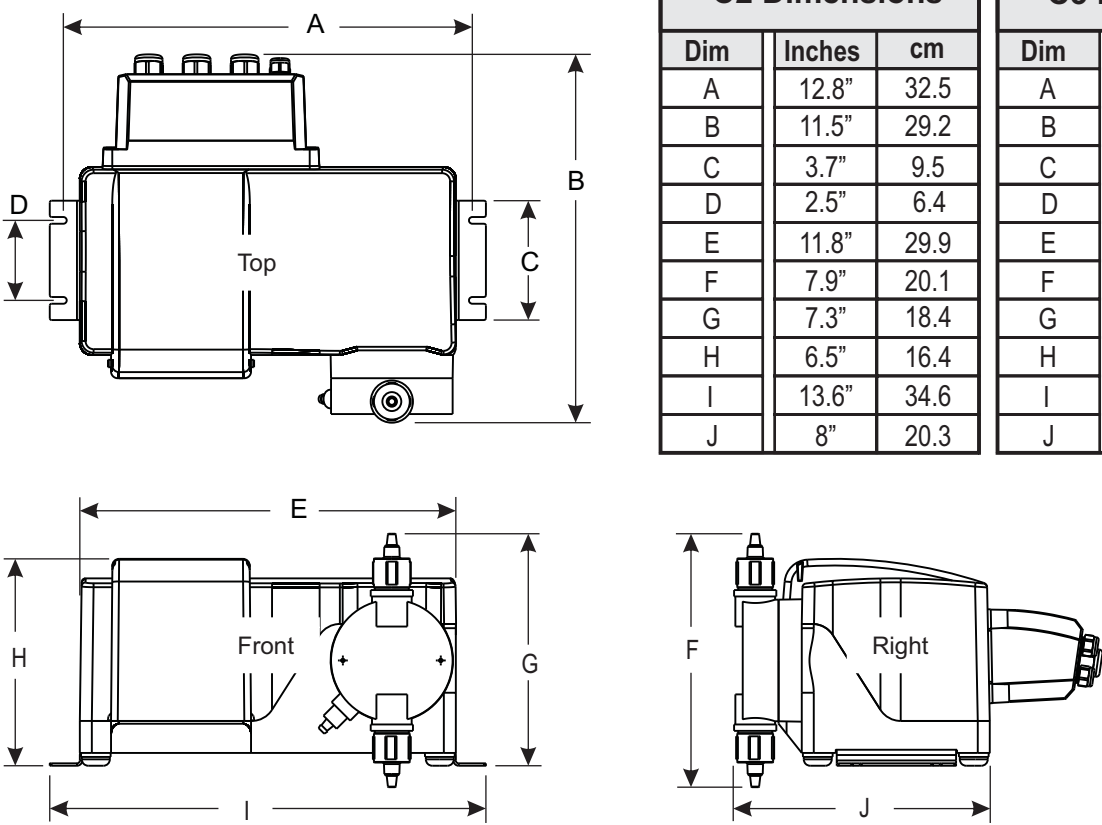
316SS Mounting brackets are included. Mount pump to a secure surface using enclosed mounting hardware.

Mount pump close to injection point. Keep inlet (suction) and outlet (discharge) tubing as short as possible. Longer discharge tubing increases back pressure at pump head.

**Important!** Install a back flow prevention check valve at discharge side of pump to prevent system fluid from flowing back through pump during pump maintenance. **Important!**

A pressure relief valve is recommended at discharge of pump.

### 4.2 Dimensions



The technical drawing shows three views of the metering pump: a top view, a front view, and a right-side view. Dimension lines A through J indicate various measurements. The top view shows dimensions A (width), B (height), C (depth), and D (mounting bracket height). The front view shows dimensions E (width), F (height), G (total height with bracket), and I (width to center). The right-side view shows dimension J (width).

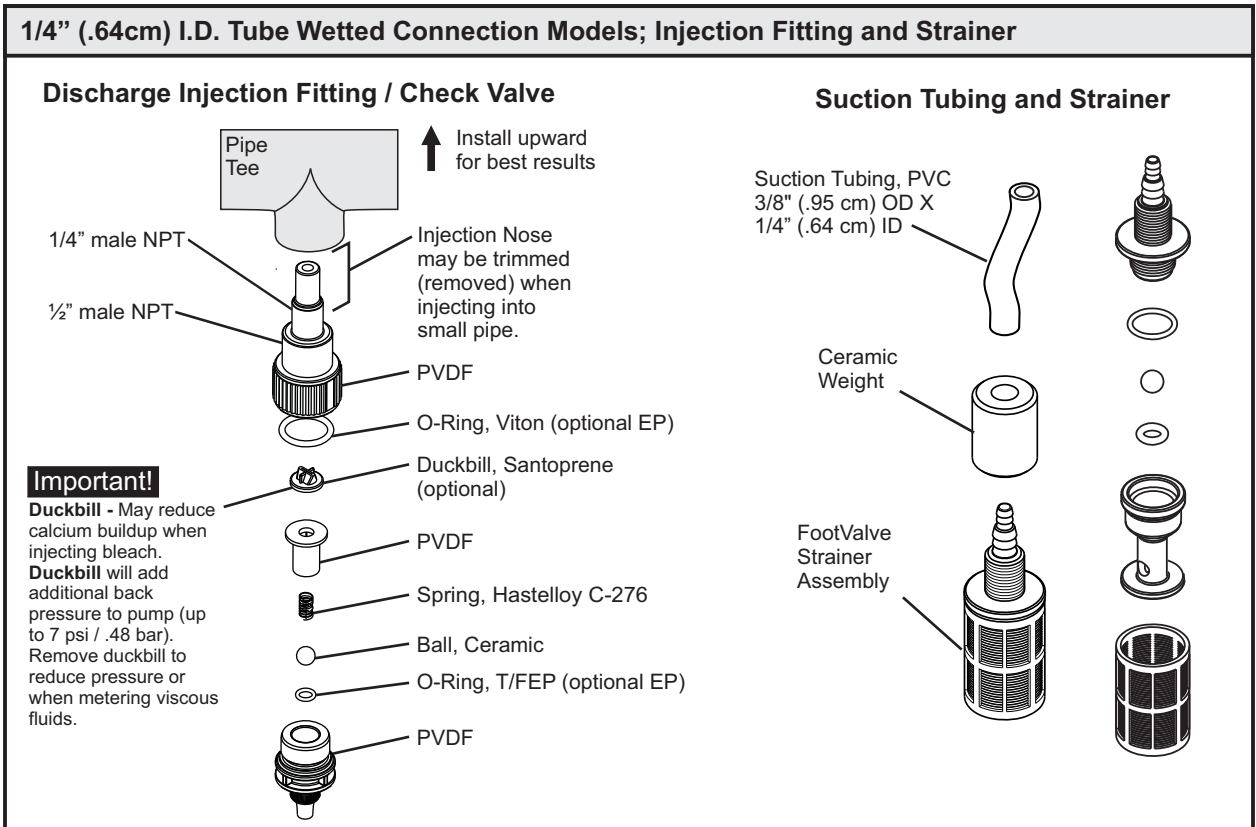
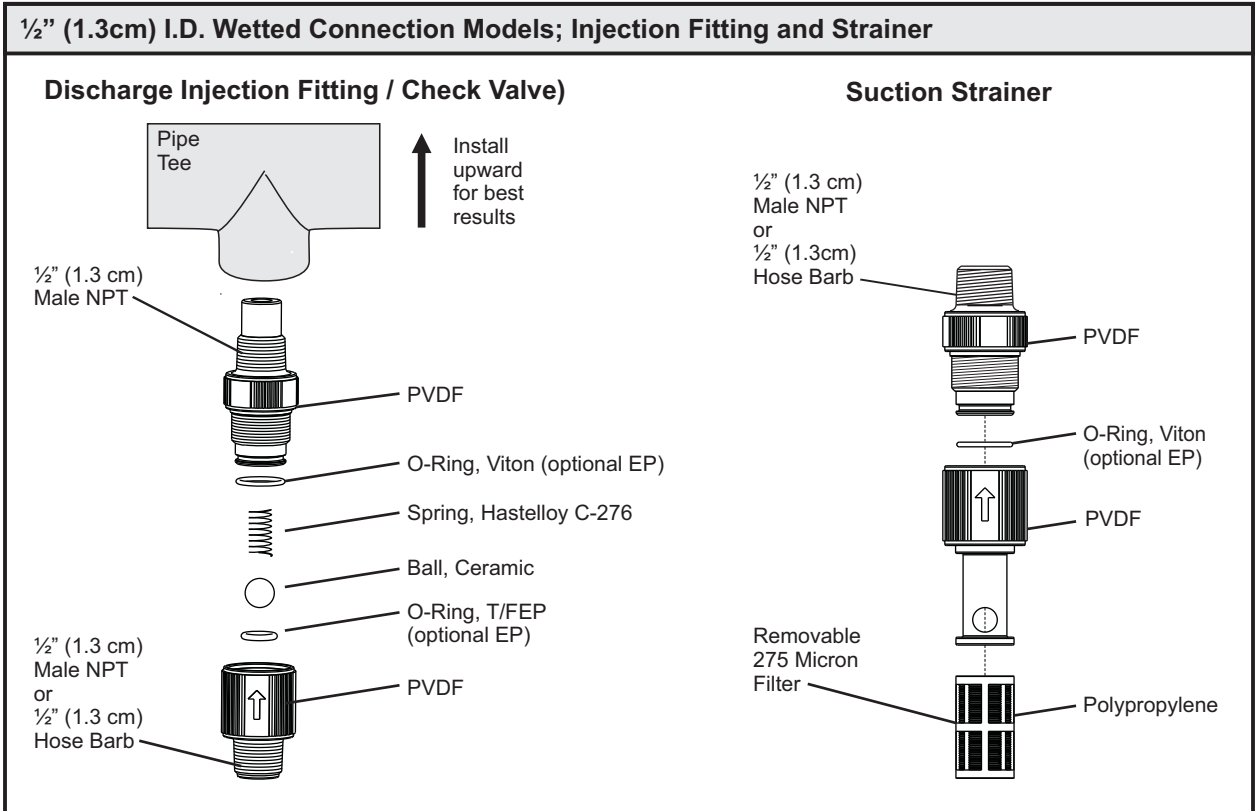
C2 Dimensions			C3 Dimensions		
Dim	Inches	cm	Dim	Inches	cm
A	12.8"	32.5	A	14.1"	35.8
B	11.5"	29.2	B	12"	30.5
C	3.7"	9.5	C	3.7"	9.5
D	2.5"	6.4	D	2.5"	6.4
E	11.8"	29.9	E	13.1"	33.2
F	7.9"	20.1	F	9"	22.9
G	7.3"	18.4	G	7.8"	19.8
H	6.5"	16.4	H	6.5"	16.4
I	13.6"	34.6	I	15"	38
J	8"	20.3	J	8"	20.3

**Note:** Optional Extended Bracket adds 4.5" (11.43cm) to overall height (dimension G and H). See page 3 for details.




### 4.3 Installing Injection Fitting and Strainer

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

**CAUTION** This Pump Has Been Evaluated for Use with Water Only.



## 5.0 Power Connections

<b>WARNING</b> 	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.
<b>WARNING</b> 	Electrical connections and grounding (earthing) must conform to local wiring codes. Be certain that a grounding conductor is connected to terminal T11-1 located in wiring compartment.
<b>WARNING</b> 	Risk of electric shock - Disconnect electricity before removing wiring compartment cover.

Be certain to connect pump to proper supply voltage. Using incorrect voltage will damage pump and may result in injury. Voltage requirement is printed on pump serial label.

Input power: 115VAC 50/60 Hz 1.5 amp or 230/240VAC 50/60 Hz 0.7 amp.

Power switch located in Junction Box.

Use voltage your power cord is rated for.

Cord connected models are supplied with a ground wire conductor and a grounding type attachment plug (power cord). To reduce risk of electric shock, be certain that power cord is connected only to a properly grounded, grounding type receptacle.

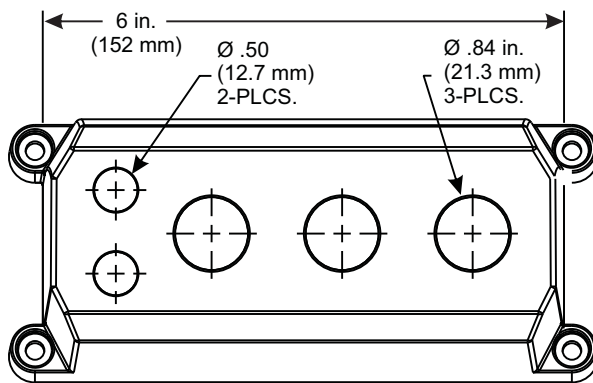
Permanently connected models must be properly grounded. Be certain that a grounding conductor is connected to terminal T11-1 located in wiring compartment.

Never strap control (input / output) cables and power cables together.

**Power Interruption:** This pump has an auto-restart feature which will restore pump to operating state it was in when power was lost.

**Note:** When in doubt regarding your electrical installation, contact a licensed electrician.

### WIRING COMPARTMENT COVER



### POWER CORD OPTIONS

Four power cord plug types available.  
Power cord length is 6 feet (3.83 meters)



115V 60Hz  
NEMA 5/15 (USA)  
max: 125V AC

230V 60Hz  
NEMA 6/15 (USA)  
max: 250V AC

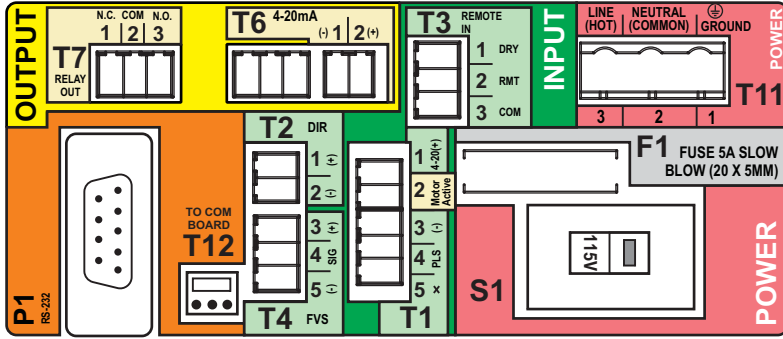
240V 50Hz  
CEE 7/VII (EU)  
max: 250V AC

### Included cable and conduit connectors:

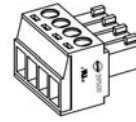
QTY.	DESCRIPTION
Qty: 2	- .50 Inch (12.7 Mm) Liq-tight Hole Plugs (mat'l = Neoprene), Pre-installed
Qty: 2	- .875 Inch (22.2 Mm) Liq-tight Hole Plugs (mat'l = Neoprene), 2 Pre-installed
Qty: 2	- .50 Inch (12.7 Mm) Liq-tight Connectors For Pass Thru Cords (mat'l = Nylon) Acceptable Cable Diameter .118 To .255 Inch (3.0 To 6.5 Mm), Not Installed
Qty: 2	- .875 Inch (22.2 Mm) Liq-tight Connectors For Pass Thru Cords (mat'l = Nylon) Acceptable Cable Diameter .200 To .395 Inch (5.1 To =10.0 Mm), 1 Pre-installed With Power Cord Models
Qty: 1	- Metallic Liq-tight Connectors For .50 Inch Flexible Conduit (mat'l = Die Cast Zinc), Not Installed



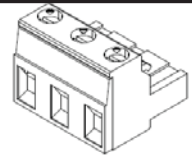
### 5.1 Wiring Terminals and I/O Schematics



**WARNING** Risk of electric shock - All wiring must be insulated and rated 300V minimum.



Terminals T1 Thru T8 Plug type 16 - 24 AWG



Power Input Terminal T11 Plug type 14 - 30 AWG

Shielded cables should be used on all input signal wires.

FUNCTION	TERM	PIN #	RATING	ELECTRICAL SP.	BLOCK DIAGRAM
INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FV SENSOR ONLY	T4	3	(+) POSITIVE		
	T4	4	SIGNAL		
	T4	5	(-) NEGATIVE		
INPUT: FVS SYSTEM (FLOW VERIFICATION SENSOR) FS or FP MICRO-FLO FLOW METER ONLY	T4	4	SIGNAL		
	T4	5	(-) NEGATIVE		
	T4	5	(-) NEGATIVE		
INPUT: REMOTE START / STOP (DRY CONTACT C.)	T3	1	(+) POSITIVE	NO VOLTAGE	
	T3	2	(-) NEGATIVE		
INPUT: REMOTE START / STOP (WET CONTACT C.)	T3	2	(+) POSITIVE	6 TO 30 VOLT DC 1 AMP MAX.	
	T3	3	(-) NEGATIVE		
OUTPUT: RELAY, 3 AMP	T7	1	NORM. CLOSED	Form C 3 AMP MAX AT 250 VAC, 3 AMP MAX AT 30 VOLT DC	
	T7	2	COMMON		
	T7	3	NORM. OPEN		
INPUT: POWER	T11	1	GROUND	115V OR 230V AC MANUAL SWITCH 50 / 60 HZ 100W	
	T11	2	NEUTRAL		
	T11	3	LINE (HOT)		
FUSE	F1	N/A	5 AMP	5A SLOW BLOW (20 X 5MM)	

## 6.0 How to Operate Chem-Pro® - Control Pad



### Press and release

Press UP arrow to increase pump speed (output) in Manual Operation.  
To increase value while in programming mode.



### Press and release

Press DOWN arrow to decrease pump speed (output) in Manual Operation.  
To decrease value while in programming mode.



### Press and release

To Stop pump at any time.

### Press and release

To Start pump.  
To begin listening (reacting) to external signal, such as Remote Start/Stop.



### Press and hold

To enter programming mode.

- Remote Start/Stop setup
- FVS (flow verification sensor) setup

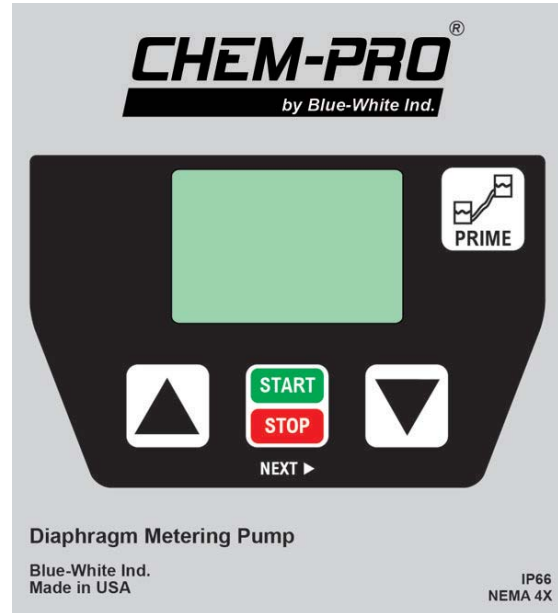
### Press and release

To save setting while in programming mode.  
To move to **next** selection while in programming mode.



### Press and release

To prime pump (60 seconds) – See page 17



**Time-out** - Chem-Pro® pumps have a time-out setting of approximately 20 seconds while in configuration menu. If built-in timer exceeds 20 seconds without a button being pressed, then pump will exit configuration menu. Changes will only be saved after START | STOP button is pressed and released.



## 7.0 Set Remote Start / Stop

Used to remotely start and stop pump using a dry contact closure signal.  
When activated; CLOSE = START and OPEN = STOP.

Set to NO = Remote Start / Stop is disabled  
Set to Yes = Remote Start / Stop is enabled

Can be used with external foot pedal, PLC, contact closure or other similar external devices.

Default setting = No (disabled)

### Step 1

Press and release STOP button

Note: Cannot enter programming mode while pump is running.



### Step 2

Press and hold START | STOP button until 'Remote' icon begins flashing.

Default setting 'NO' will also be visible when entering remote start / stop setup.

Note: If 'YES' had been selected previously, then 'YES' will be displayed on screen.

Remote  
Icon



### Step 3

Press and release DOWN arrow to change setting to 'YES.'

To change setting back to 'NO' press and release UP arrow.



### Step 4

After you've made your selection, press and release START | STOP button. This saves your setting.

You can now modify FVS setting (see next page) or you can exit Setup by pressing and holding START | STOP button for a few seconds until you return to Run screen.



Running pump with Remote Start / Stop enabled, 'REMOTE' icon will always be visible on lower left side of screen.  
Pump will display 'STBY' (standby) if pump is in stop mode via contact closure signal. **Please use caution in this mode, pump can start at anytime. If you must perform maintenance to pump, press and release STOP button.**

## 7.1 Set FVS (flow verification system)

Flow verification sensor sold separately.

Flow verification system is designed to stop pump in an event sensor does not detect flow during pump operation. Indicating an empty chemical tank, clogged injection fitting, loose tubing connection, etc.

To allow pump to clear any gasses that may have accumulated over time, an alarm delay time value from 1 to 255 seconds must be programmed.

Note: An alarm delay of 000 seconds disables FVS system.

### Step 1

Press and release STOP button

Note: Cannot enter programming mode while pump is in running.



### Step 2

Press and hold START | STOP button until 'Remote' icon begins flashing.

This indicates that you've entered Setup menu.

Remote  
Icon



### Step 3

Press and release START | STOP button to scroll through menu until you see FVS icon.

If you pass FVS screen, continue to press and release START | STOP button until FVS icon appears.



### Step 4

FVS icon will appear for 1 second, followed by numbers.

These numbers indicate delay time setting for FVS.

Select a delay time in seconds. Delay time is amount of time pump will wait to receive a pulse from sensor until an alarm is triggered.

A delay time of 00 deactivates FVS feature.



### Step 5

After you've made your selection, press and release START | STOP button. This saves your setting.

Press and hold START | STOP button to exit Setup menu and return to runtime screen.



**Time-out** - Chem-Pro pumps have a time-out setting of 20 seconds while in configuration menus. If built-in timer exceeds 20 seconds without a button being pressed, then pump will exit configuration menu. Changes will only be saved after RIGHT arrow button is pressed and released.

## 7.1 Set FVS (flow verification system) - Continued

Flow Verification Sensor is designed to give you two installation options.

Sensor can be installed:

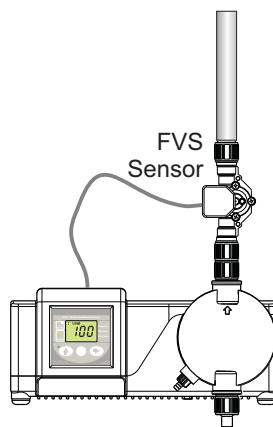
- Directly onto pumphead of Chem-Pro® pump, discharge side.
- Anywhere on discharge side of Chem-Pro® pump.

Wiring for sensor can be connected directly to a Chem-Pro® pump. Pump will stop pumping if sensor detects no flow. A relay will then close allowing for remote alarm indication or initiation of a back-up pump. **Install FVS Flow Sensor** - Flow Verification Sensor should be installed on inlet (suction) side of pump tube.

When installing directly onto pump 3/8" tube discharge fitting:

Sensor includes a PVC tubing insert, located inside sensors female thread connection, that is designed to seal sensor onto pump tube adapter. Thread sensor onto pump tube until tubing insert is snug against pump tube fitting - do not over-tighten.

Sensor Model Number	Published Flow Range	Actual Working Range with Chem-Pro® Pump
	ML/Min	ML/Min
FV-100	30-300	30-200
FV-200	100-1000	50-900
FV-300	200-2000	100-1800
FV-400	300-3000	300-3000
FV-500	500-5000	500-5000
FV-600	700-7000	700-7000



**Confirm FVS flow range** - Flow Verification Sensor (FVS) will only function within its operating range. See chart for available ranges.

NOTE: If pump output is less than 30 ml/min, sensor will not detect chemical and a signal will not be sent to pump, resulting in an alarm condition.

NOTE: For low viscosity (water-like) fluids only. Consult factory if attempting to use with viscous fluids.

## 8.0 Manual Operation

Used to manually control speed of pump.

Use UP and DOWN arrows to adjust speed while pump is running.

To select exact run speed, follow steps below.

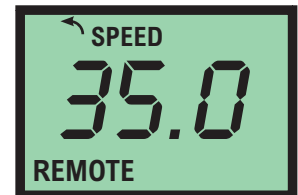
### Runtime Screen Shot 1

Displays motor speed percentage.  
Pump Running in Manual Operation



### Runtime Screen Shot 2

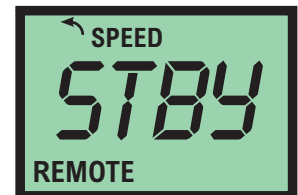
Displays motor speed percentage.  
Pump Running in Manual Operation with Remote Start /  
Stop enabled (see page 11).



### Runtime Screen Shot 3

Displays 'Stand-By' status with Remote start/stop enabled  
and waiting for signal to start.

**Caution**, pump can start up at anytime in this condition.  
Press STOP button before performing maintenance.



With pump operating in manual operation, pump speed can be changed at anytime by using UP or DOWN arrows during operation.

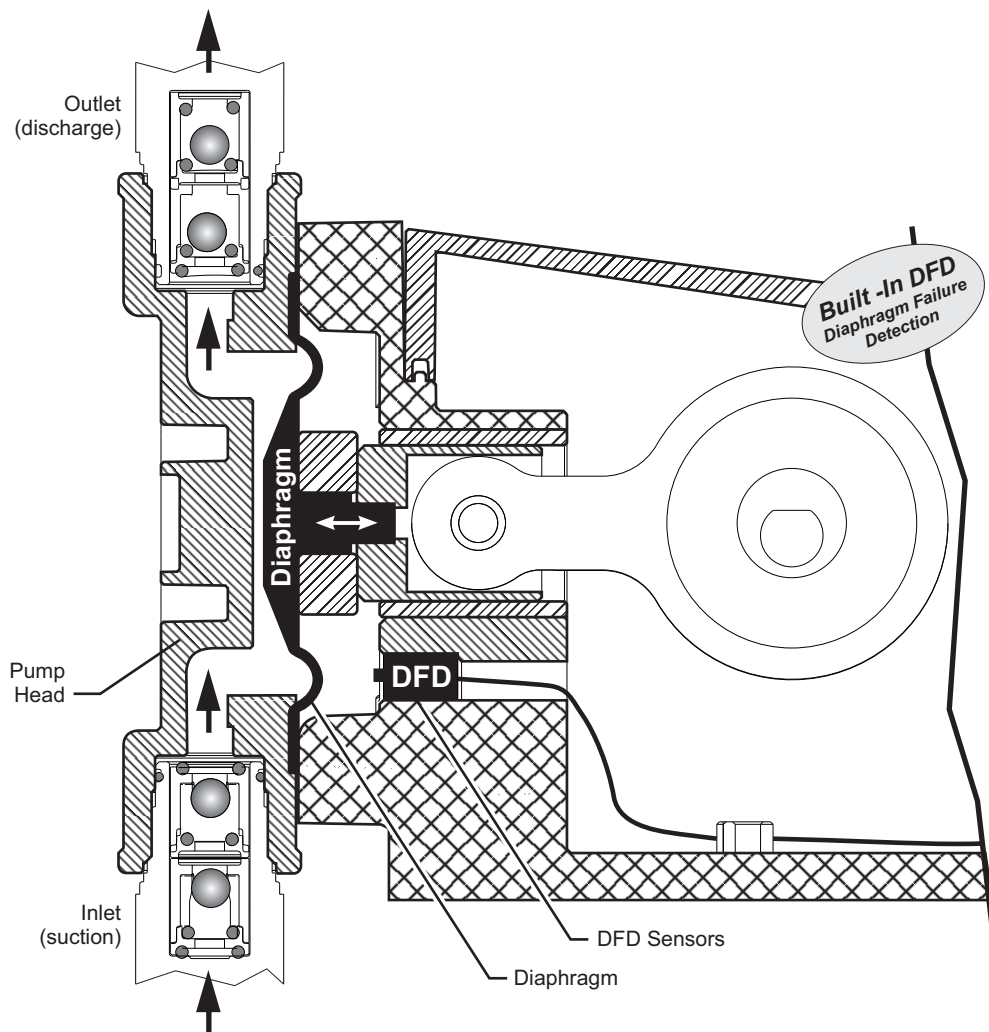
## 9.0 DFD (Diaphragm Failure Detection)

Chem-Pro® 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. Pump will detect a chemical with a conductivity reading greater than 500 microsiemens. Chemicals with a conductivity of less than 500 microsiemens will not be detected.

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.



## 10.0 Alarm Relay

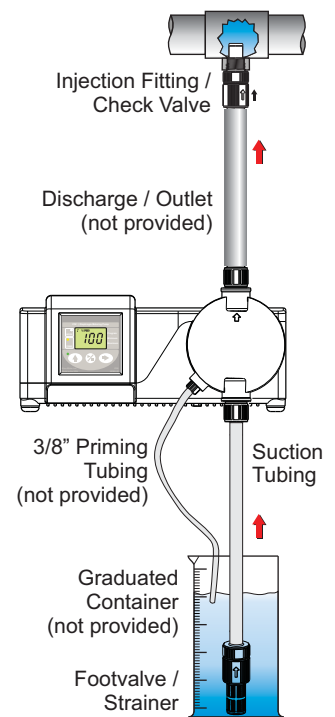
Pump has a built in 3 amp alarm output relay. Relay is pre-configured to energize on diaphragm failure detection (DFD) and on Flow Verification Sensor (FVS).

A Flow Verification Sensor must be installed and configured for relay to trigger on no-flow conditions. See page 9 for wiring details.

## 11.0 Volumetric Test - Measuring Chem-Pro's Output

This volumetric test will take into account individual installation factors such as line pressure, fluid viscosity, suction lift, etc. This test is most accurate for measuring injector's output in an individual installation.

1. Be sure Injection Fitting and Footvalve / Strainer are clean and working properly.
2. Fill a large graduated cylinder with solution to be injected.
3. With pump installed under normal operating conditions, place suction tubing with Footvalve / Strainer installed in graduated cylinder.
4. Push 3/8" tubing onto priming valve. Place other side of 3/8" tubing in solution tank. Make sure priming valve is closed by turning valve to right.
5. Run pump until all air is removed from suction line and solution enters discharge tubing.  
If pump does not easily prime, loosen priming valve 1 - 2 turns counter clock wise. Once air is removed close priming valve.
6. Remove suction tubing from graduated cylinder and refill graduated cylinder if necessary. Note amount of solution in graduated cylinder.
7. Place suction tubing with Footvalve / Strainer installed back into graduated cylinder.
8. Run injector for a measured amount of time. A longer testing time will produce more accurate results.
9. Remove suction tubing from graduated cylinder. Measure amount of chemical injected.



### Example:

During your 1 minute calibration period, say Chem-Pro pumped 1000 Milliliters in 1 minute.

$$1 \text{ US Gallon} = 3.785 \text{ Liters} = 3785 \text{ Milliliters}$$

$$\left( \frac{1000 \text{ ML/Min}}{3785} \right) 60 = 15.85 \text{ GPH (US gallons per hour)}$$

Minutes per hour

Milliliters in a US gallon

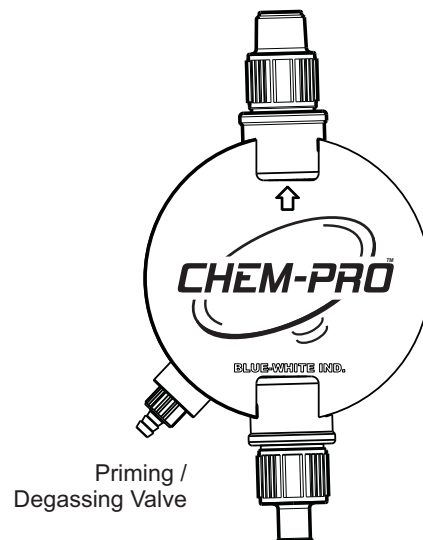
**Note:** All diagrams are strictly for guideline purposes only. Always consult an expert before installing pump into specialized systems. Pump should be **serviced by qualified persons only.**





## 12.0 Priming Pump

Priming is an essential part of proper pump functionality. It ensures pump head is devoid of air or gas. Fluid will escape from Priming/Degassing valve during priming so it is recommended that you attach tubing to barbed fitting and place opposite end in chemical tank.

1. Start by attaching 3/8" OD (1/4" ID) suction tubing to barbed fitting of priming/degassing valve.
2. Open valve by rotating it counter clockwise one quarter to one half turn.
3. Once valve is open, attach 3/8" OD (1/4" ID) suction tubing to barbed fitting and place opposite end of tubing into chemical tank.
4. Press and release prime button. Pump will then run for 60 seconds at 100% motor speed, evacuating air/gas from inside pump head.
5. Rotate priming/degassing valve clockwise to close.



## 13.0 Pump Maintenance

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

## 13.1 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.

Brush Kit Life Cycle over 3,000 hours of continuous use. A spare brush kit is located inside of pump housing.

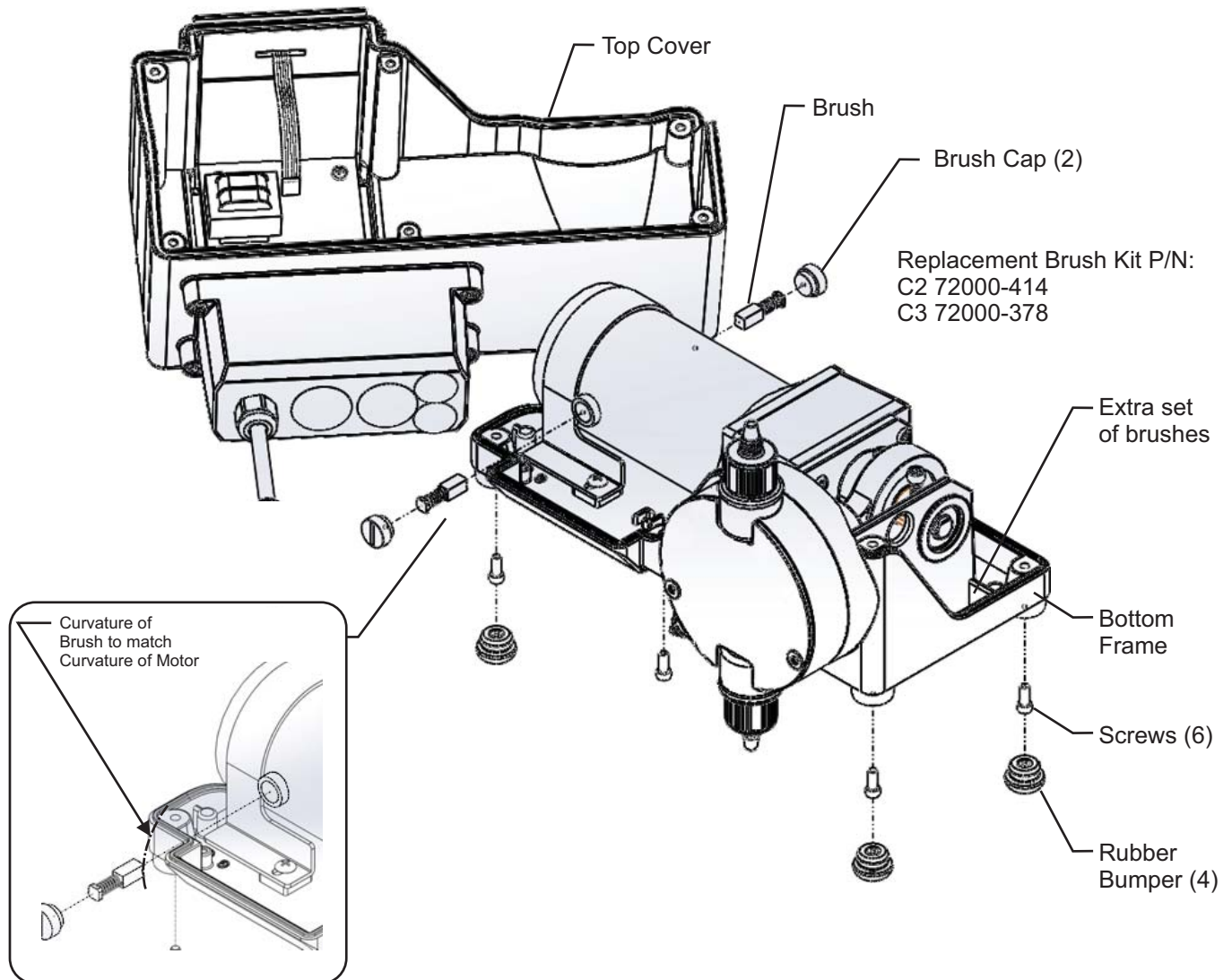
## 13.2 Cleaning Pump

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

- ☑ Inspect and replace pump head valves as required.
- ☑ When changing diaphragm, pump head chamber and pump head cover should be wiped free of any dirt and debris. The pump stroke must be FORWARD when screwing in the diaphragm and BACKWARD when installing and tightening the pump head.
- ☑ 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.

### 13.3 Motor Brush Replacement

Brushes wear differently on each side of motor. It is recommended to replace both brushes at the same time.



#### Step 1

Remove 4 black rubber bumpers from bottom frame.

#### Step 2

Remove 6 screws from underneath side of bottom frame.

#### Step 4

Lift off top cover from bottom frame carefully. Place top cover close to bottom frame.

*Please Note:* Wires connecting top and bottom may become unplugged if pulled too far apart.

#### Step 5

Unscrew and remove brush caps by turning counter-clockwise.

#### Step 6

Remove used brushes and discard properly.

#### Step 7

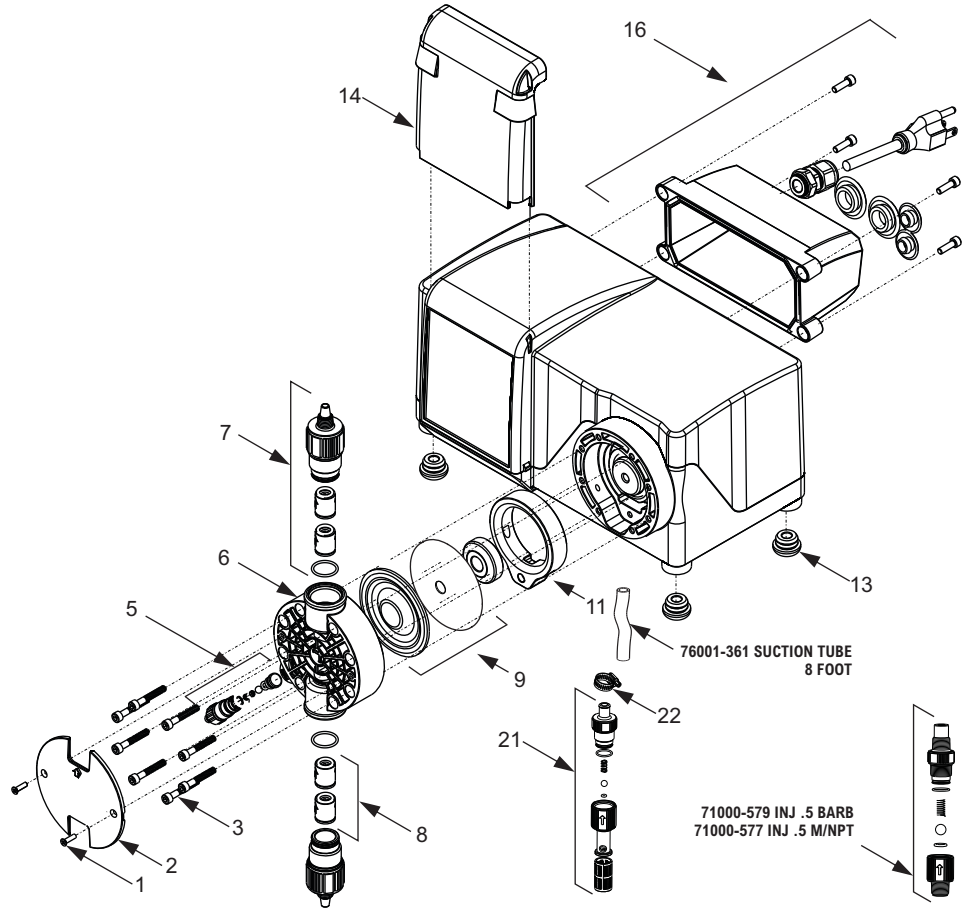
Insert new brushes. Be sure to install brushes to that curvature of brush is concentric to curvature of motor. Please note: One extra set of brushes are provided inside frame.

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## 14.0 Replacement Parts List

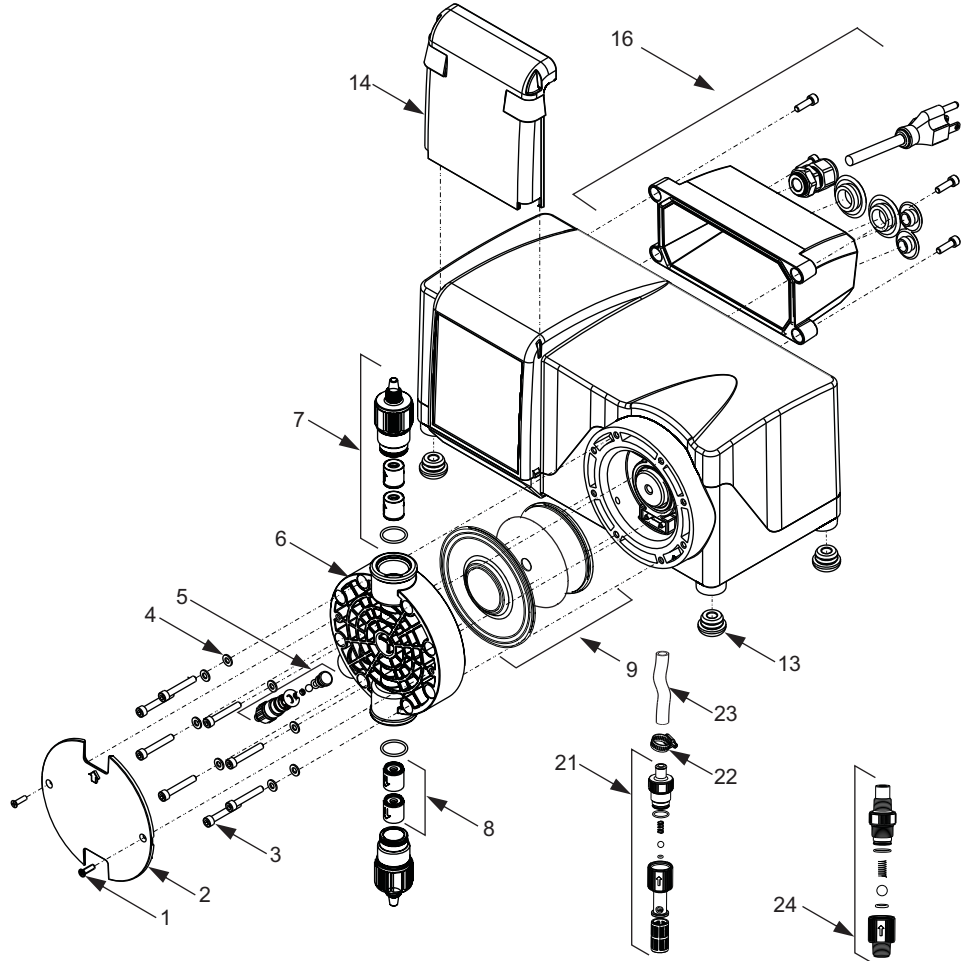
### 14.1 C2 Parts List

ITEM	PART NO.	DESCRIPTION	QTY REQ.
1	90011-081	SCREW 6-32 X .5	2
2	90001-170	COVER P/H C2	1
	90001-171	COVER P/H NO LOGO	1
3	90011-181	SCREW 10X32 X 1.25	8
5	70001-353	PRIME VALVE VITON®	1
	70001-354	PRIME VALVE EP	
6	76200-092	P/HEAD LG C2 KYNAR	1
	76200-093	P/HEAD SM C2 KYNAR	
7	70001-349	VALVE .5 M/NPT VIT	2
	70001-350	VALVE .5 M/NPT EP	
	70001-351	VALVE .5 F/NPT VIT	
	70001-352	VALVE .5 F/NPT EP	
	70001-347	VALVE .5 T-BARB VIT	
	70001-348	VALVE .5 T-BARB EP	
	70001-372	VALVE .375 TUBE VIT	
	70001-373	VALVE .375 TUBE EP	
8	20000-194	KIT 4 EA. VALVE VIT	1
	20000-195	KIT 4 EA. VALVE EP	
9	72000-297	SM DIAPH. KIT C2 KYNAR	1
	72000-296	LG DIAPH. KIT C2 KYNAR	
11	90001-173	P/HEAD LG. SPACER	1
	90001-172	P/HEAD SM. SPACER	
13	90003-561	BUMPER FEET	4
14	90002-326	UV LCD CVR PLYCRB	1
16	71010-027	J-BOX KIT W/ 115V	1
	71010-028	J-BOX KIT W/ 230V	1
	71010-029	J-BOX KIT W/ 220V	1
21	71000-575	FOOTVALVE .5 T CR VIT	1
	71000-447	FTVALVE .5 CR VT/AF NO SP	
	71000-325	FOOTVALVE .5 CR EP NO SP	
22	90008-043	CLAMP SS .5"	1



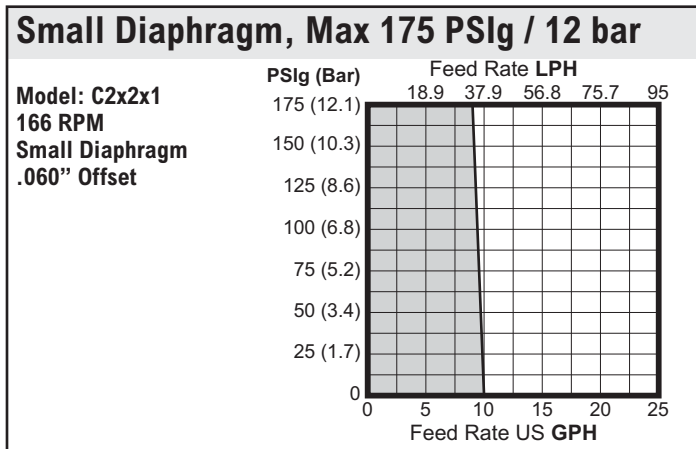
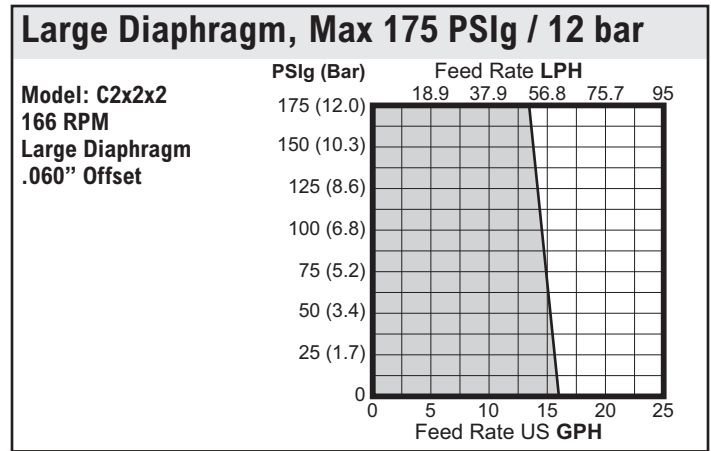
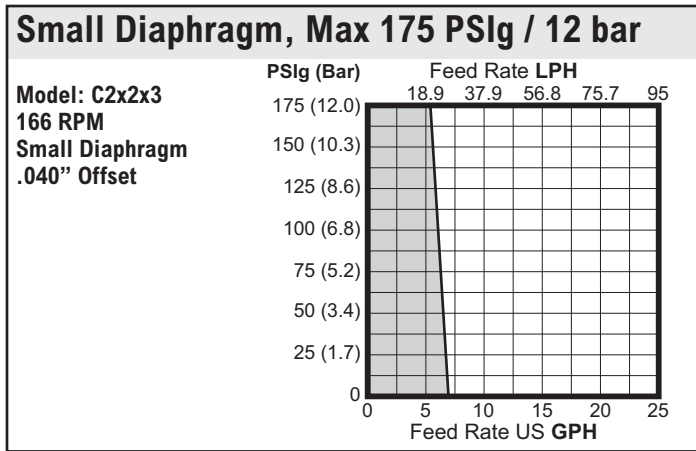
### 14.2 C3 Parts List

ITEM	PART NO.	DESCRIPTION	QTY REQ.
1	90011-081	SCREW 6-32 X .5	2
2	90001-157	COVER P/H C3	1
	90001-158	COVER P/H C3 NO LOGO	1
3	90011-181	SCREW 10X32 X 1.25	8
4	90011-049	WASHER #10 P/H SS	8
5	70001-353	PRIME VALVE VITON®	1
	70001-354	PRIME VALVE EP	
6	90002-258	P/HEAD LG C3 PVDF	1
7	70001-349	VALVE .5 M/NPT VIT	2
	70001-350	VALVE .5 M/NPT EP	
	70001-351	VALVE .5 F/NPT VIT	
	70001-352	VALVE .5 F/NPT EP	
	70001-347	VALVE .5 T-BARB VIT	
	70001-348	VALVE .5 T-BARB EP	
8	20000-194	KIT 4 EA. VALVE VIT	1
	20000-195	KIT 4 EA. VALVE EP	
9	72000-295	DIAPH. KIT C3 KYNAR	1
13	90003-561	BUMPER FEET	4
14	90002-326	UV LCD CVR PLYCRB	1
16	71010-027	J-BOX KIT W/ 115V	1
	71010-028	J-BOX KIT W/ 230V	1
	71010-029	J-BOX KIT W/ 220V	1
21	71000-575	FOOTVALVE .5 T CR VIT	1
	71000-447	FTVALVE .5 CR VT/AF NO SP	
	71000-325	FOOTVALVE .5 CR EP NO SP	
22	90008-043	CLAMP SS .5"	1
23	76001-361	TUBE SUCTION .5 D, 8' L	1
24	71000-579	INJECTION .5 BARB	1
	71000-577	INJECTION .5 M/NPT	

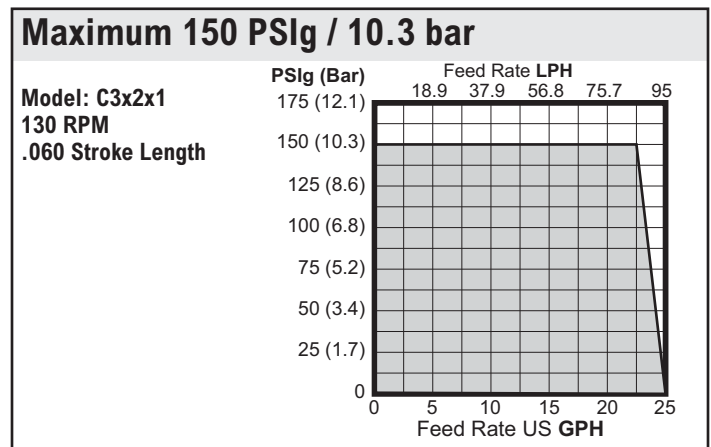
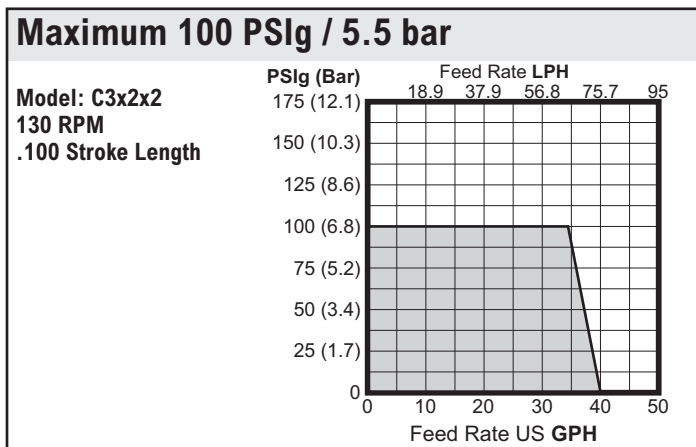


## 15.0 Output Versus Pressure

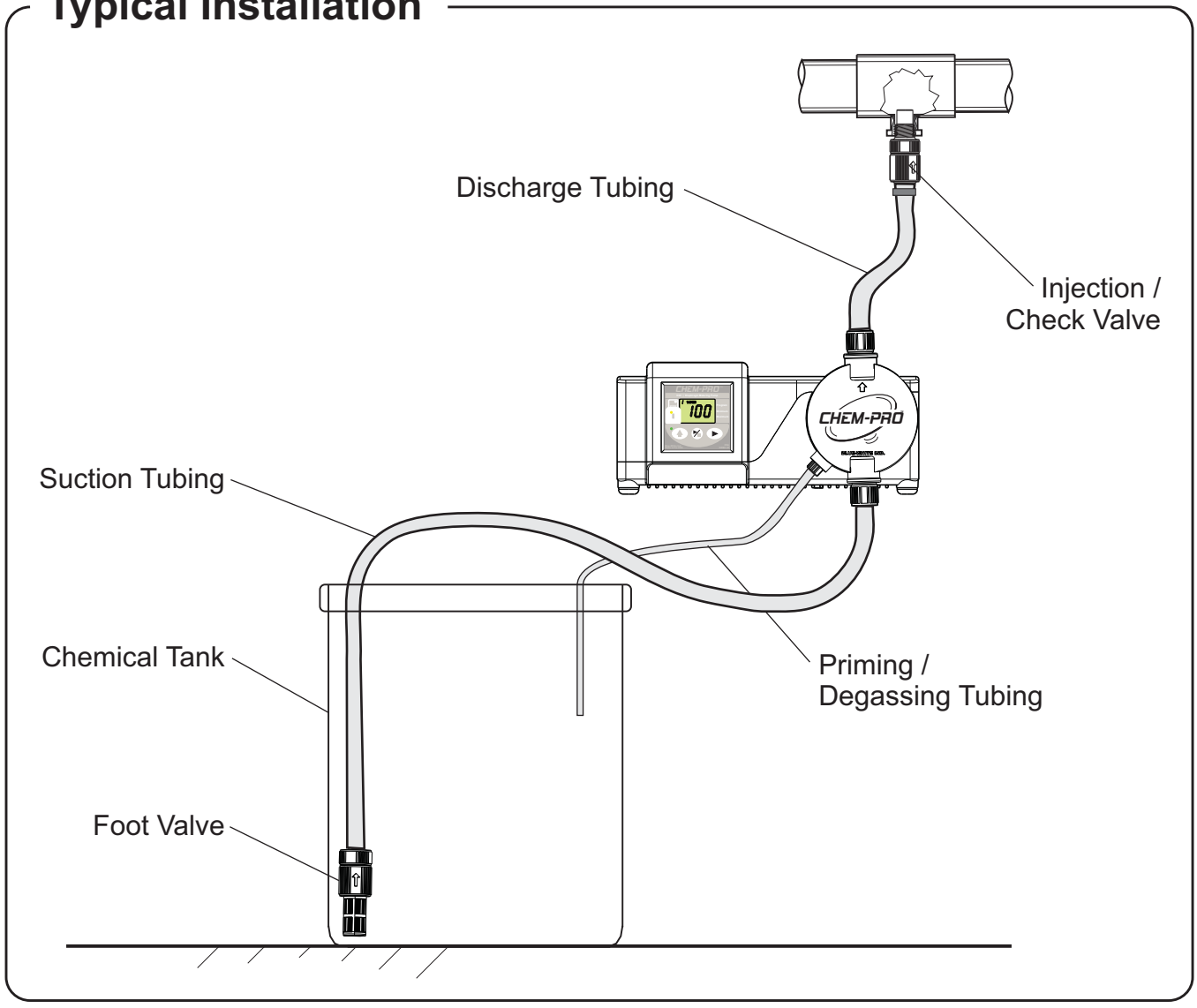
### 15.1 C2 Output V. Pressure



### 14.2 C3 Output V. Pressure



# Typical Installation



### LIMITED WARRANTY

Your new Clem-Pro pump is a quality product and is warranted for 24 months from date of purchase (proof of purchase is required). The pump will be repaired or replaced at our discretion.

### 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, or ProSeries service center.**
- **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 which is out of our control.**
- **Pumps damaged by faulty wiring, power surges or acts of nature.**

Blue-White Industries 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 manual.

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 legible. The warranty status of the pump will be verified by Blue-White Industries or a factory authorized service center.

### OTHER IMPORTANT WARRANTY INFORMATION

Please be advised; injection and metering devices are not intended as a means of treating water to render it suitable for human consumption. When used as hypochlorinators, they are meant to destroy bacteria and algae contamination, before its removal by filtration. Acid and soda injectors are used for PH control (balance). Blue-White Industries injectors are factory tested with water only for pressure and performance. Installers and operators of these devices must be well informed and aware of the precautions to be taken when injecting various chemicals -especially those considered hazardous or dangerous, eye protection must be worn when working around this product or any other metering type of pump.

Should it become necessary to return the pump for repair or service, you must attach information regarding the chemical used as some residue may be present within the unit which could be a hazard to service personnel.

Blue-White Industries will not be liable for any damage that may result by the use of chemicals with their injectors and its components. Thank you.

### PROCEDURE FOR 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.



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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