

# CHEM-PRO

Diaphragm  
Metering  
Pumps

by Blue-White Industries

**C3**  
Series



**Built -In DFD**  
Diaphragm Failure  
Detection  
(see page 7)

## Series **C3F** and **C3V**

Variable Speed

Positive Displacement Diaphragm Metering Pump

**ProSeries™**  
by Blue-White Ind.



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### Series Comparison:

Series	Junction Box	DFD (Leak Detection)	External Communications (input)					Output
			FVS** (Flow Verification)	4-20 mA	0-10 VDC	Pulsed*	Batch	Alarm Relay 3 Amp
<b>C3F</b>	Optional	✓	✓					✓
<b>C3V</b>	✓	✓	✓	✓	✓	✓	✓	✓

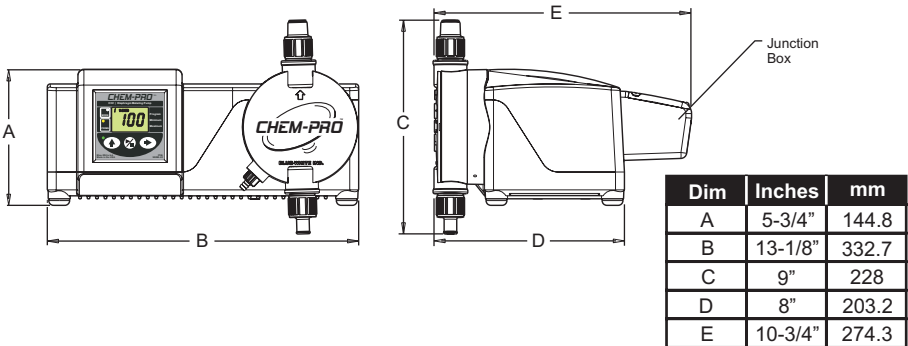
\* Also known as Frequency Mode  
 \*\* Requires Micro-Flo Sensor sold separately

## 1.0 Introduction

Congratulations on purchasing the C3 Diaphragm Metering Pump. The C3 is designed to inject chemicals into piping systems and is capable of injecting against a high system pressure up to 175 PSI / 12.1 bar\*.

## 2.0 Specifications

- Maximum Working Pressure\*** .....175 psig / 12.1 bar
- Maximum Fluid Temperature** .....130° F / 54° C
- Ambient Temperature Range** .....14 to 115° F / -10 to 46.1° C
- Output adjustment Range** .....1-100% in 1% increments
- Turn Down Ratio**..... 100:1
- Duty Cycle** .....Continuous
- Maximum Viscosity** .....1,000 Centipoise
- Maximum Suction Lift** .....15 ft. water / 4.5 m water
- Enclosure Rating** .....NEMA 4X / IP66
- Power Requirements** .....115v, 50/60Hz 1.5 Amp  
230v, 50/60Hz 0.7Amp
- Shipping Weight** .....29 lb. (approx.)
- Dimensions:**



## 3.0 Features

- Oversized PVDF double ball valves.
- Operator friendly digital touch pad.
  - Easy to read Back Lit LCD display
  - Display percentage of motor speed
- DFD, Built-in Diaphragm Failure Detection system.
- Priming / degassing valve built into the pumphead
- NEMA 4X and IP66 rated enclosure

\* Depending on model selection.

## 4.0 Unpacking

Your pump package should contain the following:

- 1 - Metering Pump
- 1 - 8 foot / 2.4 meter suction tube, clear PVC
- 1 - foot valve & strainer assembly
- 1 - Injection fitting with internal back-flow check valve
- 1 - Mounting hardware kit (two mounting brackets, 4 screws)
- 1 - 5 Foot / 1.5 meter Priming Tubing
- 1 - Extra Brush Kit (**located inside motor housing**)

## 5.0 Installation

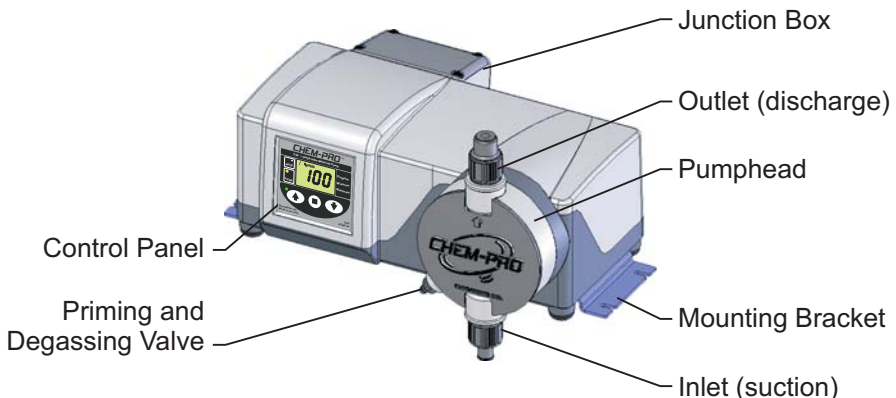
**CAUTION:** Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on the solution being pumped. Refer to MSDS precautions from your solution supplier.

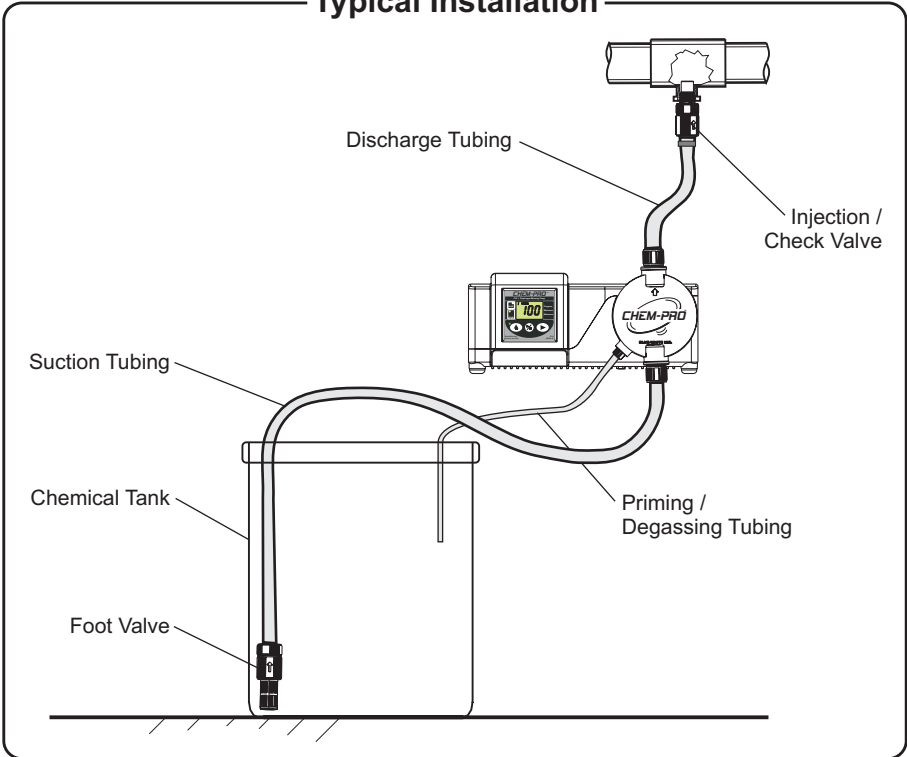
### 5.1 Mounting Location

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

- Mount the pump to a secure surface using the enclosed 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 the back pressure at the pump head.
- Your solution tank should be sturdy. Keep the tank covered to reduce fumes. Do not mount the pump directly over your tank. Chemical fumes may damage the unit. Mount the pump off to the side or at a lower level than the chemical container.
- Be sure your installation does not constitute a cross connection with the drinking water supply. Check your local plumbing codes.

### Parts Locator



**Typical Installation**

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

**Extended Brackets****Model Number 72000-380**

Blue-White's Stainless Steel extended brackets allow the pump to be securely mounted to most any surface; floor, shelf, or skid. The brackets lift the pump up 4-1/2 inches (11.43 cm), allowing you to easily connect the suction side of the pump to your solution.

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



Model #	Description
72000-380	Extended Mounting Bracket, 1 Pair, SS, 4 SS Screws

## 5.2 How To Install the Tubing and Fittings

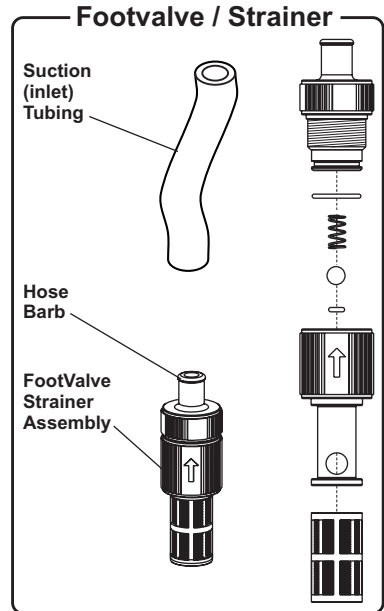
**CAUTION: Proper eye and skin protection must be worn when installing and servicing the pump and fittings.**

- **Suction (Inlet) Tubing**

Locate the inlet fitting of the pump head. Push the clear suction tubing onto the fitting barb.

- **Footvalve / Strainer**

Trim the inlet end of the suction tubing so that the strainer will rest approximately two inches from the bottom of the solution tank. This will prevent sediment from clogging the strainer. Press the strainer's barbed fitting into the end of the tube. Drop the footvalve / strainer into the solution tank.



- **Injection / Check Valve Fitting Installation**

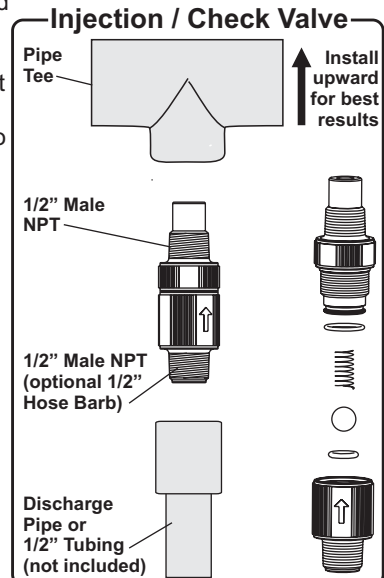
The Injection / Check valve fitting is designed to install directly into 1/2" female pipe threads. This fitting will require periodic cleaning, especially when injecting fluids that calcify such as sodium hypochlorite.

Install the Injection / Check valve directly into the piping system. **To prevent trapped gasses, install the fitting in an upward direction.** Use Teflon thread sealing tape on the pipe threads.

At high pressures, Blue-White recommends using a threaded connection.

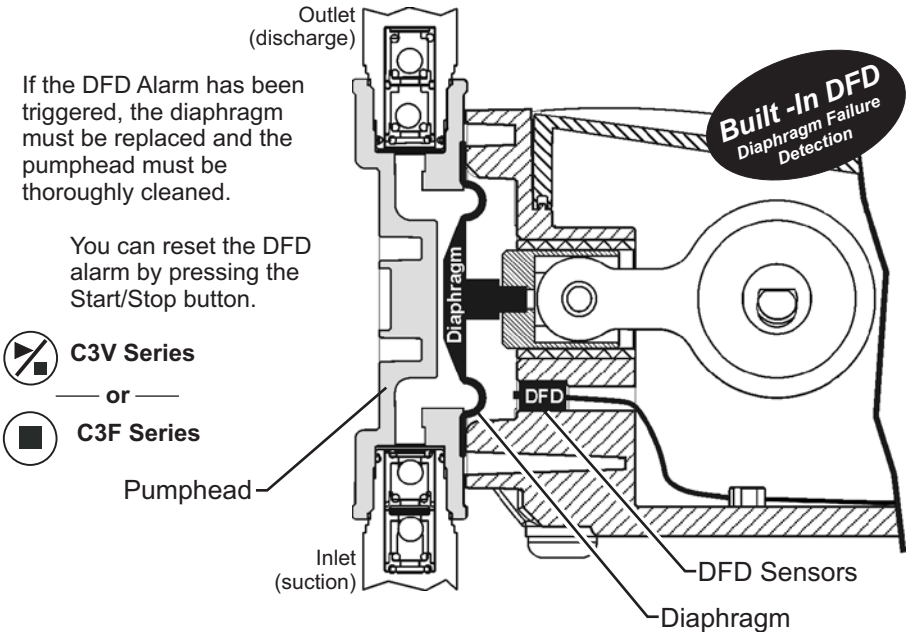
Injection / Check Valve is available with 1/2" Male NPT or 1/2" Hose Barb. This is based on the outlet connection selected for the C3 pump.

**Keep discharge (outlet) tube as short as possible.**



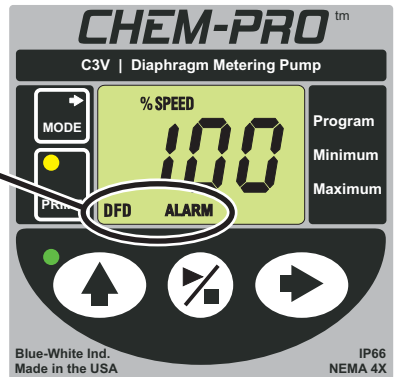
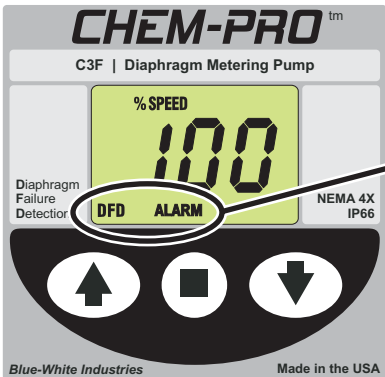
### 5.3 DFD (Diaphragm Failure Detection)

The C3 includes DFD sensors built directly into the pump. Although it doesn't happen often, diaphragm failure can occur. The DFD sensors will detect the chemical behind the diaphragm caused by diaphragm failure. The pump will then shut down and energize an internal 3 amp relay. You can wire the 3 amp relay to an alarm, SCADA system, backup pump, or nothing at all.



**C3F Display**

**C3V Display**



DFD ALARM icons

**If the DFD Alarm is triggered, the DFD and ALARM icons will begin flashing.**

*Note:* The DFD system will not reset until you have removed all traces of chemical from behind the diaphragm.

## 5.4 FVS - Flow Verification System - (sensor sold separately)

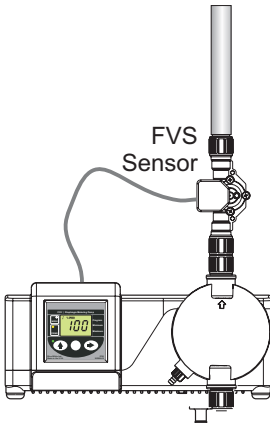
The C3 is equipped with a *Flow Verification System* which is designed to stop the pump and provide a contact closure output in the event the sensor does not detect flow during pump operation. This could indicate a clogged injection fitting, empty chemical solution tank, loose tubing connection, etc.

To allow the pump to clear any gasses that may have accumulated during stopper operation (such as with chlorine), an alarm delay time value from 1-255 seconds must be programmed (An alarm delay value of 000 seconds disables the FVS system).

**Install the FVS Flow Sensor** - The Flow Verification Sensor (FVS) should be installed on the outlet (discharge) side of the pump head valve.

Connect the red/white, black, and white wires from the sensor to the red, black, and yellow wires located in the pump's junction box.

**Contact Closure Alarm Output** - A contact closure output (relay) is provided with the FVS system. The relay can be configured for normally open (factory default) or normally closed operation by properly positioning the connector plug on the circuit board .



### Recommended FVS Models

Model No.	Adapt.	C3 Model	FVS Working Range
FV-501-1V	Female	C3x1 (62 RPM)	10 to 100% of pump speed
FV-501-2V	Male		
FV-601-1V	Female	C3x2 (130 RPM)	10 to 100% of pump speed
FV-601-2V	Male		

Note: Not recommended for use below 10% output speed  
 "x" represents any C3 model combination



## 6.0 C3F External Input / Output Signal Connection





### SIGNAL INPUT/OUTPUT WIRE COLOR CODES

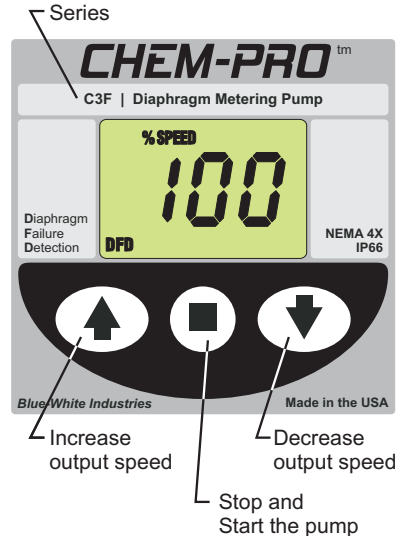
INPUT TYPE	WIRE COLOR CODE
ALARM RELAY connect 2-conductor plug to either normally open (NO) (factory default) or normally closed (NC) side of receptacle. 3 AMP MAX @ 125VAC (24VDC)	PURPLE & PURPLE
FLOW VERIFICATION SENSOR (FVS)	RED/WHITE (+ 20VDC) BLACK (-) YELLOW (signal)

## 6.1 How To Operate The C3F




### C3F Series Operation

The C3F is a powerful yet simple to operate metering pump.

-  To **start the pump**, press the Start / Stop button
-  To **increase the output**, press the Up button
-  To **decrease the output**, press the Down button
-  To **stop the pump**, press the Start / Stop button



### Priming the C3F

-  +  To **prime the pump**, press the Up button and the Start / Stop button at the same time. The pump will run in prime mode for 60 seconds at 100% output.
-  To **stop priming** before the 60 seconds, press the Start / Stop button.



## 7.0 C3V External Input/Output Signal Connection

C3V will accept a variety of external control input signals: 4-20mA, 0-10VDC, TTL, CMOS, AC Sine waves, contact closures, Hall Effect, NPN. The 4-20mA and 0-10 VDC loops must be powered. Two types of frequency inputs, AC sine waves (magnetic coils type outputs) and Digital Square waves (Hall Effect signals, contact closures), are acceptable.

All wiring connections are to be made inside of the junction box located on the side of the C3V. liquid-tite connectors are supplied and should be used for the external signal cables. The signal input wires are color coded to the type of signal being used.

### SIGNAL INPUT/OUTPUT WIRE COLOR CODES


INPUT TYPE	WIRE COLOR CODE
4-20 mA	BLUE (+) (non-powered) & BLACK (-)
0-10 VDC	ORANGE (+) (non-powered) & BLACK (-)
AC sine wave, TTL, CMOS	WHITE (+) & BLACK (-)
CONTACT (10v @ 2 mA max) HALL EFFECT, NPN	RED (+) & WHITE (-)
ALARM RELAY connect 2-conductor plug to either normally open (NO) (factory default) or normally closed (NC) side of receptacle. 3 AMP MAX @ 125VAC (24VDC)	PURPLE & PURPLE
FLOW VERIFICATION SENSOR (FVS)	RED/WHITE (+ 20VDC) BLACK (-) YELLOW (signal)
MOTOR ON SIGNAL 5-20V DC open collector output closed while motor is energized	BROWN (+) & BLACK (-)


### PADDLEWHEEL SENSOR SIGNAL INPUT WIRING


BLUE-WHITE PADDLEWHEEL SENSOR TYPE	PADDLEWHEEL SENSOR WIRE COLOR CODE	PUMP INPUT WIRE COLOR CODE
MODEL FH HALL EFFECT SENSOR	RED (+) BLACK (-) BARE (signal)	RED (+ 20VDC) BLACK (-) WHITE (signal)
MODEL FC AC SINE WAVE SENSOR	RED (+) BLACK (-)	WHITE (+) BLACK (-)


## 7.1 How To Operate The C3V

### C3V Series Operation


 **MODE** button is used to select the mode you would like to run the pump in. See below for more **MODE** information.

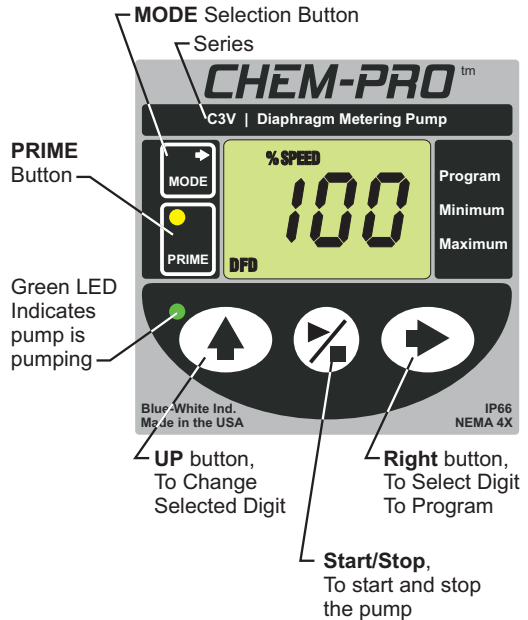
 **PRIME** button is used to prime the pump. The pump will run at full speed for 60 seconds.

 To stop the priming function before the 60 seconds, press the **Start/Stop** button.

 **UP** button is used to change the selected digit.

**Start/Stop** button is used to Start and Stop the pump.

 **RIGHT** button is used to select the digit to program.



## C3V Modes

- MODE 0** = DFD (Diaphragm Failure Detection) On/Off  
FVS (Flow Verification System) 0 = OFF, 1-255 Seconds = ON  
**Please Note:** You will not see the FVS icon or be able to configure the FVS unless an FVS sensor is wired to the C3 pump.
- MODE 1** = Manual Adjustment, 1 - 100% (external input disabled)
- MODE 2** = 4-20 mA input
- MODE 3** = 0-10 VDC input
- MODE 4** = Frequency input (Hz), also known as pulse input  
Frequency (Hz) mode is commonly used in proportional feed systems. Pump can be wired to a paddlewheel flowmeter, ultrasonic flowmeter, or any type of high frequency flowmeter. Pump will smoothly speed up and slow down based on frequency signals. Range = 1 - 1000 Hz
- MODE 5** = Batch  
Batch mode can be used with water meters, contact closure switch, and other single pulse or low pulse equipment. In Batch mode, the pumps' 'motor speed' and 'on time' is configured to be initiated by a single pulse or multiple pulses (up to 1,000 pulses). In MODE 5 the pump 'motor speed' is fixed (1 - 100%) for a specified amount of 'on time' (0.1 - 199.9 seconds or 0.1 - 199.9 minutes).

**Tip! To View current Input value  
From an external source**



Press and hold the **UP** button to toggle from current pump speed output to current Input value.

## 7.2 OPERATING MODE 1 - Output adjusted manually

In this mode, the pump's motor speed is adjusted manually using the front panel touch pad. The motor speed can be adjusted from 0-100%.

### ❖ Set the pump for mode 1.



Press the **MODE** button until **MODE 1** is shown on the LCD display.

The **%SPEED** icon will light.

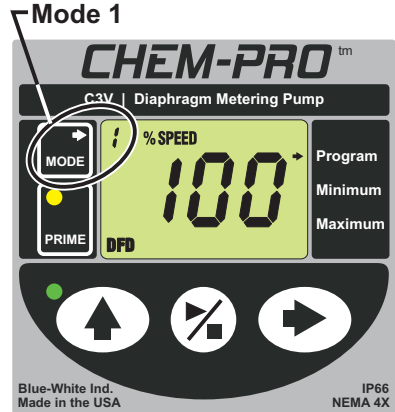
The large **LCD** will indicate the currently programmed percentage of speed.

### ❖ Enter the programming mode.



Press and **MODE** button for more than two seconds.

A blinking **ARROW** will point to the word **PROGRAM** indicating the program mode has been activated.



Press the **Right** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



To exit the programming mode, press the **MODE** button for more than two seconds.

The arrow next to the word **PROGRAM** will disappear.

- ✓ **NOTE:** If while in the program mode no buttons are pressed within 20 seconds, the circuitry will automatically return to the run mode, without saving changes.

## 7.3 OPERATING MODE 2 - 4-20 mA input Mode

In this mode, the pump's motor speed is adjusted automatically based on the value of the 4-20 mA input signal. Any motor speed can be assigned to either the minimum or maximum milliamp input values.

### ❖ Set the pump for mode 2.



Press the **MODE** button until **MODE 2** is shown on the LCD display.

The **%SPEED** or **mA** icon will light depending on the current display setting.



Press and hold the **UP** button to toggle from current pump speed output to current Input **mA** signal.

The large **LCD** will indicate the current motor speed or the current mA input value.

### ❖ Enter the programming mode.



While **MODE 2** is displayed, press the **MODE** button for more than two seconds.

Blinking **ARROW's** will point to the words **PROGRAM** and **MINIMUM** indicating the program mode is activated and the minimum value is ready to be programmed. The **% SPEED** icon will blink indicating the percentage of speed is ready to be programmed.

### ❖ Enter the motor speed at the minimum mA input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit. Repeat until all digits are programmed.



Press the **MODE** button. The **% SPEED** icon will stop blinking and the **mA** icon will blink indicating the minimum mA value is ready to be programmed. The currently programmed minimum value is shown on the **LCD**.

### ❖ Enter the minimum mA input signal value.

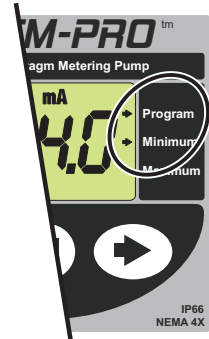
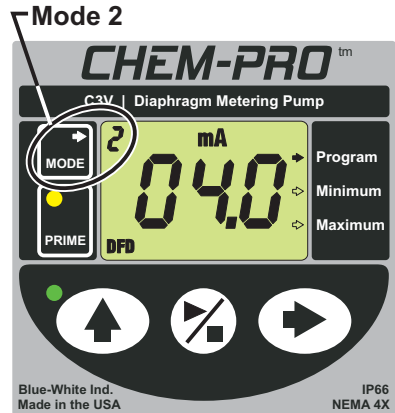
*Note:* this value must be less than the maximum mA input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.



Repeat until all digits are programmed.



Press the **MODE** button. The **mA** icon will stop blinking and the **% SPEED** icon will blink. The **ARROW** next to the word **MAXIMUM** will blink indicating the maximum value is ready to be programmed. The currently programmed maximum motor speed value is shown on the **LCD**.

- ❖ **Enter the motor speed at the maximum mA input signal value.**



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The **% SPEED** icon will stop blinking and the **mA** icon will blink indicating the maximum mA value is ready to be programmed. The currently programmed maximum value is shown on the **LCD**.

- ❖ **Enter the maximum mA input signal value.**

*Note:* this value must be greater than the minimum mA input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

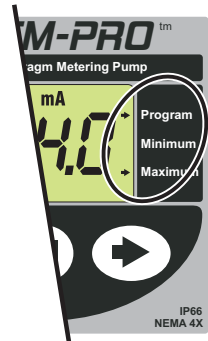
Repeat until all digits are programmed.



Press the mode button. Programming is complete.

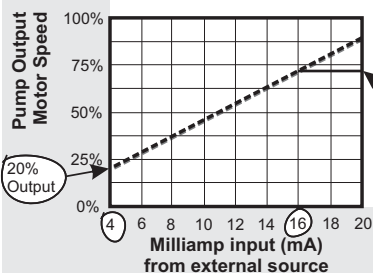


To exit the programming mode, press the **MODE** button for more than two seconds. The **PROGRAM** arrow will disappear.





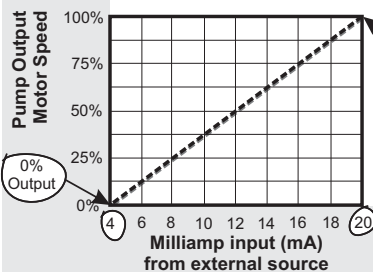
**Mode 2 Programming Examples**



**Example 1**

4 mA will result in a pump output of 20.0%

16 mA will result in a pump output of 70.0%



**Example 2**

4 mA will result in a pump output of 0.0%

20 mA will result in a pump output of 100.0%

**Tip! To View current Input value**



Press and hold the **UP** button to toggle from **current pump speed** output to **current Input value**.

## 7.4 OPERATING MODE 3 - 0-10 VDC Mode

In this mode, the pump's motor speed is adjusted automatically based on the value of the 0-10VDC input signal. Any motor speed can be assigned to either the minimum or maximum DC input signal values.

### ❖ Set the pump for mode 3.



Press the **MODE** button until **MODE 3** is shown on the LCD display.

The % **SPEED** or **VDC** icon will light depending on the current display setting.



Press and hold the **UP** button to toggle from current pump speed output to current **VDC** Input value.

The large **LCD** will indicate the current motor speed or the VDC input value.

### ❖ Enter the programming mode.



While **MODE 3** is displayed, Press and hold the **MODE** button for more than two seconds.

Blinking **ARROW's** will point to the words **PROGRAM** and **MINIMUM** indicating the program mode is activated and the minimum value is ready to be programmed. The % **SPEED** icon will blink indicating the percentage of speed is ready to be programmed.

### ❖ Enter the motor speed at the minimum VDC input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



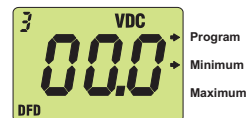
Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



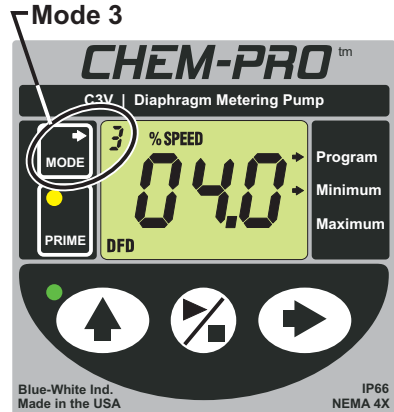
Repeat until all digits are programmed.

- ❖ Press the **MODE** button. The % **SPEED** icon will stop blinking and the **VDC** icon will blink indicating the minimum VDC value is ready to be programmed. The currently programmed minimum value is shown on the **LCD**.



### Enter the minimum VDC input signal value.

Note: this value must be less than the maximum VDC input signal value.





Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit. Repeat until all digits are programmed.

- ✘ Press the **MODE** button. The **VDC** icon will stop blinking and the **% SPEED** icon will blink. The **ARROW** next to the word **MAXIMUM** will blink indicating the maximum value is ready to be programmed. The currently programmed maximum motor speed value is shown on the **LCD**.



- ✘ Enter the motor speed at the maximum VDC digit.
- ✘ input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The **% SPEED** icon will stop blinking and the **VDC** icon will blink indicating the maximum VDC value is ready to be programmed. The currently programmed maximum value is shown on the **LCD**.

- ✘ Enter the maximum VDC input signal value.  
Note: this value must be greater than the minimum VDC input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.

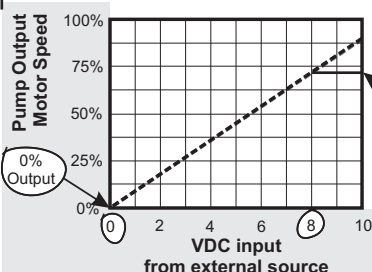


Press the **MODE** button. Programming is complete.



To exit the programming mode, press and hold the **MODE** button for more than two seconds. The **PROGRAM** arrow will disappear..

## Mode 3 Programming Examples

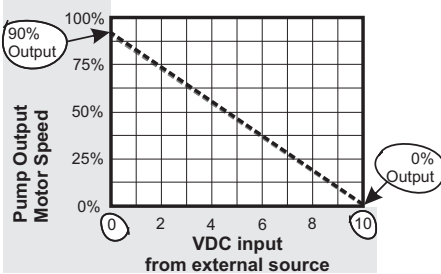


### Example 1

0 VDC will result in a pump output of 0.0%

8 VDC will result in a pump output of 70.0%

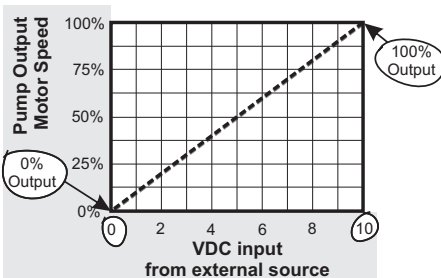
**Continued - Mode 3 Programming Examples**



**Example 2**

0 VDC will result in a pump output of 90%

10 VDC will result in a pump output of 0.0%



**Example 3**

0 VDC will result in a pump output of 0.0%

10 VDC will result in a pump output of 100.0%

**Tip! To View current Input value**



Press and hold the **UP** button to toggle from current pump speed output to current Input value.

**7.5 OPERATING MODE 4 - Frequency (Hz) Mode**

Also known as Pulse Input. In this mode, the pump's motor speed is adjusted automatically based on the frequency (Hz) of the input signal. Any motor speed can be assigned to either the minimum or maximum Hz input signals.

❖ **Set the pump for mode 4.**



Press the **MODE** button until **MODE 4** is shown on the LCD display.

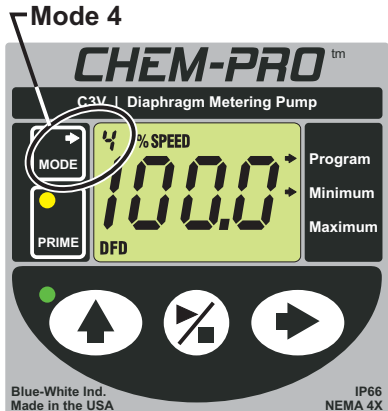
The **% SPEED** or **Hz** icon will light depending on the current display setting.



Press and hold the **UP** button to toggle from current pump speed output to current **Hz** Input value.

The large **LCD** will indicate the current motor speed or the **Hz** input value.

❖ **Enter the programming mode.**





While **MODE 4** is displayed, press and hold the **MODE** button for more than two seconds.

Blinking **ARROW's** will point to the word **PROGRAM** and **MINIMUM** indicating the program mode is activated and the minimum value is ready to be programmed. The **% SPEED** icon will blink indicating the percentage of speed is ready to be programmed.

✱ **Enter the motor speed at the minimum Hz input signal value.**



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The **% SPEED** icon will stop blinking and the **Hz** icon will blink indicating the minimum Hz value is ready to be programmed. The currently programmed minimum value is shown on the **LCD**.



✱ **Enter the minimum Hz input signal value (to the nearest 10 Hz).**

Note: this value must be less than the maximum Hz input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The **Hz** icon will stop blinking and the **% SPEED** icon will blink. The **ARROW** next to the word **MAXIMUM** will blink indicating the maximum value is ready to be programmed. The Currently programmed maximum motor speed value is shown on the **LCD**.



✱ **Enter the motor speed at the maximum VDC input signal value.**



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The **% SPEED** icon will stop blinking and the **Hz** icon will blink indicating the maximum Hz value is ready to be programmed. The currently programmed maximum value is shown on the **LCD**.

**Enter the maximum Hz input signal value (to the nearest 10 Hz).**

Note: this value must be greater than the minimum Hz input signal value.



Press the **RIGHT** button to select the digit to program. The digit will blink when selected.



Press the **UP** button to change the selected digit.

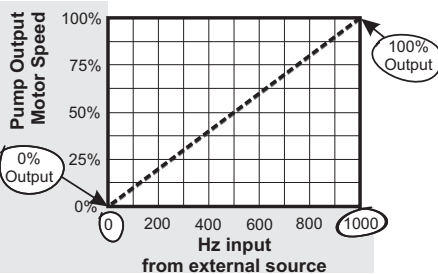


Repeat until all digits are programmed.  
Press the **MODE** button. Programming is complete.



To exit the programming mode, press and hold the **MODE** button for more than two seconds. The **PROGRAM** arrow will disappear.

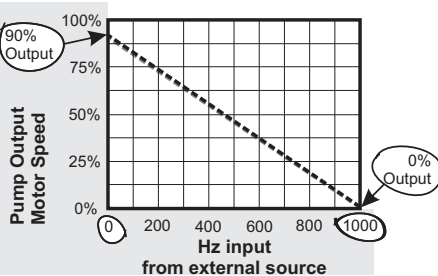
**Mode 4 Programming Examples**



**Example 1**

0 Hz will result in a pump output of 0.0%

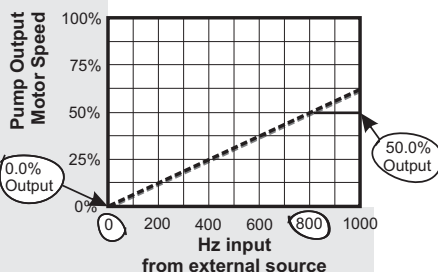
1000 Hz will result in a pump output of 100.0%



**Example 3**

0 Hz will result in a pump output of 90.0%

1000 Hz will result in a pump output of 0.0%



**Example 3**

0 VDC will result in a pump output of 0.0%

800 Hz will result in a pump output of 50.0%

**Tip! To View current Input value**



Press and hold the **UP** button to toggle from current pump speed output to current Input value.

## 7.6 OPERATING MODE 5 - Batch Mode -

In this mode, the pump's 'motor speed' and 'on time' is configured to be initiated by a single pulse or up to 1,999 pulses.

You will configure the pump in the following order:

- a. Select the % **SPEED**.  
(1% to 100%)
- b. Select the pump **ON** time.  
(0.1 to 199.9 and select units: seconds (**SEC**) or minutes (**MIN**))
- c. Select the amount of pulses to receive to trigger the pump.  
(1 pulse up to 1999 pulses)

### ❖ Set the pump for mode 5.



Press the **MODE** button until **MODE 5** is shown on the LCD display.

The % **SPEED** and **Hz** icon will light.

The large **LCD** will indicate the current motor speed or the Hz input value.

### ❖ Enter the programming mode.



While **MODE 5** is displayed, press and hold the **MODE** button for more than two seconds.

Blinking **ARROW's** will point to the word **PROGRAM** and **MINIMUM**

A blinking **ARROW** will point to the word **PROGRAM** and the % **SPEED** icon will blink indicating the program mode is activated and the % **SPEED** value is ready to be programmed.

### ❖ Enter the motor speed. (1% to 100%)



Press the **RIGHT** button to select the digit to program. The digit will blink when selected. (Moves to the next digit to the right.)



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.



Press the **MODE** button. The % **SPEED** icon will stop blinking and the **SEC** or **MIN** icon will blink indicating the pump **ON-time** value is ready to be programmed.

### ❖ Enter the pump ON-time. (0.1 to 199.9 seconds or minutes)

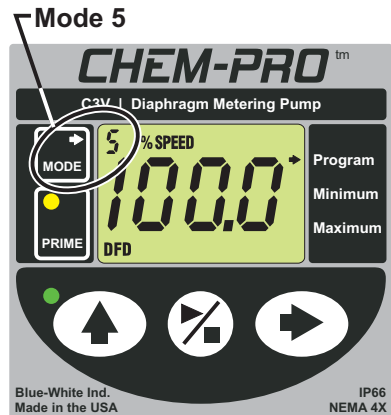


Press the **RIGHT** button to select the digit to program. The digit will blink when selected. (Moves to the next digit to the right.)



Press the **UP** button to change the selected digit.

Repeat until all digits are programmed.





Once all the digits are programmed, press the **RIGHT** arrow to then select between SEC (seconds) and MIN (minutes).



Use the **UP** arrow to scroll through SEC and MIN.



Press the **MODE** button. The **SEC** or **MIN** icon will stop blinking and the **Hz** icon will blink indicating the number of pulses is ready to be programmed.

❖ **Enter the number of pulses to trigger the batch.** (1 to 1999 pulses)



Press the **RIGHT** button to select the digit to program. The digit will blink when selected. (Moves to the next digit to the right.)



Press the **UP** button to change the selected digit. Repeat until all digits are programmed.



Press the **MODE** button. Programming is complete.



To exit the programming mode, press and hold the **MODE** button for more than two seconds. The **PROGRAM** arrow will disappear.

### Tip! To View current Input value



Press and hold the **UP** button to toggle from current pump speed output to current Input value.

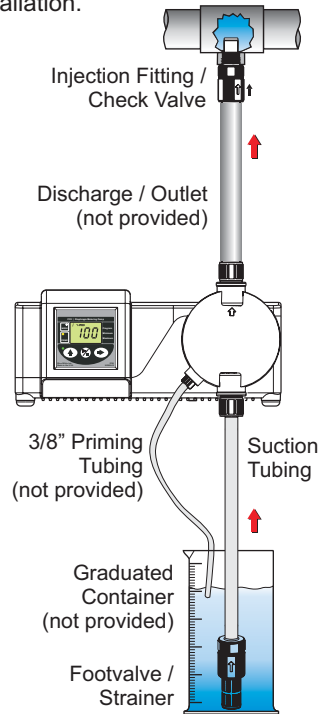
**CAUTION:** Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on the solution being pumped. Refer to MSDS precautions from your solution supplier.



## 8.0 Measuring the Pump's Output - Volumetric Test.

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

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



### Example:

During your 1 minute calibration period, say the 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 the pump into specialized systems. The pump should be **serviced by qualified persons only**.

## 9.0 How to Maintain the Pump

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

### 9.1 Routine Inspection and Maintenance

The pump requires very little maintenance. However, the pump and all accessories should be checked regularly. 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 and the like during the first week of operation are signs of severe chemical attack. If this occurs, immediately remove the chemical from the pump. Determine which parts are being attacked and replace them with parts that have been manufactured using more suitable materials. The manufacturer does not assume responsibility for damage to the pump that has been caused by chemical attack.

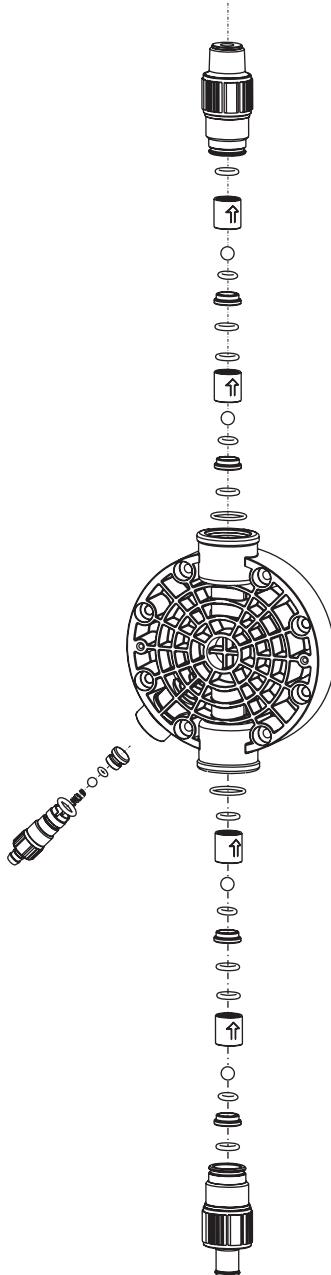
**Brush Kit Life Cycle over 3,000 hours of continuous use.**(Part number 72000-378)

### 9.2 How to Clean the Pump

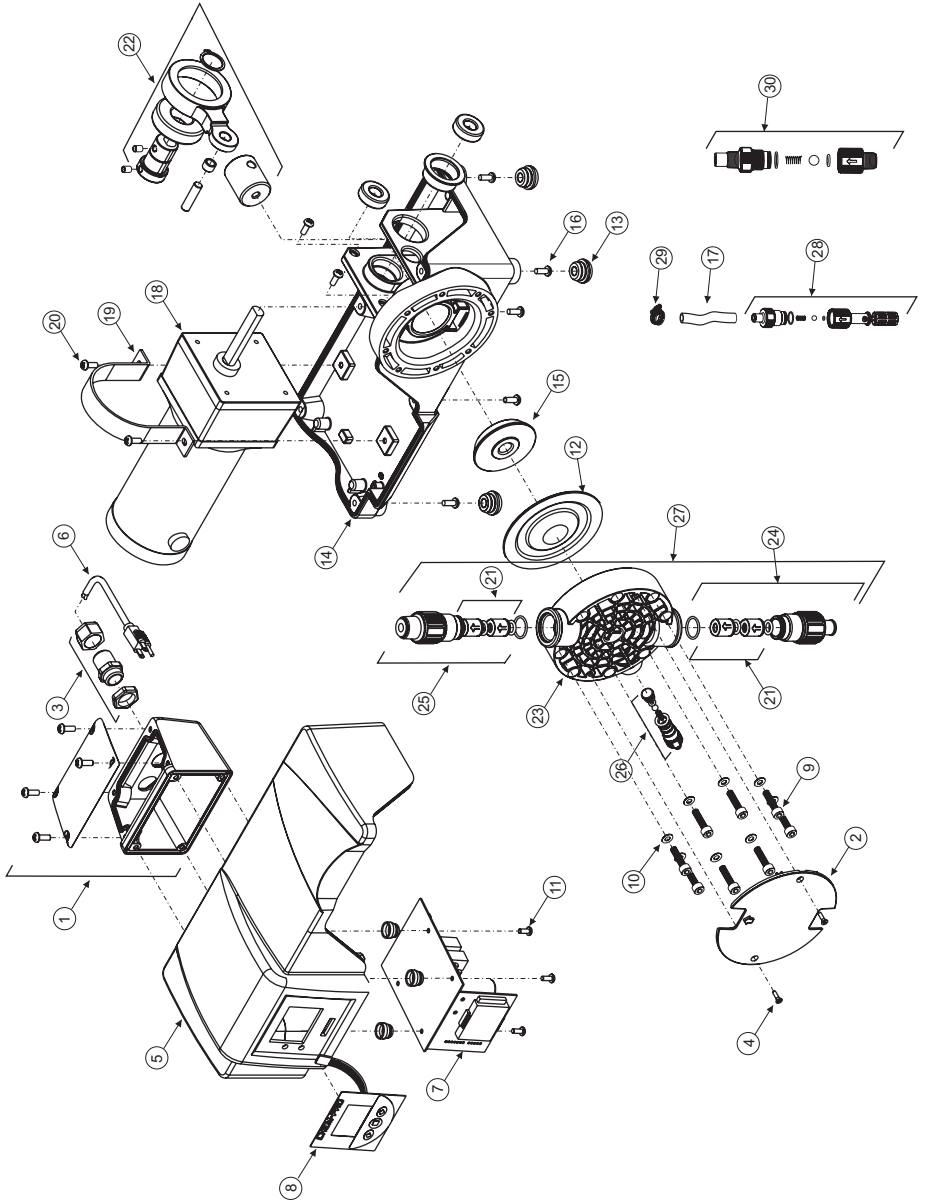
The pump will require occasional cleaning, especially the Injection fitting, the Footvalve / Strainer, and the pump head valves. The frequency will depend on the type and severity of service.

- ☒ Inspect and replace the pumphead valves as required.
- ☒ When changing the diaphragm, the pump head chamber and pump head cover should be wiped free of any dirt and debris.
- ☒ Periodically clean the injection / check valve assembly, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog the fitting, increase the back pressure and interfere with the check valve operation.
- ☒ Periodically clean the suction strainer.
- ☒ Periodically inspect the air vents located under the motor housing and in the back on the rear housing cover. Clean if necessary.

# PUMP HEAD AND VALVE EXPLODED VIEW



# Replacement Parts Drawing





## PARTS LIST

Item	Part No.	Description	Qty.
1.	71000-583	J-Box w/ Cover	1
2.	90001-157	P-Head Cover "CHEM PRO" logo	1
	90001-158	P-Head Cover no logo	1
3.	90008-035	Liquid Tight Connector (large)	1
	90008-199	Liquid Tight Connector (small)	1
4.	90011-081	Screw P-Head Cover SS	2
5.	71000-584	Cover housing model C3F (Std.)	1
	71000-585	Cover housing model C3V (Deluxe)	1
6.	71000-175	Power Cord,115v	1
	71000-176	Power Cord,220v	1
	71000-177	Power Cord,230v	1
7.	72000-382	Controller Kit model C3F (Std.) 115V	1
	72000-383	Controller Kit model C3F (Std.) 230V	1
	72000-384	Controller Kit model C3V (deluxe) 115V	1
	72000-385	Controller Kit model C3V (deluxe) 230V	1
8.	90012-287	Label Overlay model C3F (std) "Chem-Pro"	1
	90012-289	Label Overlay model C3V (deluxe) "Chem-Pro"	1
9.	90011-181	Screw P-Head SS # 10-32 x 1.25L	8
10.	90011-049	Washer SS #10 screw	4
11.	90011-180	Screw Nylon #8-32	4
12.	90003-560	Diaphragm C3 TFE/Hypalon	1
13.	90003-561	Bumper Feet	4
14.	71000-588	Frame Housing Assy.	1
	- Includes	TFD Sensor	
		Bearings	
		Bumper Feet	
15.	76001-347	Backup Washer Diaphragm	1
16.	90011-115	Screw for housing 10-32x.50L SS	10
17.	76000-361	Tubing Suction C3 .75" OD x .50" ID x 8ft	1
18.	70002-276	Motor 130RPM	1
	70002-277	Motor 62RPM	1
19.	90008-367	Clamp Heat Sink	1
20.	90011-182	Screw #10-32 x .31 SS	2
21.	20000-194	Kit 4 cartridge insert C3 Viton	4
	20000-195	Kit 4 cartridge insert C3 EP	4
22.	71000-573	Cam .06" C3 S/A complete	1
	71000-574	Cam .10" C3 S/A complete	1
23.	90002-258	Pump Head C3 molded PVDF	1
24.	70001-347	Cart. Valve Assy. .50T Viton	1
	70001-348	Cart. Valve Assy. .50T EP	1
25.	70001-349	Cart. Valve Assy. .50 Male NPT/Viton	1
	70001-350	Cart. Valve Assy. .50 Male NPT/EP	1
	70001-351	Cart. Valve Assy. .50 Female NPT Viton	1
	70001-352	Cart. Valve Assy. .50 Female NPT EP	1
26.	70001-353	Primer Valve Assy. Viton	1
	70001-354	Primer Valve Assy. EP	1
27.	70001-356	Kit Head Complete C3 .50T & .50M/NPT Viton	1
	70001-357	Kit Head Complete C3 .50T & .50M/NPT EP	1
	70001-358	Kit Head Complete C3 .50T & .50F/NPT Viton	1
	70001-359	Kit Head Complete C3 .50T & .50F/NPT EP	1
28.	71000-575	Foot Valve Assy. Viton	1
	71000-576	Foot Valve Assy. EP	1
29.	90008-043	Clamp #5 SS	1
30.	71000-579	Injection Valve Assy. Viton	1
	71000-580	Injection Valve Assy. EP	1