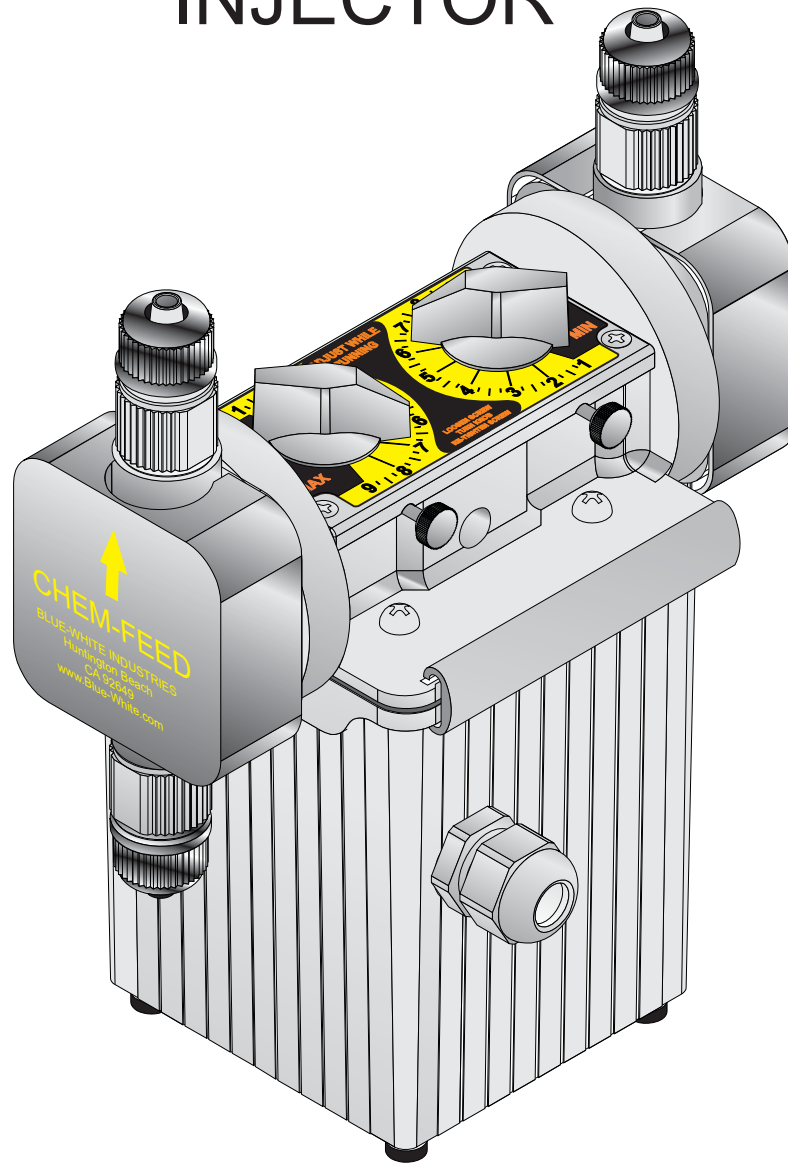


# CHEM-FEED<sup>®</sup>

## INJECTOR



MODEL C-1700N  
Positive Displacement Injector Pump  
Operating Manual

**Blue-White<sup>®</sup>**  
**Industries, Ltd.**

# C-1700N

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### 1.0 Introduction

Thank you for purchasing the C-1700N positive displacement metering pump. The C-1700N is designed to inject chemicals into piping systems. The pump has been tested by NSF International for use with 12 ½% Sodium Hypochlorite. All models are equipped with two top mounted mechanical flow rate adjustment knobs. Optional on/off cycling timers are available.

### 2.0 Specifications

<b>Maximum Working Pressure</b>	125 psig / 8.6 bar*
<b>Maximum Fluid Temperature</b>	130° F / 54° C
<b>Output Accuracy</b>	+/- 10% of maximum (water @ 70° F, 0 psig, and 5' suction lift)
<b>Ambient Temperature Range</b>	14 to 110° F / -10 to 43° C
<b>Enclosure</b>	NEMA 3R (acceptable for outdoor use)
<b>Duty Cycle</b>	Continuous
<b>Maximum Viscosity</b>	1,000 Centipoise
<b>Maximum Suction Lift</b>	up to 10 ft. water
<b>Power Requirements</b>	115V60Hz 45 Watts 220V50Hz 45 Watts 230V60Hz 45 Watts 24V60Hz 45 Watts
<b>Dimensions</b>	9-1/16" high x 4-1/2" wide x 7-5/32" deep
<b>Weight</b>	7.5 lb.

### 3.0 C-1700N Features

- Double-ball ceramic check valves.
- PVDF (Kynar) valve assemblies.
- Viton o-rings.
- High outlet pressure capability of 125 PSIG.\*
- Easy access, top mounted mechanical feed rate adjustment.
- Ball bearing supported motor drive shaft.
- Permanently lubricated ball bearing motor.
- 20:1 adjustment turn down ratio.
- Acceptable for outdoor use. (NEMA 3R; IP23)
- Corrosion resistant Valox housing.
- Easy servicing.
- Includes suction tube foot valve & strainer, suction tube weight, suction tubing, discharge tubing and injection fitting with internal back-flow check valve and mounting hardware.

\* Most models.

### 4.0 How To Install the C-1700N



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

*Note: All diagrams are strictly for guideline purposes only. Always consult an expert before installing the C-1700N into specialized systems.*

*The C-1700N should be **serviced by qualified persons only.***

#### 4.1 Mounting Location

Choose an area located near the chemical supply tank, chemical injection point and electrical supply. Although the pump is designed to withstand outdoor conditions, a cool, dry, well ventilated location is recommended. Install the pump where it can be easily serviced.

- Mount the pump to a secure surface or wall using the enclosed hardware. Wall mount to a solid surface only. Mounting to drywall with anchors is not recommended.
- Keep the outlet (discharge) tubing as short as possible. Longer tubing increases the back pressure at the pump tube.
- Do not mount the pump directly over your chemical container. Chemical fumes may damage the unit. Mount the pump off to the side or at a lower level than the chemical container.
- Mounting the pump lower than the chemical container will gravity feed the chemical into the pump. This “flooded suction” installation can reduce the time required to prime the pump. Install a shut-off valve, pinch clamp or other means to halt the gravity feed to the pump during servicing.
- Your solution tank should be sturdy. Keep the tank covered to reduce fumes.
- Be sure your installation does not constitute a cross connection with the drinking water supply. Check your local plumbing codes.

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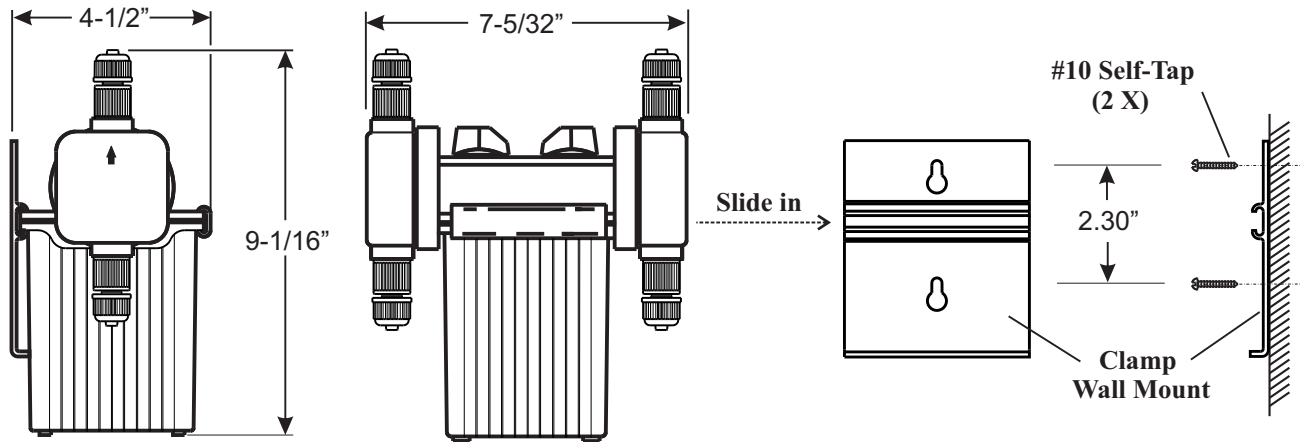


FIG. 4.0 DIMENSIONAL DRAWING

FIG. 4.1 INJECTOR WALL MOUNTING

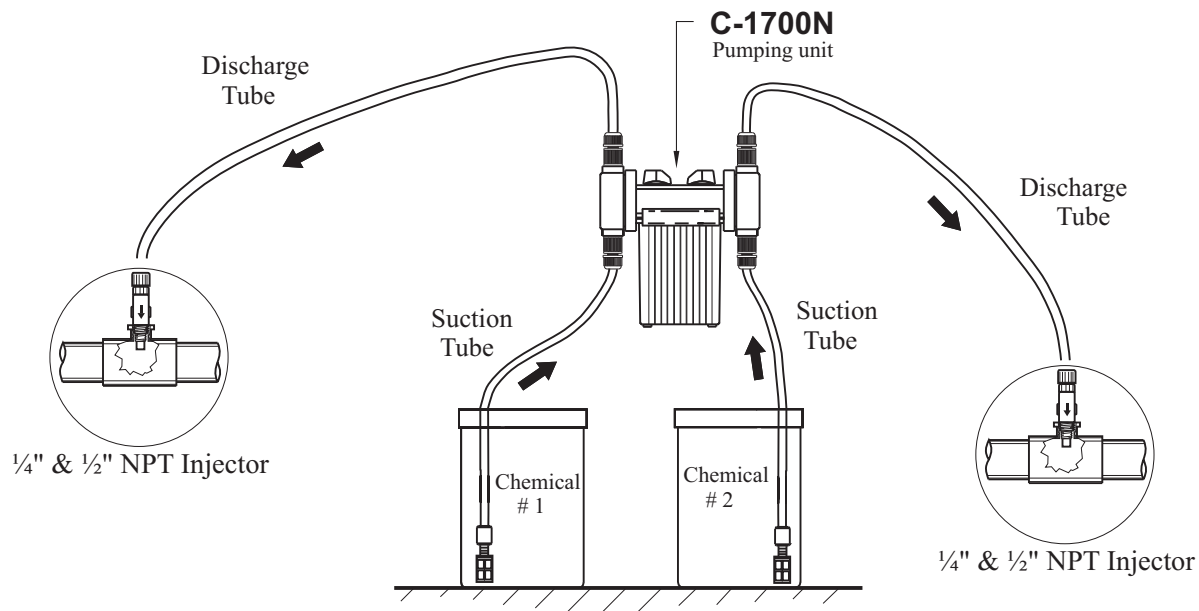


FIG. 4.2 TYPICAL INSTALLATION



**CAUTION**

To prevent chemical overdosing, a flow switch is recommended on the circulation system to automatically stop chemical feed when there is no return flow to the swimming pool or spa.



**WARNING**

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

## 4.2 Electrical Connections

### 4.2.1 Input Power Connections



**Risk of electric shock. Be certain to connect the pump to the proper supply voltage. Using the incorrect voltage will damage the pump and may result in injury. The voltage requirement is printed on the pump serial label.**



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

The C-1700N is supplied with either a ground wire conductor and a grounding type attachment plug (power cord) or a junction box for field wiring.

**POWER CORD MODELS** -To reduce the risk of electric shock, be certain that the power cord is connected only to a properly grounded, grounding type receptacle.

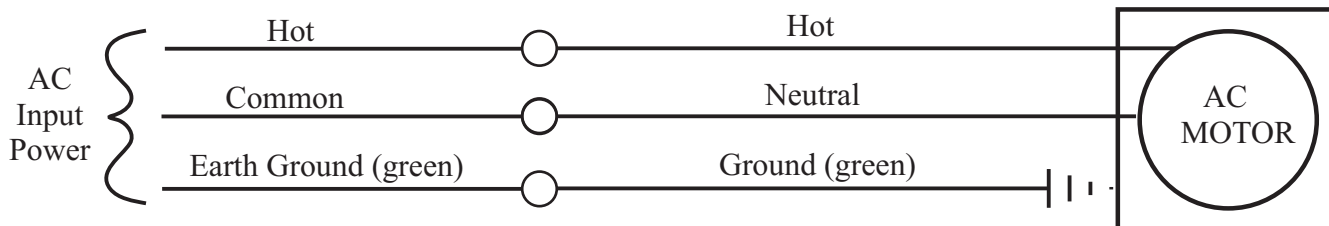
**JUNCTION BOX MODELS** -To reduce the risk of electric shock, be certain that a grounding conductor is connected to the green grounding conductor located in the junction box.

### MOTOR LEADWIRES

INPUT VOLTAGE	HOT LEADWIRE	NEUTRAL LEADWIRE	GROUND LEADWIRE
115V 60Hz	BLACK or YELLOW *	BLUE	GREEN
220V 50Hz	BLUE or YELLOW *	BROWN	GREEN
230V 60Hz	BLACK or YELLOW *	RED	GREEN
24V 60Hz	BLUE *	WHITE	GREEN

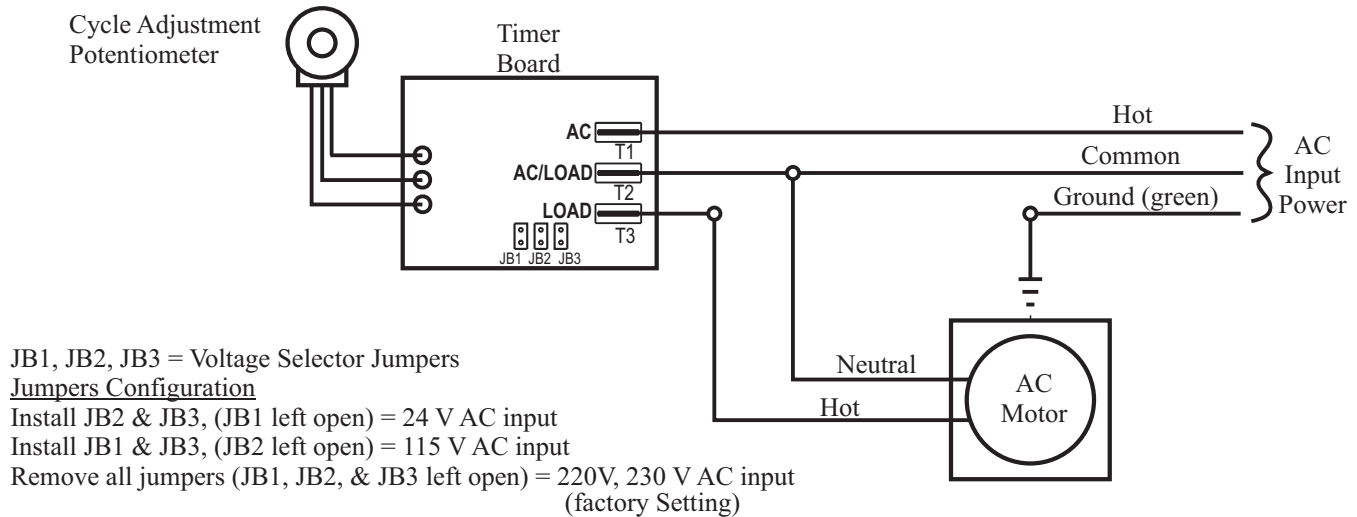
\* Yellow leadwire : thermally protected motor  
 Black or Blue leadwire: standard impedance protected motor

**FIG. 4.4 WIRING DIAGRAM - STANDARD MODELS**



**To prevent chemical overdosing, disconnecting power to the circulation system must also disconnect power to the pump.**

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**FIG. 4.5 WIRING DIAGRAM - FIXED TIMERS**

## 4.3 How To Install the Tubing and Fittings



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

- 4.3.1 Inlet Tubing** - Locate the inlet fitting of the pump head, see fig 4.6. Remove the tube nut. Push the clear PVC suction tubing onto the compression barb of the fitting. Use the tube nut to secure the tube. Hand tighten only.
- 4.3.2 Footvalve/Strainer** - Trim the inlet end of the suction tubing so that the strainer will rest vertically approximately one inch from the bottom of the solution tank. This will prevent sediment from clogging the strainer. Slip the ceramic weight over the end of the suction tube. Press the footvalve/strainer into the end of the tube. Secure the ceramic weight to the strainer. Drop the strainer into the solution tank. Be sure the footvalve does not lay horizontally on the bottom of the solution tank.
- 4.3.3 Outlet Tubing** - Locate the outlet fitting of the pump head, see fig 4.6. Remove the tube nut. Push the opaque outlet (discharge) tubing onto the compression barb of the fitting. Use the tube nut to secure the tube. Hand tighten only.

Trim the other end of the outlet tube leaving only enough slack to connect it to the Injection/Check valve Fitting (see below). Increasing the length of the outlet tube increases the back pressure at the pump head, particularly when pumping viscous fluids.

**Keep the inlet and outlet tubes as short as possible.**

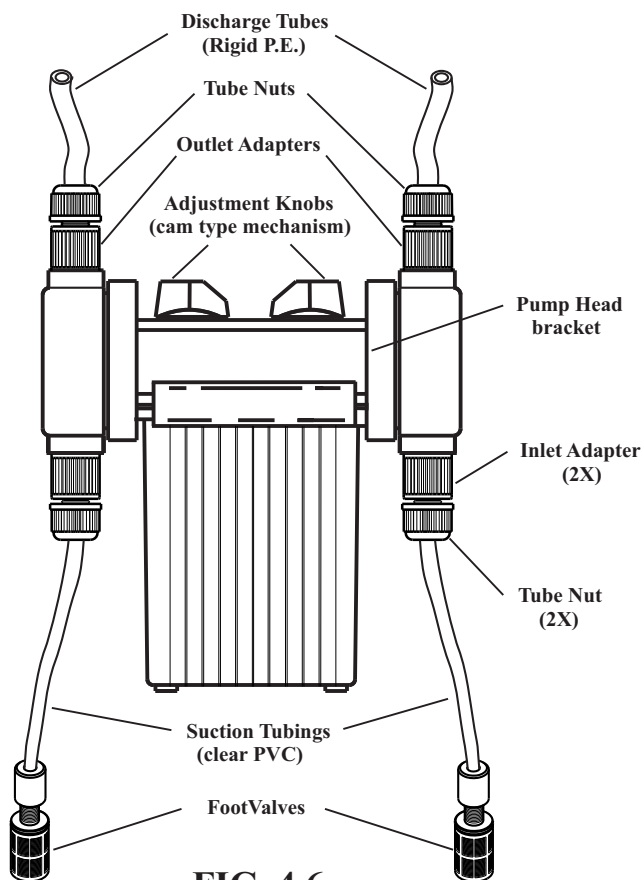


FIG. 4.6

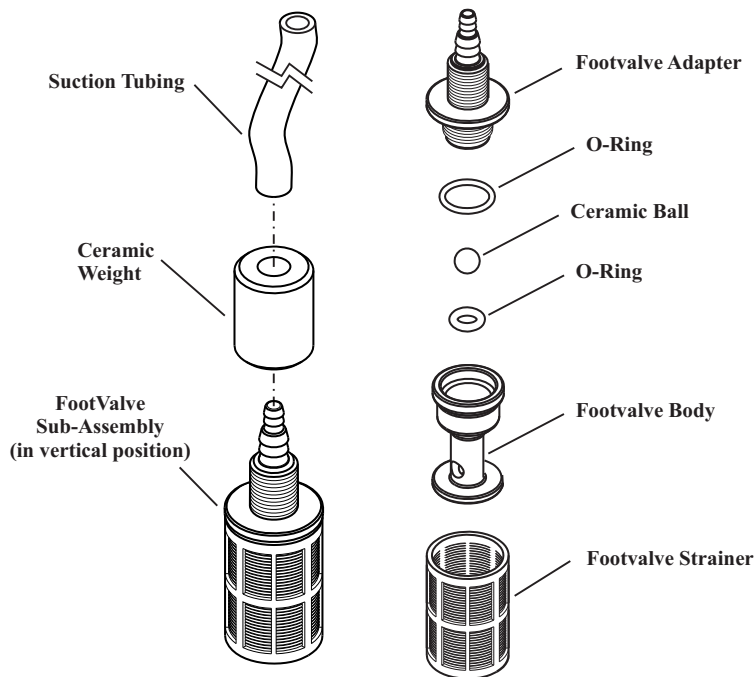


FIG. 4.7 FOOTVALVE ASSY.

**4.3.4 Injection/Check Valve Fitting Installation** - The Injection/Check valve fitting is designed to install directly into either 1/4" or 1/2" female pipe threads.

Install the Injection/Check valve directly into the tee fitting. Do not install the fitting into a pipe stud and then into the tee. The solution must inject directly into the flow stream.

Use Teflon thread sealing tape on the pipe threads. Push the opaque outlet (discharge) tubing onto the compression barb of the Injection/Check valve fitting. Use the tube nut to secure the tube. Hand tighten only.

Injection/Check valve fitting will require periodic cleaning, especially when injecting fluids that calcify such as sodium hypochlorite. These lime deposits and other build ups can clog the fitting increasing the back pressure and interfering with the check valve operation. See section 6.0.

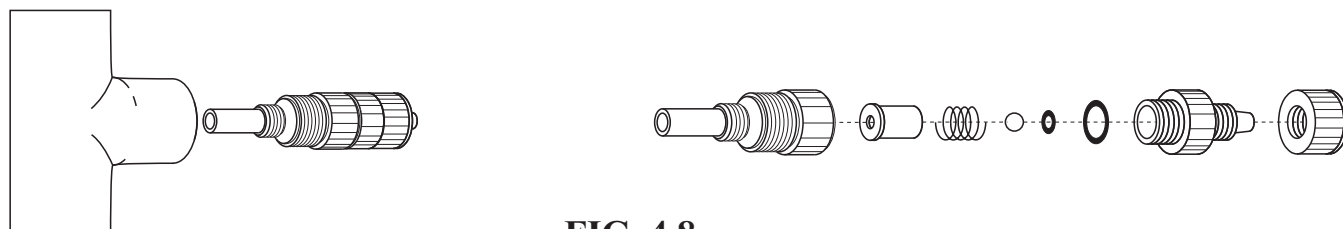


FIG. 4.8  
INJECTION/CHECK VALVE  
TEE INSTALLATION AND EXPLODED VIEW

# C-1700N

## 5.0 How To Operate The C-1700N

**5.1 Adjusting the Pump Output- Standard models (fig. 5.1)** - The C-1700N flow rate(s) can be adjusted within a range of 5% -100% of maximum output (20:1 turndown ratio) by means of two mechanical, cam type mechanisms. The mechanism adjusts the pump's stroke length to an infinite number of settings within the flow range. Because the pump's output is reduced by increasing the pressure of the system being injected into, the amount of suction lift, and the viscosity of the fluid being injected, the pump must be over-sized to allow for these factors. Sizing the pump to allow adjustment within the midrange is preferred to maintain accuracy. Consult the factory for individual pump model output curve data.

To adjust the pump's output:

1. With the pump running, loosen the set screw.
2. Turn the adjustment knob to the desired setting.
3. Re-tighten the set screw.

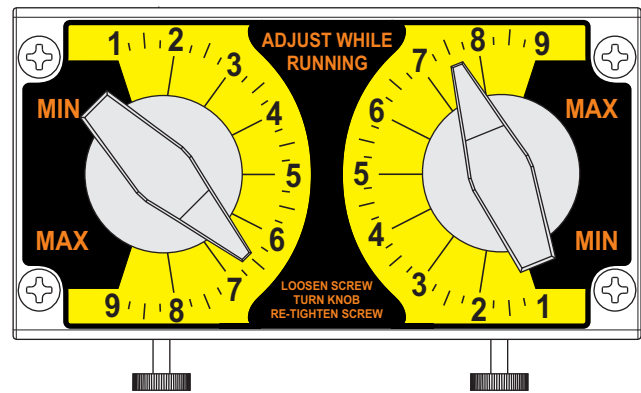


FIG. 5.1

## 5.2 Adjusting the Pump Output - DELUXE Models (fig. 5.2)

In addition to the two cam type mechanism adjustments (section 5.1), the pump output of the C-1700N deluxe unit equipped with an optional electronic cycle timer board can also be fine tuned by adjusting the timer adjustment knob. The total-time cycle is factory preset and is not user adjustable. The on-time cycle is adjustable from 5% to 100% of the total cycle time. Example: If the total-time cycle is 5 seconds and the on-time cycle is adjusted for 20 percent, the pump will run for 1 second and turn off for 4 seconds (5 second total cycle). This cycle is repeated until either the cycle time is changed or the input power is disconnected from the pump.

**Note: When the input power is disconnected from the C-1700N, the unit will maintain the last adjusted settings. When power is restored to the pump, the C-1700N will begin to pump using the last time cycle setting.**

To adjust the On-Time :

Turn the timer adjustment knob located on the junction box cover.

Clockwise increases the time on.

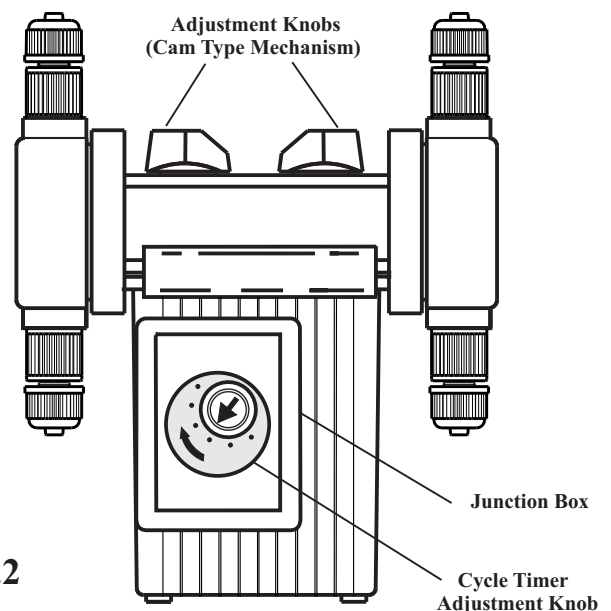


FIG. 5.2



### 5.3 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 Fittings and Footvalves/Strainers are clean and working properly.
2. With the injector installed under normal operating conditions, place the Footvalve/Strainer in a large graduated cylinder.
3. Fill the graduated cylinder with the solution to be injected and run the injector until all air is removed from the suction line and the solution enters the discharge tubing.
4. Refill the graduated cylinder, if necessary, and with the Footvalves completely submerged in the solution, note the amount of solution in the graduated cylinder.
5. Run the injector for a measured amount of time and note the amount of fluid injected. A longer testing time will produce more accurate results.

## 6.0 How to Maintain the C-1700N



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

### 6.1 Routine Inspection and Maintenance

The C-1700N 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.

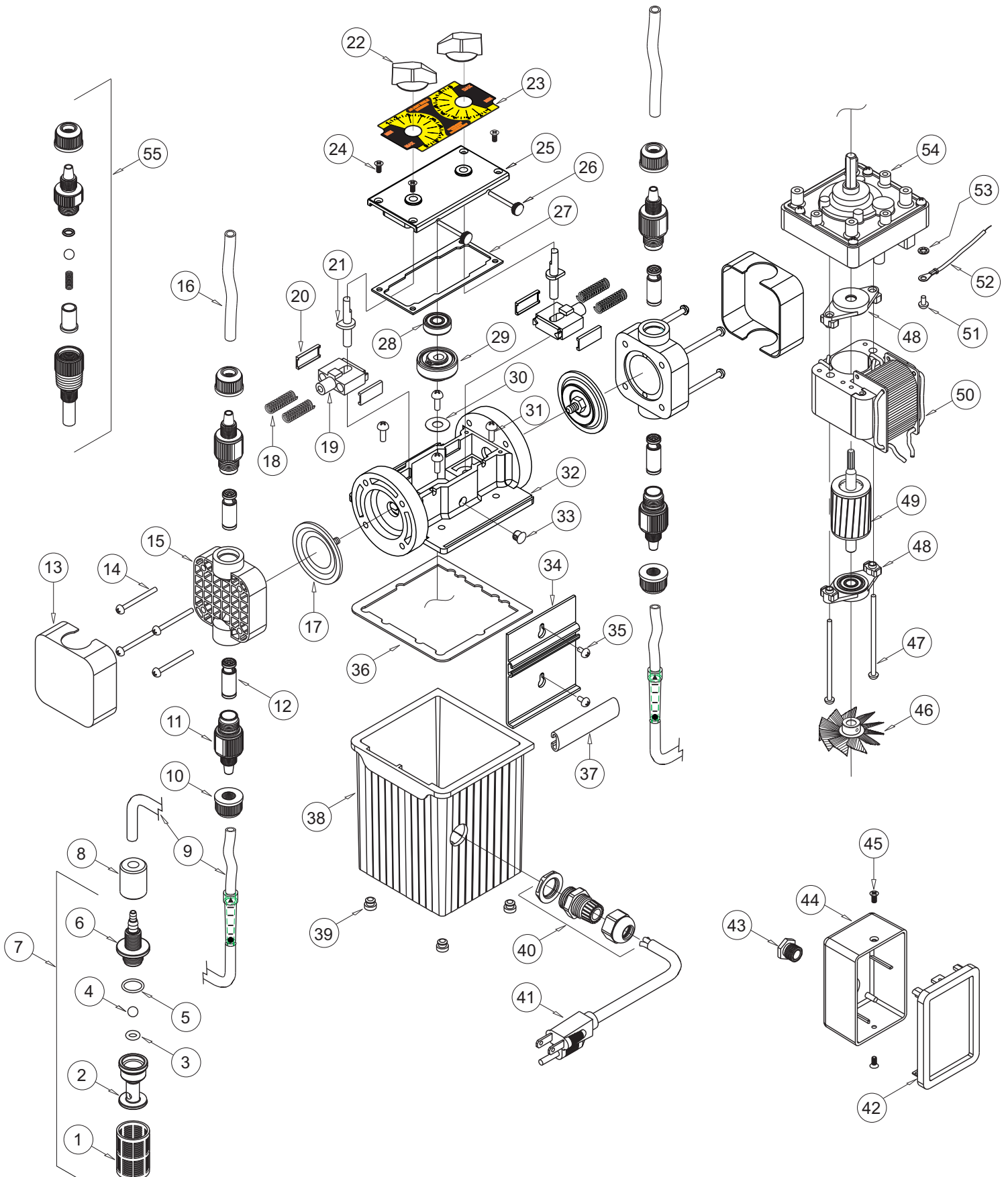
### 6.2 How to Clean the C-1700N

The C-1700N will require occasional cleaning, especially the Injection fittings, the Footvalves/Strainers, and the pump head valves. The frequency will depend on the type and severity of service..

- ☑ 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. See section 4.3.4. Fig. 4.8.
- ☑ Periodically clean the suction strainers. Fig.4.7
- ☑ Periodically inspect the air vents located under the motor compartment and under the pump head. Clean if necessary.

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## Replacement Parts Drawing



C-1700N PARTS LIST

Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	90002-086	Screen, FootValve, P.P.	2	29	70000-131	Drive Cam S/A #1 .125"	1
2	90002-214	Body, FootValve, PVDF	2		70000-133	Drive Cam S/A #2 .055"	1
3	90003-126	O-ring Seat, FootValve, Viton	2		70000-132	Drive Cam S/A #3 .187"	1
4	90003-129	O-ring Seat, FootValve, E.P.	2		70000-722	Drive Cam S/A #4 .100"	1
5	90008-062	Ball, FootValve, Ceramic	2	30	90011-014	Spacer, Rotor	1
6	90003-014	O-ring, FootValve, Viton	2	31	90011-122	Screw 10-32 x .50 PHL PAN	4
7	90003-015	O-ring, FootValve, E.P.	2	32	76000-937	Motor Mount, Large Diaphragm	1
8	90002-215	Adapter, FootValve, PVDF	2	33	90008-138	Plug .312 Hole Black	1
9	71000-324	FootValve S/A, C-340E, EP	2	34	90002-106	Clamp C-17N Wall Mount	1
10	71000-325	FootValve S/A, C-340V, VT	2	35	90011-122	Screw 10-32 x .50 PHL PAN	2
11	90008-068	Ceramic weight, C-346	2	36	90006-597	Gasket, Motor Mount	1
12	70000-638	Tube Indicator Glass 3/8 x 5FT	2	37	76000-630	Slide Clamp	2
13	76000-171	Tube Suction 1/4 x 5FT	2	38	76000-939	Motor Cover C-17N 115V	1
14	90002-077	Tube Nut, .37T, P.P.	4		76000-940	Motor Cover C-17N 220/230V	1
15	90002-047	Tube Nut, .25T, P.P.	4	39	90003-513	Bumper Feet	4
16	71000-204	Adapter S/A Bullet .37T Viton	4	40	70000-589	Connector Liq-Tite w/nut	1
17	71000-205	Adapter S/A Bullet .37T EP	4	41	90010-110	Cord 18/3 SJTW/A 115v	1
18	71000-224	Adapter S/A Bullet .37T Silicon	4		90010-128	Cord 18/3 SJTW/A European BLK	1
19	71000-225	Adapter S/A Bullet .25T Viton	4		90010-133	Cord 18/3 SJTW/A 230v BLK	1
20	71000-226	Adapter S/A Bullet .25T EP	4	42	71000-133	Cover, Junction Box with Gasket and Label	1
21	71000-227	Adapter S/A Bullet .25T Silicon	4	43	90007-515	Bushing, Junction Box Connector, Alum.	1
22	71000-195	Cartridge Bullet Valve S/A, Double-Ball	2	44	76000-522	Junction Box, Valox	1
23	70004-074	Cover P/Head, HD Chem-Feed logo	2	45	90011-129	Screw, Cover, 6-32 X .25 Phil Pan SS Black	2
24	70004-071	Cover P/Head, HD Noir logo	2	46	90006-598	Fan, 1.80" Diameter, Alum.	1
25	70004-086	Cover P/Head, HD Micro logo	2	47	90011-022	Screw, Motor, 8-32 X 2.5" Phillips Steel	2
26	90011-141	Screw 10-32 x 1.25	4	48	70000-028	Bearing Bracket With Bearing	2
27	90002-146	P/Head Noir Molded, P.P.	2	49	70000-027	Rotor Assembly With Shaft And Spacers	1
28	76000-168	Tubing D/Charge, 3/8 x 5FT	2	50	70000-018	Stator S/A, 115V60Hz Standard Blue-Black	1
29	76000-169	Tubing D/Charge, 1/4 x 5FT.	2		70000-019	Stator S/A, 115V60Hz Thermal Blue-Yellow	1
30	C-406 VT-17N	Diaphragm S/A 2.0 17N, Viton/TFE	2		71000-019	Stator S/A, 220V50Hz Standard Brown-Black	1
31	C-406T-17N	Diaphragm S/A 2.0 17N, EP/TFE	2		71000-020	Stator S/A, 220V50Hz Thermal Brown-Yellow	1
32	R-106VT-17N	Diaphragm S/A 1.6 17N, Viton/TFE	2		70000-020	Stator S/A, 230V60Hz Standard Red-Black	1
33	R-106T-17N	Diaphragm S/A 1.6 17N, EP/TFE	2		70000-021	Stator S/A, 230V60Hz Thermal Red-Yellow	1
34	90006-022	Return Spring C-1700N	4		70000-072	Stator S/A, 24V60Hz Standard Blue-White	1
35	76000-288	Stirr-up	2	51	90011-024	Ground Screw 8-32 x .25 Hex SL ST	1
36	90002-001	Slide Bearing	4	52	90010-127	Lead Wire, ground, Green	1
37	90001-132	Offset Cam #1 .125"	2	53	90011-078	Washer, Ground Screw, #8 Intrl/Star	1
38	90001-133	Offset Cam #2 .055"	2	54	71000-268	Gearbox, 14 RPM	1
39	90001-134	Offset Cam #3 .187"	2		71000-269	Gearbox, 30 RPM	1
40	90001-141	Offset Cam #4 .100"	2		71000-270	Gearbox, 45 RPM	1
41	90002-017	Dial Knob	2		71000-271	Gearbox, 60 RPM	1
42	90012-220	Label, Top Cover	2		71000-272	Gearbox, 125 RPM	1
43	90011-168	Screw #6 x .62 PH oval 'A'	1	55	70000-439	Injection Valve S/A 37T VIT 1/2 PSI	1
44	76000-938	Top Cover	4	(N/s)	90010-153	Cycle Timer 5 Sec. 24V-115V-230V 50/60 Hz	1
45	90011-121	Thumb Screw 6-32 x 1.125	1	(N/s)	90010-151	Cycle Timer 1 Min. 24V-115V-230V 50/60 Hz	1
46	90006-599	Gasket, Top Cover	2	(N/s)	90010-152	Cycle Timer 10 Min. 24V-115V-230V 50/60 Hz	1
47	90004-005	Bearing, Top Cover	1				