Operating Manual

FLEXFLO®
A-100NF & A100NV

Peristaltic Metering Pump

Blue-White®

READ THE ENTIRE OPERATING MANUAL PRIOR TO INSTALLATION AND USE.

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1.0 Introduction

Congratulations on purchasing the A-100N Peristaltic Metering Pump!

The A-100N is designed to inject chemicals into piping systems. The A-100N is capable of pumping a variety of chemicals and solutions.

Variable Speed Controller - The speed of the pumping mechanism is adjustable from 5%/10% through 100%. (adjustment % varies with motor speed models)

The A100N is available with two control options:

Digital Control - (Model A-100NV) Includes digital interface, 4-20ma input, 0-10VDC input, Frequency Input.

Analog Control - (Model A-100NF) Includes manual speed control via adjustable knob.

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 the pre-installed tube assembly.

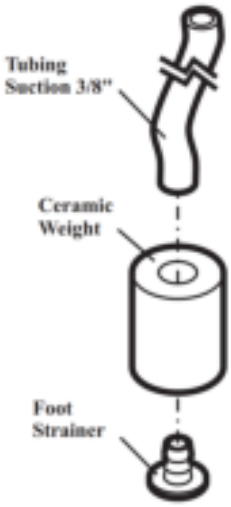
1.1 Features

- Peristaltic Pump Tube does not require valves.
- Self priming under maximum pressure. Cannot vapor lock.
- High outlet pressure capability of 100 psig (most models).
- High inlet suction lift capability of 30 feet.
- Flows up to 5.2 gph / 124 gpd / 20 lph.
- Variable speed motor.
- Patented pump tube assembly design.
- Flex-A-Prene®, Flex-A-Chem®, and Flex-A-Thane® tube material options.
- Tube Failure Detection (TFD) system.
- Includes Flow Verification System (FVS) - sensor sold separately.
- 1 amp alarm relay (dry contact) - “V” model only.
- Alarm and Service alert icon displays - “V” model only.
- Corrosion proof Valox housing.
- Tamper resistant electronic control panel cover.
- NSF/ANSI 61 listing on certain models.

1.2 What's in the Box?

Your pump package should contain the following:

- Injector pump with 2 pump tube assemblies (1 tube installed in pump)
- Tube nuts (2)
- Suction tube foot strainer
- Ceramic tubing weight
- 5' Length of clear PVC suction tubing, 1/4" ID x 3/8" OD
- 5' Length of opaque LLDPE discharge tubing, 1/4" ID x 3/8" OD



- Injection fitting with internal back-flow check valve
- Mounting hardware kit
- Shroud (Weather proof cover see page 6)

Note: If pump is ordered with NSF 61 option, the strainer, weight, tubing, and injection fitting will not be included.

1.3 Storage and Handling

The A-100N Peristaltic Pump is shipped to withstand standard shipping methods. If your pump has arrived with damaged packing, note damage and check contents immediately.

Contact factory if pump or components have sustained damage. Shipping damage is not covered under warranty and will be addressed according to Blue-White freight terms and policy.

If the pump will not be installed at time of arrival, store the pump in original packaging indoors in an air conditioned environment. Do not store pump in excessive heat or freezing temperatures, or in environments with high humidity. Do not stack other boxes or equipment on top of the pump/packaging/box.

When preparing to install pump, keep it away from excess dust or unusual chemical/moisture exposure. Do not drop the pump or handle in such a way as to cause high impact. Always handle pump with care.

If there is any question about how to store or handle the pump and accessories, please contact the factory or authorized service center for assistance customerservice@blue-white.com (714) 893-8529.

1.4 Product Matrix

Model Number Matrix

A100N

FLEXFLO® Model Number

A1N FLEXFLO® Peristaltic Metering Pump

Maximum Motor RPM

0	14 RPM
1	30 RPM
2	45 RPM
3	60 RPM

Power Cord

0	115V / 60HZ, power cord NEMA 5/15 plug (US)
1	220V / 50HZ, power cord CEE7/VII plug (EU)

Input/Output Control

F	Analog Manual Speed Control (Dial Knob)
V	Digital Speed Control with external input (4-20ma, 0-10VDC, and Frequency/Pulse)

Pump Tube Material, Pump Tube Size, Flow Rate

1	1/4” OD Flex-A-Thane®, 65 PSI (14 RPM = 5.7 GPD, 30 RPM = 13.3 GPD, 45 RPM = 20.5 GPD, 60 RPM = 25.5 GPD)
2	3/8” OD Flex-A-Thane®, 65 PSI (14 RPM = 12.2 GPD, 30 RPM = 28.5 GPD, 45 RPM = 43.6 GPD, 60 RPM = 53.3 GPD)
3	7/16” OD Flex-A-Thane®, 50 PSI (14 RPM = 27.8 GPD, 30 RPM = 65.8 GPD, 45 RPM = 99.2 GPD, 60 RPM = 124 GPD)
4	1/4” OD Flex-A-Prene®, 100 PSI (14 RPM = 2.3 GPD, 30 RPM = 4.9 GPD, 45 RPM = 8.0 GPD, 60 RPM = 9.5 GPD)
6	3/8” OD Flex-A-Prene®, 100 PSI (14 RPM = 6.9 GPD, 30 RPM = 16.0 GPD, 45 RPM = 24.0 GPD, 60 RPM = 30.1 GPD)
7	7/16” OD Flex-A-Prene®, 50 PSI (14 RPM = 21.7 GPD, 30 RPM = 52.5 GPD, 45 RPM = 76.1 GPD, 60 RPM = 95.1 GPD)
8	7/16” OD Flex-A-Chem®, 50 PSI (14 RPM = 15.2 GPD, 30 RPM = 31.9 GPD, 45 RPM = 53.3 GPD, 60 RPM = 68.4 GPD)

NSF Certification

(Blank)	None
X	NSF 61 certified (only with -4T, -6T, -7T, and -8T tubes) (ships without accessories)

A1N	0	0	F	-	1	T	-		Sample Model Number

1.5 Application Guides

If you are unsure that your A-100N pump is correct for your application, please contact our factory for assistance. Additionally, resources are available on our website to assist with application review.

Chemical Resistance Guides - Charts include most common chemicals compatibility with Flex-A-Prene, Flex-A-Chem, and Flex-A-Thane tubing. www.blue-white.com/resources/tubes-and-chemical-compatibility/

Viscosity Effects - Learn how viscosity can affect pump performance. www.blue-white.com/article/achieving-successful-dosing-of-viscous-or-abrasive-chemicals/

Suction Lift - Learn how suction lift can affect pump performance. www.blue-white.com/bw-videos/bwa-suction-lift-explained-the-key-to-pump-performance/

Other concerns - Visit our Help Center where you can review specific information about the A-100N pump and ask Oswald AI Chat questions. www.blue-white.com/resources/help-center/

1.6 Accessories and Options

WALL MOUNT BRACKET

The Wall Mount Bracket is a simple way to mount your pump without using valuable floor space. The bracket is sturdy and versatile and allows the pump to be mounted at a convenient height for operation and service.

KIT-PSM One HDPE Bracket, (4) 3/8” x 2-3/4” long anchor bolts.

SUCTION AND DISCHARGE TUBING

C-334-6 Tubing, Suction, clear PVC 3/8” O.D. x 5’ length
C-334-6-10 Tubing, Suction, clear PVC 3/8” O.D. x 10’ length
C-334-6-100 Tubing, Suction, clear PVC 3/8” O.D. x 100’ length
C-335-6 Tubing, Discharge, opaque PE 3/8” O.D. x 5’ length
C-335-6-10 Tubing, Discharge, opaque PE 3/8” O.D. x 10’ length
C-335-6-100 Tubing, Discharge, opaque PE 3/8” O.D. x 100’ length

TANKS

High strength polyethylene tanks are available to store chemicals. STAR III tanks at capacities of 7 gal, 15 gal, or30, gal. Cylindrical tanks at capacities of 15 gal, 30 gal, or 50 gal.

INJECTION FITTINGS

Injection fittings ensure that chemical feed injects into the process stream while preventing the process fluid from returning to the chemical line. The built-in check valve contains a ceramic ball that prevents siphoning, which makes changing a tube an easy process.

Part Number	Description	Material (Body/O-ring	Spring
A-014N-6A	Injection Valve, PP/FKM, ¼”x3/8” tube connection	Polypro/FKM	½ psi
A-014N-6E	Injection Valve, PP/EP, ¼”x3/8” tube connection	Polypro/EP	½ psi
A-014NK-6A	Injection Valve, PVDF/FKM, ¼”x3/8” tube connection	PVDF/FKM	½ psi
A-014NK-6E	Injection Valve, PVDF/EP, ¼”x3/8” tube connection	PVDF/EP	½ psi
A-014NK-6A-T	Injection Valve, PVDF/FKM, ¼”x3/8” tube connection (PTFE Ball)	PVDF/FKM (PTFE ball)	½ psi
71000-770	Injection Valve, PVDF/FKM, ½” Hose Barb	PVDF/FKM	2 psi
71000-377	Injection Valve, PVDF/EP, ½” Hose Barb	PVDF/EP	2 psi
71000-767	Injection Valve, PVDF/FKM, ½” MNPT	PVDF/FKM	2 psi
71000-386	Injection Valve, PVDF/EP, ½” MNPT	PVDF/EP	2 psi
71000-985	Injection Valve, PVDF/FKM, ½” MNPT (PTFE Ball)	PVDF/FKM (PTFE ball)	2 psi

2.0 Engineering Specifications

Max. Working Pressure	Up to 100 psig (6.9 bar) (see below for specific pressure ratings for tubes)
Max. Fluid Temperature	130° F (54° C)
Max. Ambient Temperature	14 to 110° F/ -10 to 43° C
Max. Viscosity	5,000 Centipoise
Max. Suction Lift	30 ft. Water at sea level (14.7 atm psi)
Operating Voltage	115VAC/60Hz, 1ph (14 & 30 RPM = 1.37 Amp Max.) (45 & 60 RPM = 1.87 Amp Max.) 220VAC/50Hz, 1ph (14 & 30 RPM = 0.68 Amp Max.) (45 & 60 RPM = 1.14 Amp Max.)
Power Cord Options	115V 50/60Hz = NEMA 5/15 (USA) 220V 50/60Hz = NEMA 6/15 (EU)
Motor	Variable Speed DC, 90VDC
Duty Cycle	Continuous
Flow Adjustment Range	0.1 - 124 GPD (0.3 - 326 mL/min)
Output Adjustment Range	10% – 100% motor speed (5% -100% on certain models.)
Solids	50% by volume
Programmable Input (V Model Only)	4-20 mA, 0-10 VDC, Pulse/Frequency
TFD (Tube Failure Detection)	Patented conductive pins will sense leaks and stop the pump. “V” model. Triggers Alarm Output (contact closure.) Displays “Alarm”. “F” model. Will stop pump and activate open collector output. 6-30vdc collector voltage. 50mA max sinking current. (optional wiring)
FVS (Flow Verification System)	Compatible with optional pulse flow sensor. “V” model. Triggers Alarm Output (contact closure.) Displays “Alarm”. “F” model. Will activate open collector output. 6-30vdc collector voltage. 50mA max sinking current. Contact factory for sensor options.
Motor Active	Open collector output. 6-30vdc collector voltage. 50mA max sinking current.
Enclosure	NEMA 3R, IP23, Valox PBT
Product Weight	“V” model 12 lb. (5.4 Kg) “F” model 8 lb. (3.6 Kg)
Approximate shipping wt	10 lb. (4.5 Kg)
Standards	RoHS, CE, cETLus, NSF/ANSI 61(must be specified in model number), BABAA

2.1 Output Specifications

Maximum Flow Rates (based on running water at 70° F at sea level)

Tube	Max Pressure PSI (bar)	14 RPM MODELS					30 RPM MODELS					45 RPM MODELS					60 RPM MODELS*				
		GPD	GPH	OZ/MIN	ML/MIN	LPH	GPD	GPH	OZ/MIN	ML/MIN	LPH	GPD	GPH	OZ/MIN	ML/MIN	LPH	GPD	GPH	OZ/MIN	ML/MIN	LPH
1	65(4.5)	5.7	0.24	0.51	15	0.90	13.3	0.55	1.18	35	2.1	20.5	0.86	1.83	54	3.24	25.5	1.06	2.26	67	4.02
2	65(4.5)	12.2	0.51	1.08	32	1.92	28.5	1.19	2.54	75	4.5	43.6	1.82	3.89	115	6.90	53.3	2.22	4.73	140	8.40
3	50(3.5)	27.8	1.16	2.47	73	4.37	65.8	2.74	5.85	173	10.38	99.2	4.14	8.82	261	15.66	124	5.17	11.01	326	19.56
4	100(6.9)*	2.3	0.10	0.20	6.0	0.36	4.9	0.21	0.44	13	0.78	8.0	0.33	0.71	21	1.26	9.5	0.40	0.85	25	1.50
6	100(6.9)*	6.9	0.30	0.60	18.4	1.10	16.0	0.67	1.42	42.1	2.5	24.0	1.0	2.13	63.1	3.8	30.1	1.25	2.67	79.2	4.7
7	50(3.5)	21.7	0.90	1.92	57.0	3.40	52.5	2.19	4.66	138	8.3	76.1	3.17	6.76	200	12.0	95.1	3.96	8.45	250	15.0
8	50(3.5)	15.2	0.63	1.35	40.0	2.40	31.9	1.31	2.80	84	5.04	53.2	2.22	4.73	140	8.4	68.4	2.85	6.10	180	10.8

* See pressure rating for specific tubes. Note: -4, -6 Tubes max pressure for 60 rpm model is 75 psi
Flex-A-Thane = 1, 2, and 3 tubes.
Flex-A-Prene = 4, 6, and 7 tubes.
Flex-A-Chem = 8 tube.

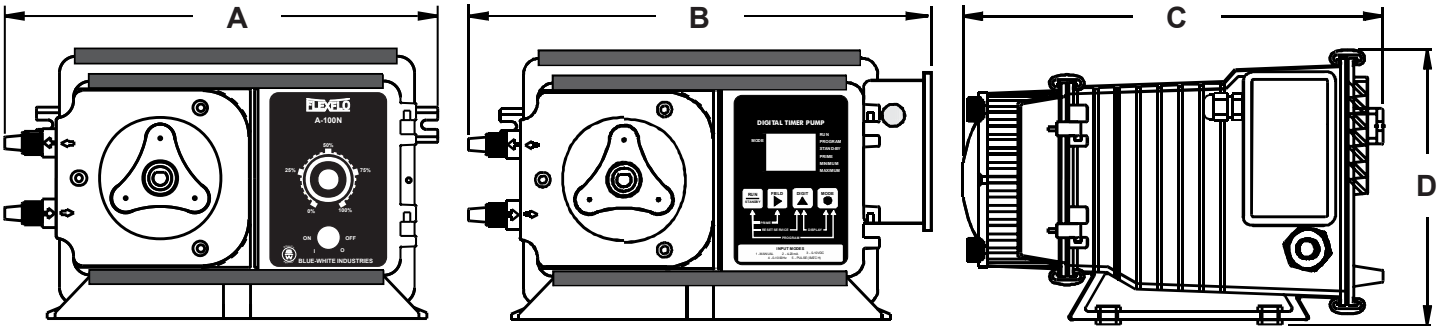
2.2 Materials of Construction

Non-wetted Components:	
Enclosure:	Valox® (PBT) thermoplastic
Pump Head:	Valox® (PBT) thermoplastic
Pump Head Cover:	Clear Acrylic
	Permanently lubricated sealed motor shaft support bronze sleeve bearing.
Cover Screws:	Stainless steel, polypropylene cap
Roller Assembly:	Rotor: Valox® (PBT)
	Rollers: Nylon
	Roller Bearings: Bronze
TFD System Sensor:	Hastelloy C-276
Power Cord:	3 Conductor, SJTW-A water-resistant
Hardware:	Stainless Steel
Shroud:	Valox® (PBT) thermoplastic

Wetted Components:	
Pump Tube Assembly*:	Tubing: Flex-A-Prene®, Flex-A-Thane®, Flex-A-Chem®
	Adapter Fittings: PVDF (1/4” x 3/8” tube connection)
Injection / Back-Flow Check Valve:	Body & Insert: Polypropylene
	Check Ball: Ceramic
	Spring: Hastelloy C-276
	Ball Seat O-Ring: TFE/P
	Static Seal O-Ring: FKM
Ancillary Items Provided:	Suction Tubing: 3/8” OD x 1/4” ID x 5’ Clear PVC
	Discharge Tubing: 3/8” OD x 1/4” ID x 5’ Polyethylene (LLDPE)
	Suction Strainer: Polypropylene
	Weight: Ceramic

* One spare tube provide with pump.

2.3 Dimensions



Analog Units
A-100NF

Digital Units
A-100NV

Dim	Inch	cm
A	9.375”	23.81
B	9.50”	24.10
C	9.125”	23.18
D	6.00”	15.24

3.0 Installation

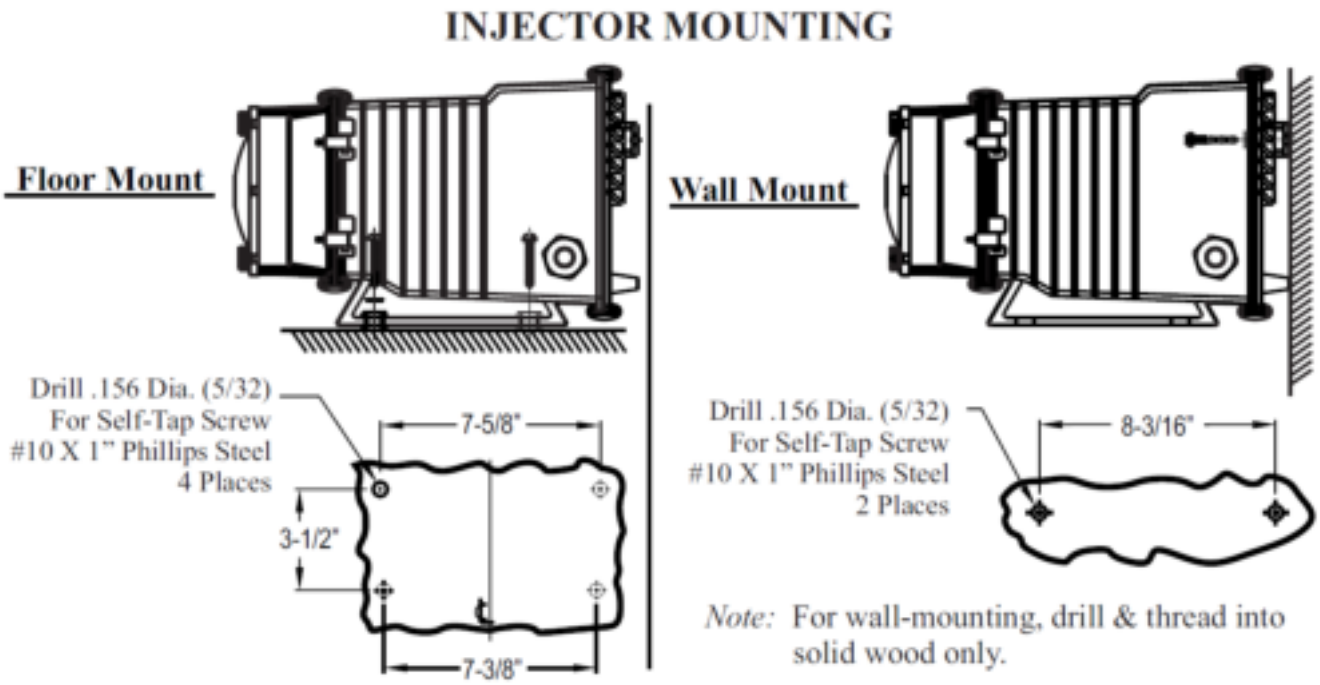
CAUTION: Proper eye protection must be worn at all times when installing and servicing the pump.

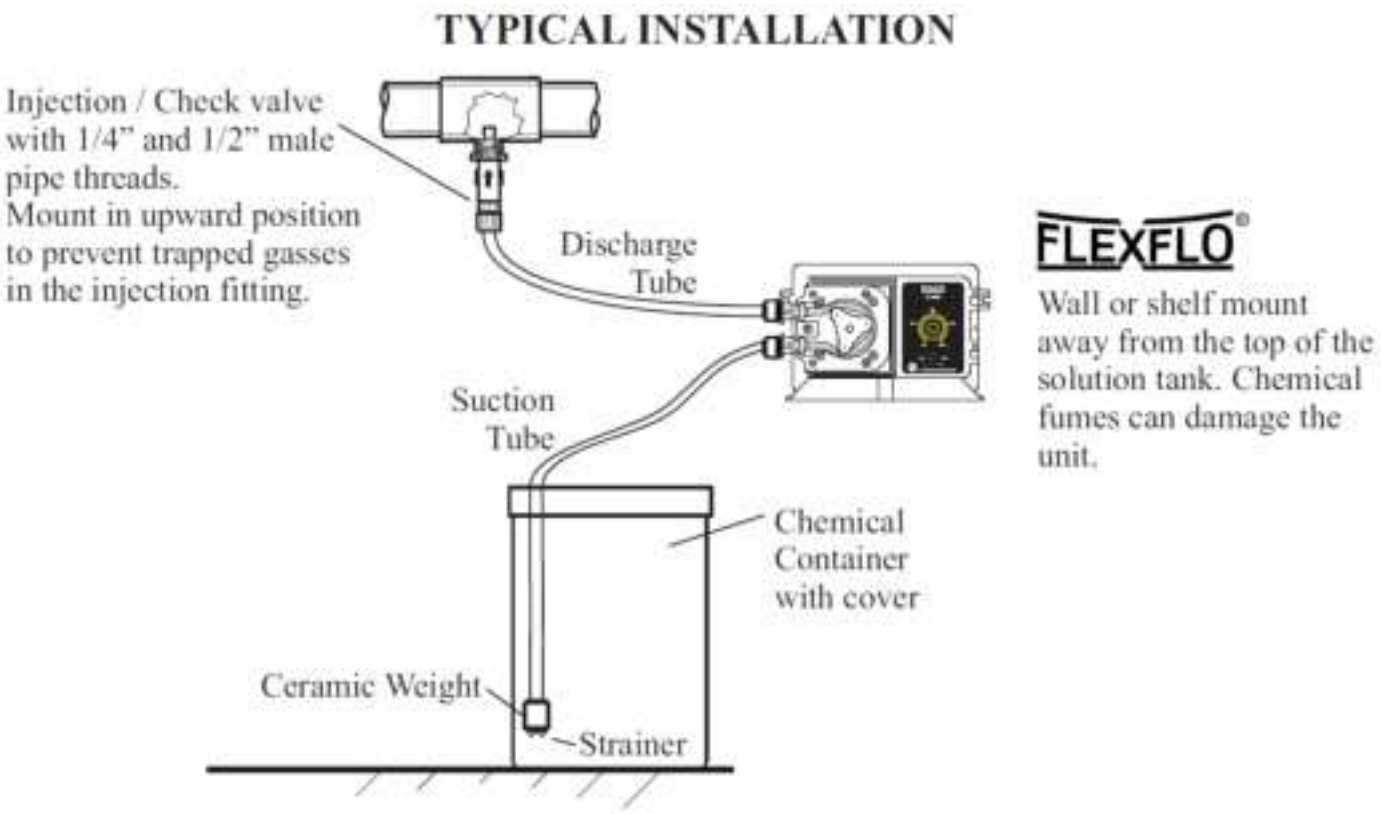
Note: All diagrams are strictly for guideline purposes only. Always consult an expert before installing the pump into specialized systems. The pump should be serviced by qualified persons only.

3.1 Mounting Location

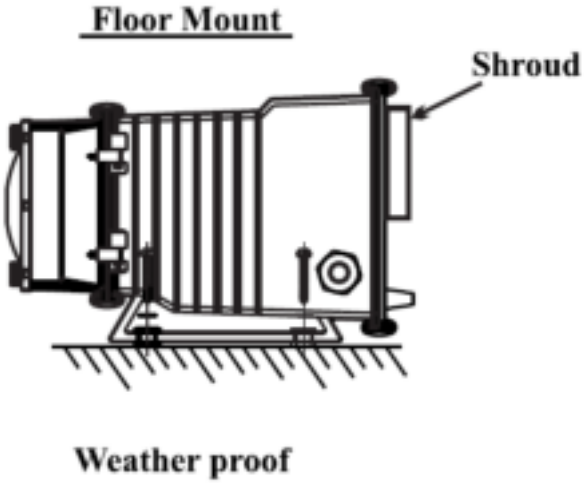
Choose an area located near the chemical supply tank, chemical injection point and electrical supply. Although the pump is designed to withstand outdoor conditions, a cool, dry, well ventilated location is recommended. Install the pump where it can be easily serviced.

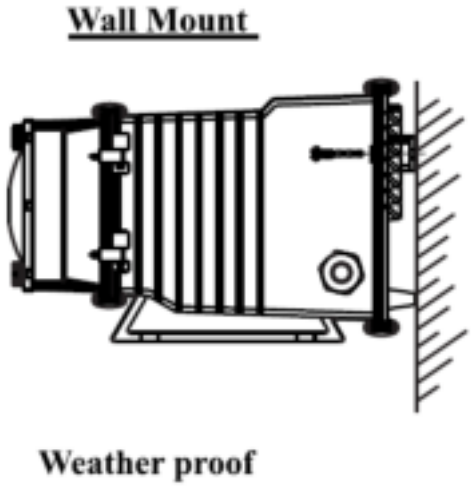
- Mount the pump to a secure surface or wall using the enclosed hardware.
- Wall mount to a solid surface only. Mounting to drywall with anchors is not recommended.
- Mount the pump close to the injection point. Keep the outlet (discharge) tubing as short as possible. Longer tubing increases the back pressure at the pump tube.
- 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.
- Mounting the pump lower than the chemical container will gravity feed the chemical into the pump. This “flooded suction” installation will reduce output error due to increased suction lift. You must install a shut-off valve, pinch clamp or other means to halt the gravity feed to the pump during servicing.
- Be sure to install a back-flow prevention check valve.
- An anti-siphon valve is not required. siphoning cannot occur.





Rear Shroud - This shroud is designed to weather-proof the A-100N pump. If the pump is wall mounted, the shroud is not necessary and will be considered weather-proof.





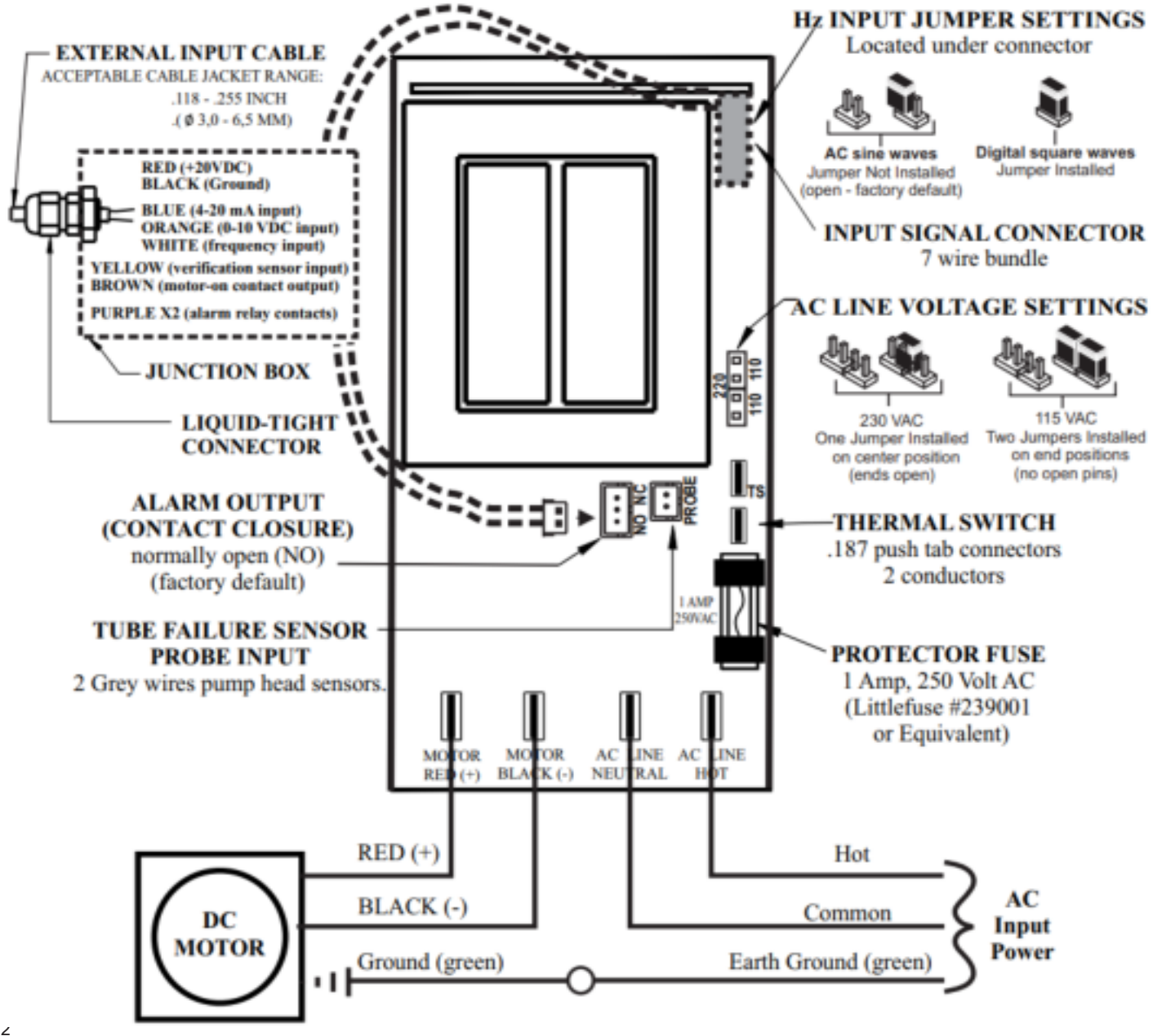
3.2 Input Power Connection

WARNING! Risk of Electrical 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.
- Jumper pins on the circuit board are factory preset for the correct voltage. See Circuit Board Connections diagrams for details.
- The pump is supplied with a ground wire conductor and a grounding type attachment plug (power cord). To reduce the risk of electric shock, be certain that the power cord is connected only to a properly grounded, grounding type receptacle.

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

3.3 A-100NV CIRCUIT BOARD



3.4 External Signal Wiring (A-100NV)

The pump will accept any one of three different types of external input signals; 4-20 mA , 0-10 VDC, or pulse frequency (500 Hz maximum). 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. A jumper plug located on the circuit board is factory pre-set for AC sine wave signals, the jumper must be re-positioned when digital square wave signals are being used. See previous page.

All wiring connections are to be made inside of the junction box located on the side of the pump. A liquid-tight connector is supplied and should be used for the external signal cable. The signal input wires are color coded to the type of signal being used.

Signal Input/Output Wire Color Codes / External Signal Wiring A-100NV

INPUT TYPE	WIRE COLOR CODE
4-20 mA (loop resistance = 250 ohm)	**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. 1 AMP MAX @ 125VAC (24VDC)	**PURPLE & PURPLE**
FLOW VERIFICATION SENSOR	**RED** (+ 20VDC) **BLACK (-)** **YELLOW** (signal)
MOTOR ON SIGNAL 6-30V DC open collector output closed while motor is energized	**BROWN (+) & BLACK (-)** **pull-up resistor required - see schematic next page**

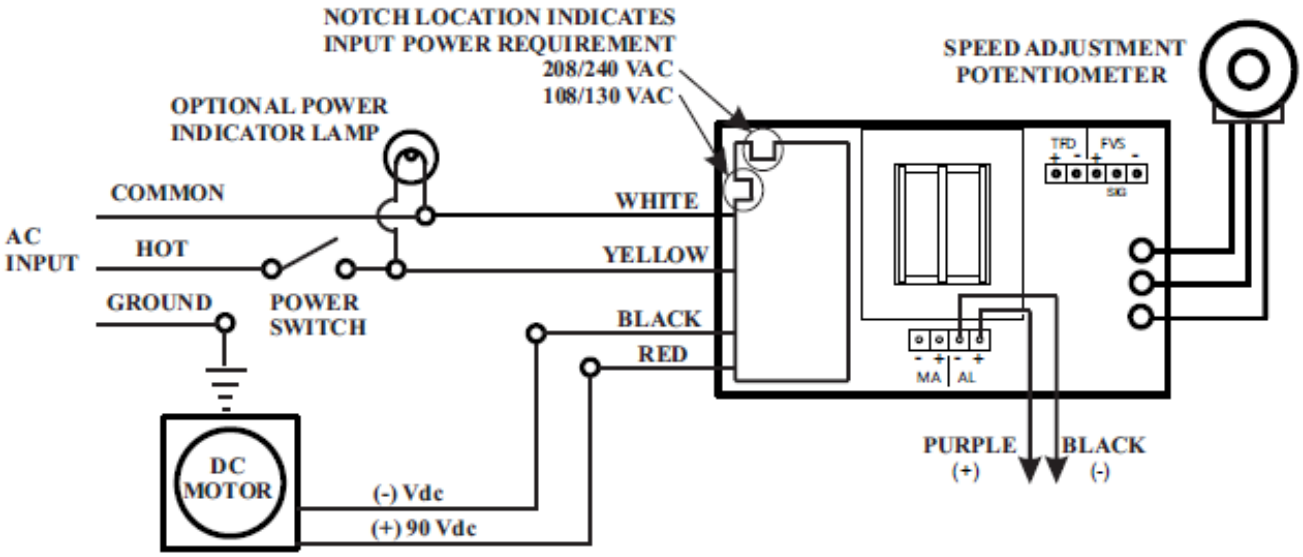
FVS Paddlewheel Sensor Signal Input Wiring

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

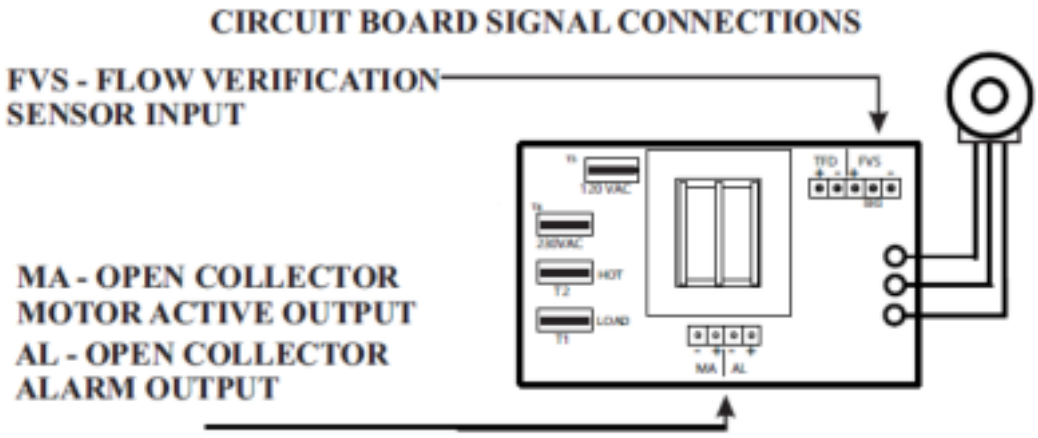
3.5 A-100NF CIRCUIT BOARD

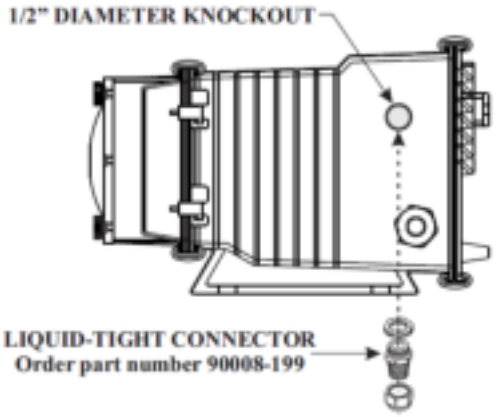
The A-100NF contains internal wiring that need not be accesses under normal operation.

Access to internal wiring is required when changing input power voltage, connecting FVS wiring, disconnecting TFD sensor, and wiring Alarm output and Motor Active outputs. A liquid-tight connector is needed (optional) to wire the output connections.



WIRING DIAGRAM - Model A-100NF





3.6 FVS, Alarm Output, and Motor Active Wiring

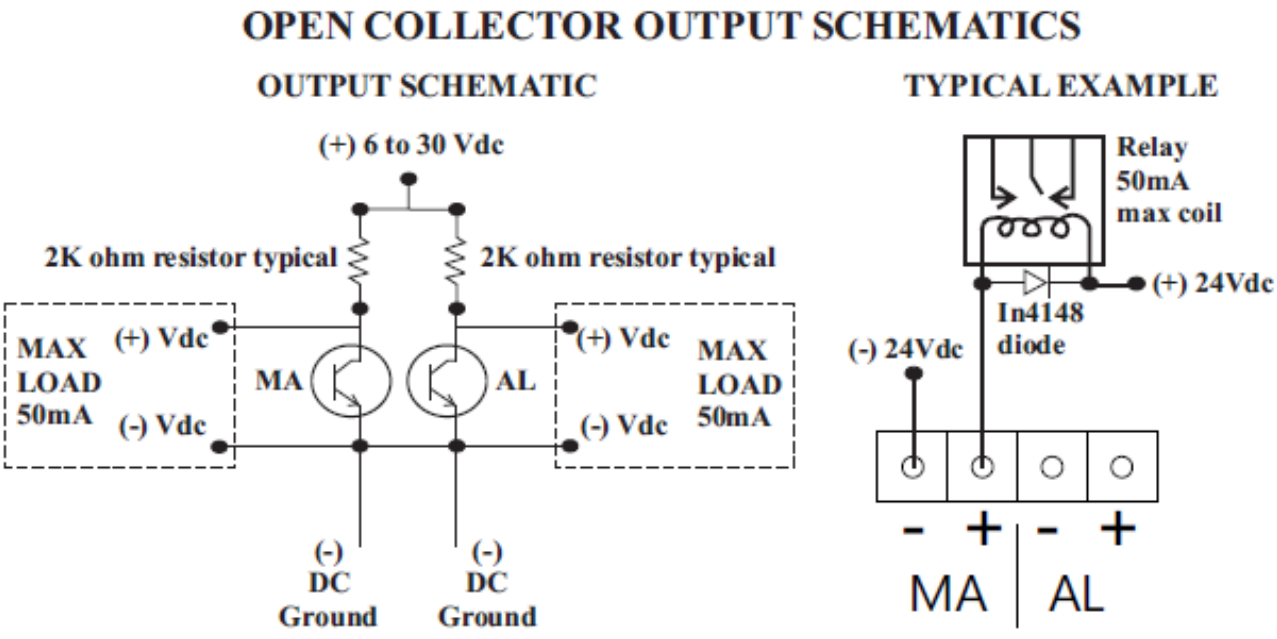
Optional circuit board signal connection installation - The pump includes three optional external signal connections:

FVS - FLOW VERIFICATION SENSOR INPUT
Accepts a pulse signal from an optional Blue-White sensor confirming that fluid is passing through the pump. Triggers the AL alarm output if fluid is not detected.

AL - ALARM OPEN COLLECTOR OUTPUT
The output (purple wire) sinks to DC ground when an alarm condition exists. 6-30Vdc collector voltage. 50mAdc maximum sinking current.

MA - MOTOR ACTIVE OPEN COLLECTOR OUTPUT
The output (brown wire) sinks to DC ground when the motor is de-energized. 6-30Vdc collector voltage. 50mAdc maximum sinking current.

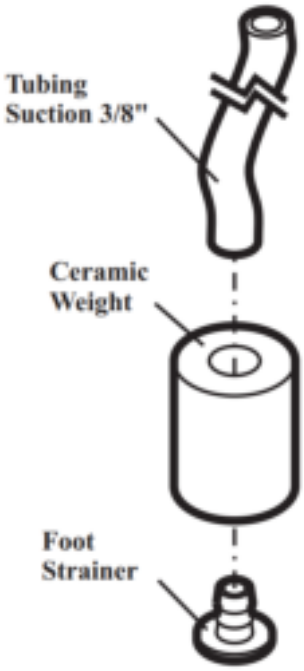
All signal wires must be connected to the circuit board, located inside the pump enclosure, using connector plug wiring assemblies. A liquid-tight connector must be installed in the pump enclosure wall and the signal wires passed through the liquid-tight connector and secured. See pages 8 & 9 for wiring details.
1. Remove the rear enclosure panel.
2. Remove knock-out using a screwdriver.
3. Trim edge with a knife and remove sharp edges.
4. Install the provided liquid-tight connector.
5. Connect the connector plug to the circuit board.



3.7 How to Install Tube and Fittings

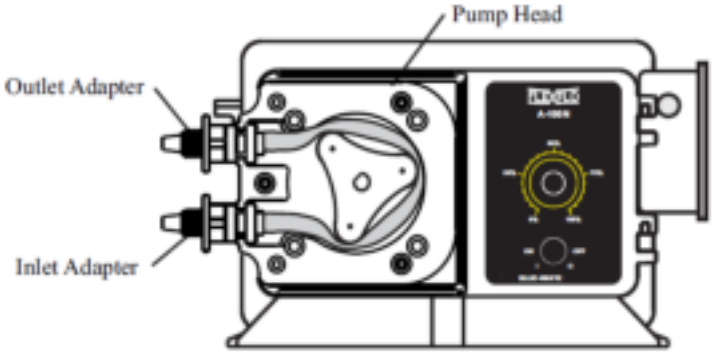
CAUTION: Proper eye and skin protection must be worn when installing and servicing the pump!

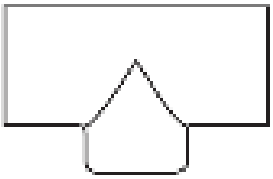
Inlet Tubing - Locate the inlet fitting of the Pump Tube. Remove the tube nut. Push the clear PVC suction tubing onto the compression barb of the fitting. Use the tube nut to secure the tube. Hand tighten only.



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. Slip the ceramic weight over the end of the suction tube. Press the strainer into the end of the tube. Secure the ceramic weight to the strainer. Drop the strainer into the solution tank.

Outlet Tubing - Locate the outlet fitting of the Pump Tube. 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. Keep outlet tube as short as possible.

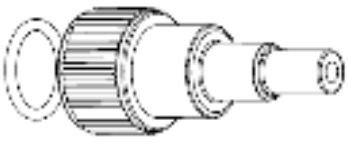




Injection/Check Valve Fitting Installation - The Injection/Check valve fitting is designed to install directly into either 1/4” or 1/2” female pipe threads. This fitting will require periodic cleaning, especially when injecting fluids that calcify such as sodium hypochlorite.

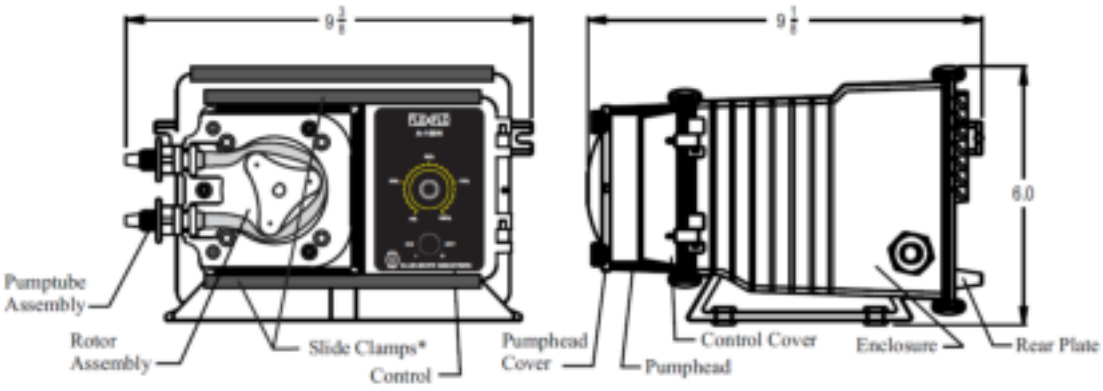
Install the Injection/Check valve directly into the piping system. To prevent trapped gases, install the fitting in an upward direction. Use PTFE thread sealing tape on the pipe threads.

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.

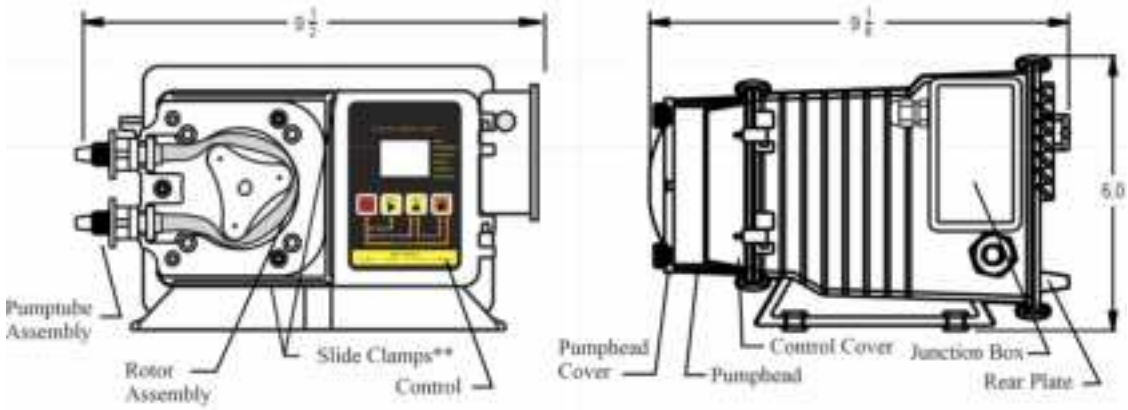


4.0 A100N Controls

A-100NF PARTS LOCATOR DRAWING



A-100NV PARTS LOCATOR DRAWING

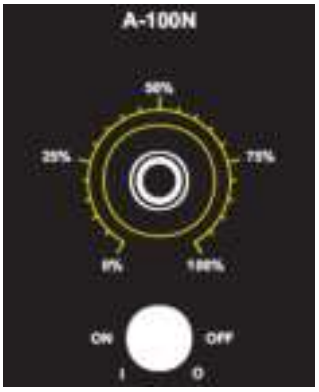


* Slide both top and bottom clamps to the left only far enough to open the control cover

4.1 A100NF Pump Output Adjustment and Controls

Turn Pump On/Off

To activate pump, flip switch to “ON”. To de-activate pump, flip switch to “OFF”.



How to Adjust The Output

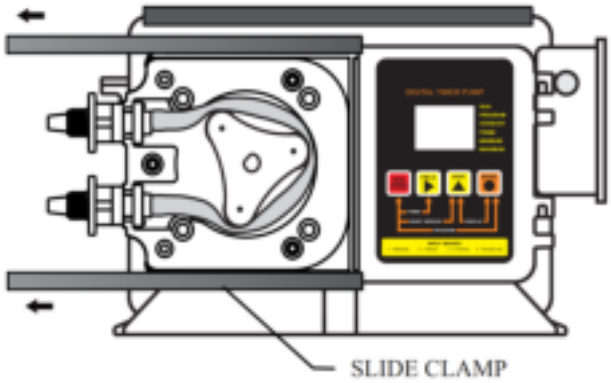
To adjust the pump output - Slide the slide clamps to the left only far enough to open the control panel door.

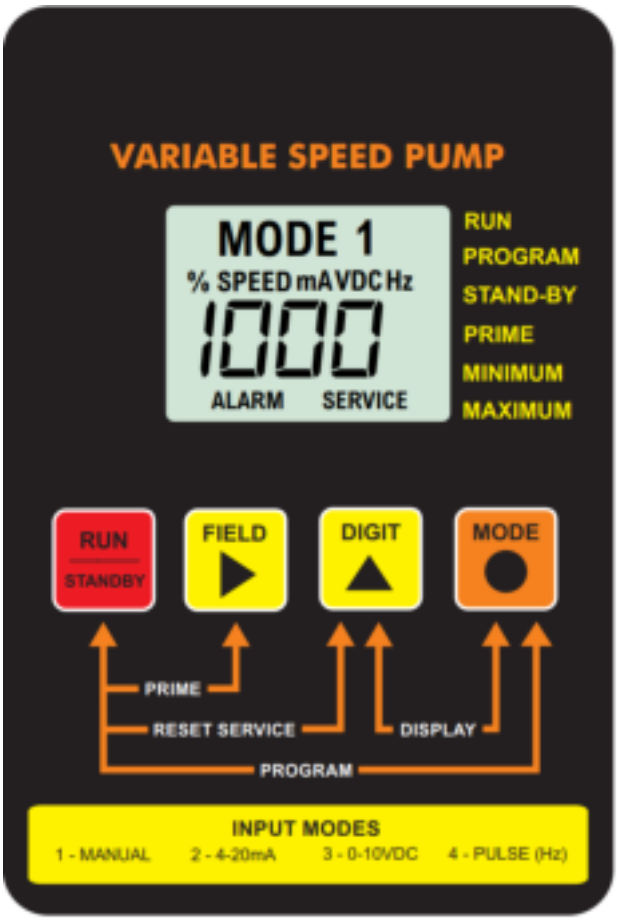
The speed of the pumping mechanism is adjustable up to 5%/10% through 100%. Turn the adjustment knob to the desired percentage of speed. (Refer to Output Specifications for exact turndown for your model.)

Caution: When power is applied to the pump, the A-100N will either automatically begin to pump, or maintain power-off status, depending on the power switch status.

4.2 A100NV Pump Output Adjustment and Controls

Adjustment Controls - Open the control panel door by sliding the upper and lower slide clamps to the left.





RUN/STANDBY Button -

- Press to start and stop the pump. The **ARROW** next to the word **RUN** will light when in the run mode. The **ARROW** next to the word **STAND-BY** will blink when in the stand-by mode.
- Press to clear **ALARM**.
- When pressed with the **FIELD** Button, initiates a 99 second prime cycle which temporarily overrides the mode setting and runs the pump motor at 100% speed. The **ARROW** next to the word **PRIME** will blink.
- When pressed with the **DIGIT** button, resets the 500 hour service warning timer to zero.
- When pressed with the **MODE** button, initiates the programming mode. The **ARROW** next to the word **PROGRAM** will blink.

FIELD Button -

- In the programming mode, selects the digit to be changed.
- When pressed with the **DIGIT** button, initiates the Flow Verification Sensor feature and allows programming the alarm delay from 1-256 seconds.

DIGIT Button -

- In the programming mode, increases the selected digit.
- When pressed with the MODE Button, toggles the display from % motor speed to input signal value.

MODE Button -

Used to select one of four operating modes.
Mode 1 - Manual Adjustment (external input disabled)
Mode 2 - 4-20mA input
Mode 3 - 0-10VDC input
Mode 4 - Frequency (Hz) input

Caution: When power is applied to the pump, the A-100N will either automatically begin to pump, or maintain power-off status, depending on the power switch status.

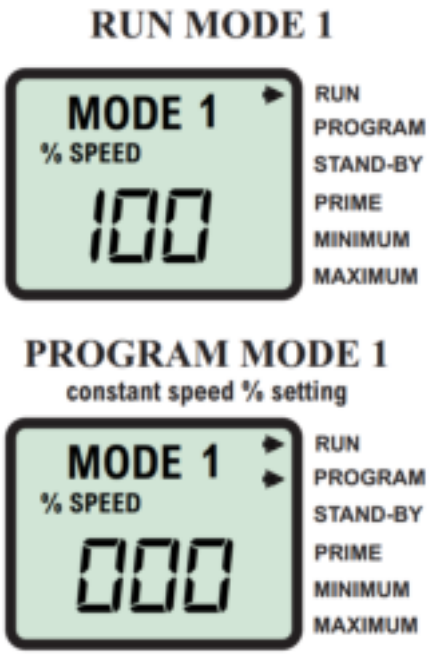
4.2.1 A100NV OPERATING MODE 1 - Output Adjusted Manually

In this mode, the pump's motor speed is adjusted manually using the front panel touch pad. The motor speed can be adjusted from 10-100%. To adjust the speed:

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 3-DIGIT LCD will indicate the currently programmed percentage of speed.

Enter the programming mode.
At the same time, press the RUN/STANDBY button and the MODE button. A blinking ARROW will point to the word PROGRAM indicating the program mode has been activated.

- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.
- To exit the programming mode, press the RUN/STANDBY button and the MODE button at the same time. The arrow next to the word PROGRAM will disappear.

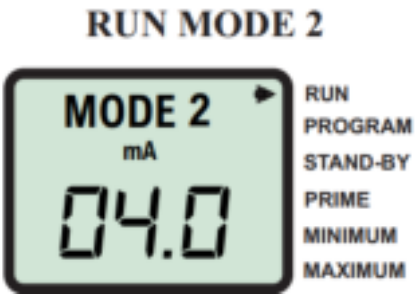


NOTE: If while in the program mode no buttons are pressed within 20 seconds, the circuitry will automatically return to the run mode, without saving changes

4.2.2 A100NV OPERATING MODE 2 - 4-20 mA input signal

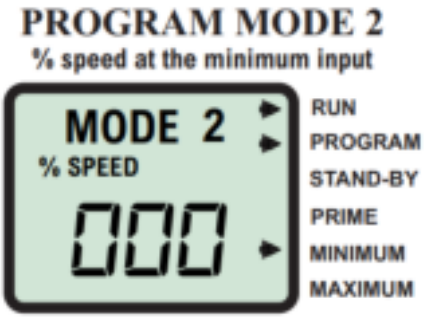
In this mode, the pump's motor speed is adjusted automatically based on the value of the 4-20 mA input signal. Any motor speed can be assigned to either the minimum or maximum milliamp input values.
However, the programmed minimum mA value must be less than the programmed maximum mA value. **The ALARM and SERVICE icons will blink if the programming is in error.**

To assign the minimum and maximum motor speed and the minimum and maximum mA input signal values:



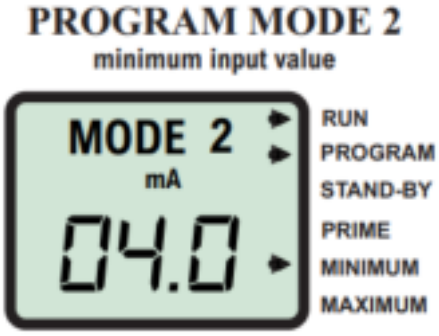
Set the pump for MODE 2. Press the **MODE** button until **MODE 2** is shown on the LCD display. The **%SPEED** or **mA** icon will light depending on the current display setting. The large **3-DIGIT LCD** will indicate the **current motor speed or the current mA input value.**

Enter the programming mode. At the same time, press the RUN/STANDBY and MODE buttons. A **blinking ARROW** will point to the word **PROGRAM** indicating the program mode is activated. A blinking ARROW will point to the word MINIMUM indicating 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 FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT 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 3-DIGIT LCD.

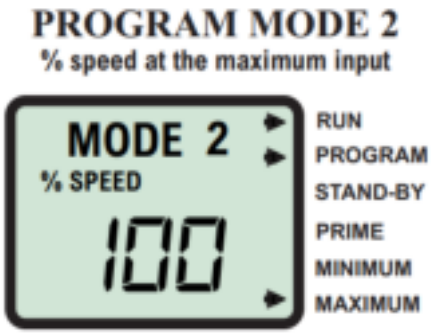


Enter the minimum mA input signal value. Note: this value must be less than the maximum mA input signal value.
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.

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 3-DIGIT LCD.

Enter the motor speed at the maximum mA input signal value.

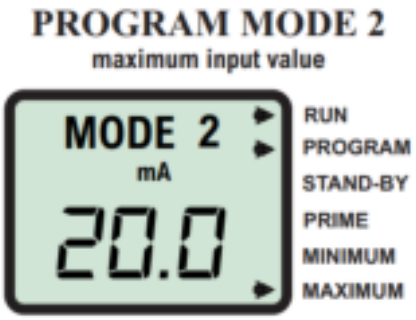
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.



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 3-DIGIT LCD.

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

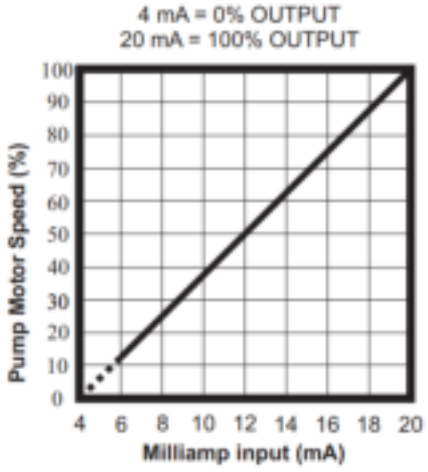
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.
- Press the mode button. Programming is complete.



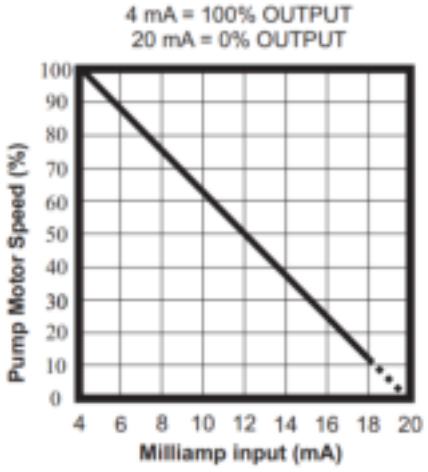
To exit the programming mode, press the RUN/STANDBY button and the MODE button at the same time. The PROGRAM arrow will disappear.

MODE 2 PROGRAMMING EXAMPLES

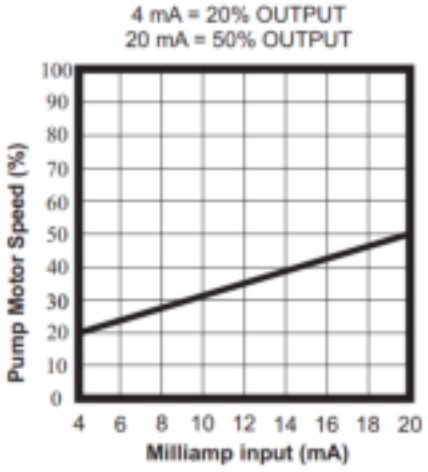
Example 1



Example 2



Example 3

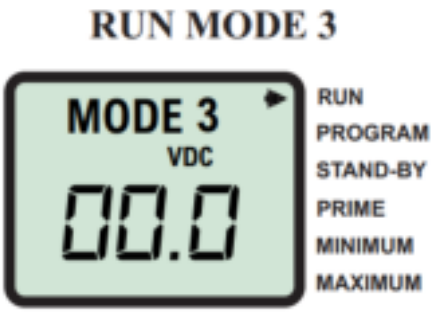


Note: Pump can be set from 0 - 100% motor speed in any input mode; however, actual working range of pump is from 10 - 100% motor speed, therefore motor may not start to rotate below 10% motor speed.

4.2.3 A100NV OPERATING MODE 3 - 0-10VDC input signal

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.
However, the programmed minimum VDC value must be less than the programmed maximum VDC value. The **ALARM and SERVICE** icons will blink if the programming is in error.

To assign the minimum and maximum motor speed and the minimum and maximum VDC input signal values:

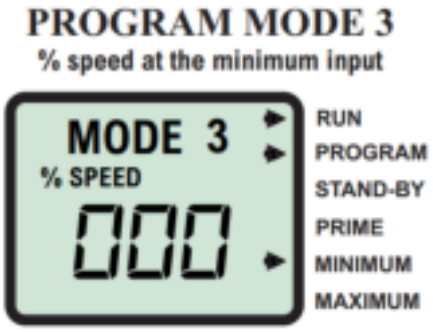


Set the pump for MODE 3. Press the MODE button until MODE 3 is shown on the LCD display. The % SPEED or VDC icon will light depending on the current display setting. The large 3-DIGIT LCD will indicate the current motor speed or the VDC input value.

Enter the programming mode. At the same time, press the RUN/STANDBY and MODE buttons. A **blinking ARROW** will point to the word PROGRAM indicating the program mode is activated. A blinking ARROW will point to the word MINIMUM indicating 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 value.

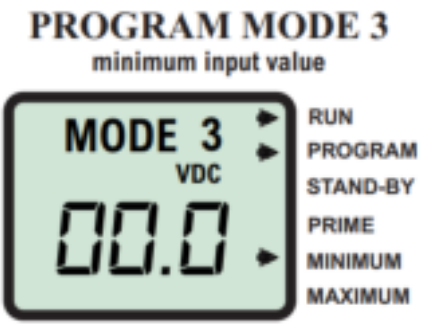
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.



Press the MODE button. The % SPEED icon will stop blinking and the VDC icon will blink indicating the minimum VDC value is ready to be programmed. The currently programmed minimum value is shown on the 3-DIGIT LCD.

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

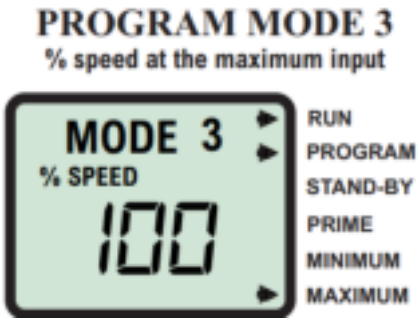
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.



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

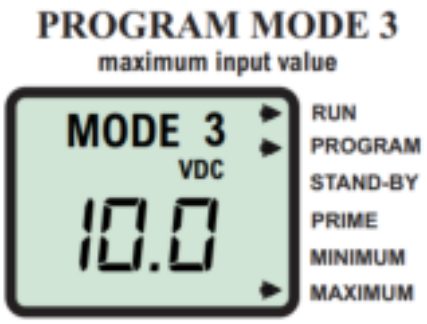
programmed. The currently programmed maximum motor speed value is shown on the 3-DIGIT LCD.

Enter the motor speed at the maximum VDC input signal value. Press the FIELD button to select the digit to program. The digit will blink when selected.
Press the DIGIT 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 3-DIGIT LCD.

Enter the maximum VDC input signal value. Note: this value must be greater than the minimum VDC input signal value.
Press the FIELD button to select the digit to program. The digit will blink when selected.
Press the DIGIT button to change the selected digit.
Repeat until all digits are programmed.
Press the mode button. Programming is complete.

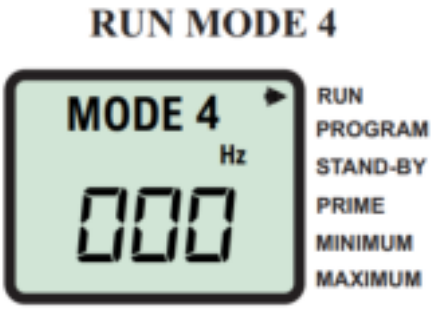


To exit the programming mode, press the RUN/STANDBY button and the MODE button at the same time. The PROGRAM arrow will disappear.

4.2.4 A100NV OPERATING MODE 4 - Frequency (Hz) input signal

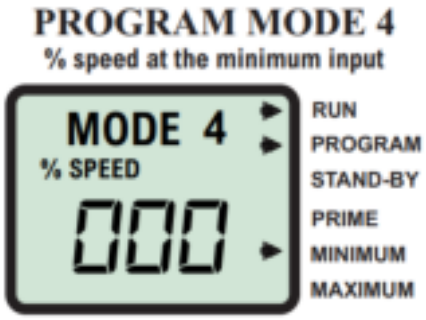
In this mode, the pump's motor speed is adjusted automatically based on the value of the frequency (Hz) of the input signal (500 Hz max.) Any motor speed can be assigned to either the minimum or maximum Hz input values.
However, the programmed minimum Hz value must be less than the programmed maximum Hz value. **The ALARM and SERVICE icons will blink if the programming is in error.**

To assign the minimum and maximum motor speed and the minimum and maximum Hz input signal values:



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. The large **3-DIGIT LCD** will indicate the **current motor speed or the current Hz input value.**

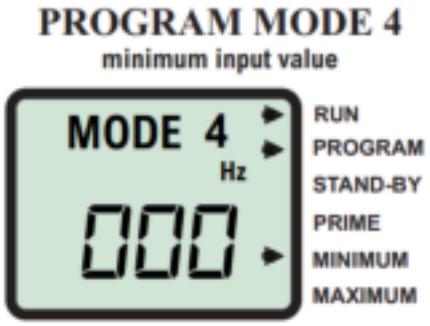
Enter the programming mode. At the same time, press the RUN/STANDBY and MODE buttons. A **blinking ARROW** will point to the word **PROGRAM** indicating the program mode is activated. A blinking ARROW will point to the word MINIMUM indicating the minimum value is ready to be programmed. The % SPEED icon 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 FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT 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 3-DIGIT LCD.

Enter the minimum Hz input signal value. Note: this value must be less than the maximum Hz input signal value.
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.

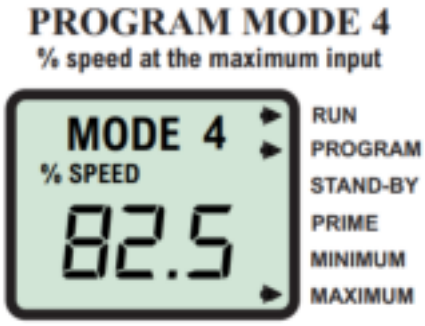


Press the MODE button. The Hz icon will stop blinking and the % SPEED icon will blink. The ARROW next to the word MAXIMUM will blink indicating the maximum value is ready to be programmed. The currently programmed maximum motor speed

value is shown on the 3-DIGIT LCD.

Enter the motor speed at the maximum Hz input signal value.

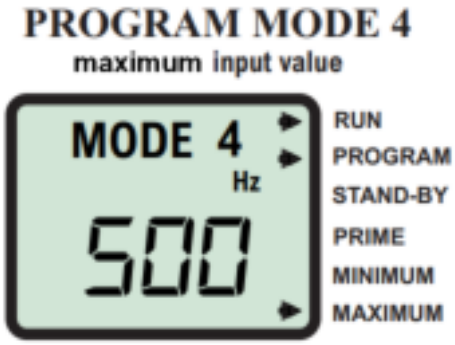
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.



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 3-DIGIT LCD.

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

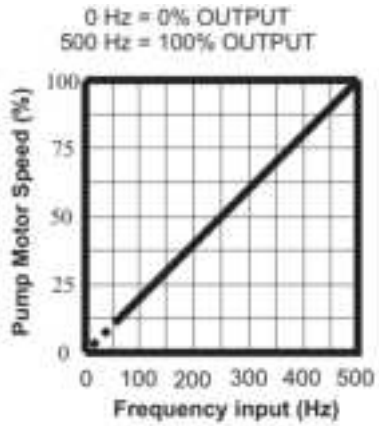
- Press the FIELD button to select the digit to program. The digit will blink when selected.
- Press the DIGIT button to change the selected digit.
- Repeat until all digits are programmed.
- Press the mode button. Programming is complete.



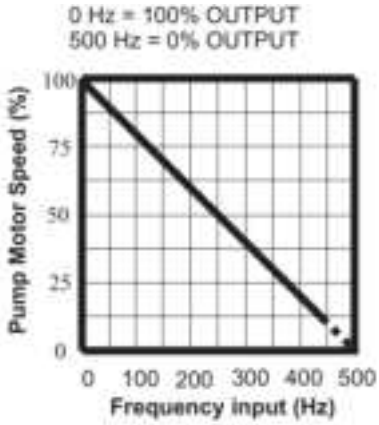
To exit the programming mode, press the RUN/STANDBY button and the MODE button at the same time. The PROGRAM arrow will disappear.

MODE 4 PROGRAMMING EXAMPLES

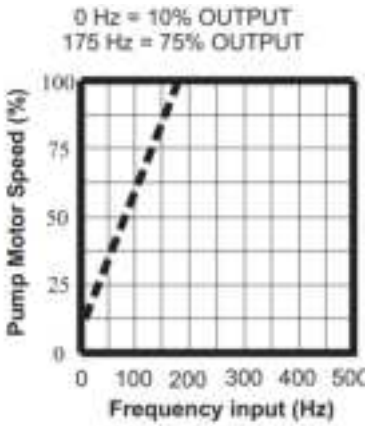
Example 1



Example 2



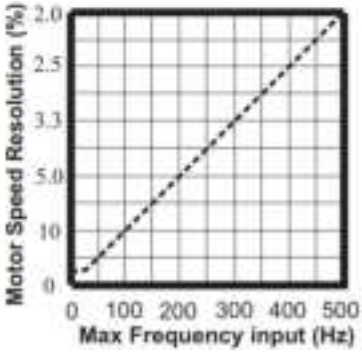
Example 3



MOTOR SPEED ADJUSTMENT RESOLUTION

$$\text{MOTOR SPEED RESOLUTION} = \frac{10}{\text{MAXIMUM INPUT FREQUENCY}}$$

NOTE: Max Hz > 25 Hz is recommended



4.3 TFD (Tube Failure Detection)

TFD (Tube Failure Detection) - The pump is equipped with a Tube Failure Detection System which is designed to stop the pump and provide an open collector (sinking) output signal in the event the pump tube should rupture and chemical enters the pump head.

This patented system is capable of detecting the presence of a large number of chemicals including Sodium Hypochlorite (Chlorine), Hydrochloric (muriatic) Acid, Sodium Hydroxide, and many others. The system will not be triggered by water (rain, condensation, etc.) or silicone oil (roller and tubing lubricant).

If the system has detected chemical, the pump tube must be replaced and the pump head and roller assembly must be thoroughly cleaned.

For "V" model pumps, press the RUN/STAND-BY and FIELD buttons at the same time (prime mode), to remove the pump tube. Thoroughly clean the pump head and roller assembly. Press the RUN/STAND-BY button to reset the system. Press Run/Standby button to reset the alarm after cleaning the pump head and replacing the tube.

Confirm Chemical Detection - To determine if your chemical will be detected by the system, remove the pump tube and roller assembly. Place a small amount of the chemical in the bottom of the pump head - just enough to cover the sensors. Turn on the pump. If the TFD system detects the chemical, the pump will stop after a five second confirmation period. "V" model pumps will display the ALARM icon.

If the TFD system does not detect the chemical, the pump will continue to run after the confirmation period. Carefully clean the chemical out of the pump head being sure to remove all traces of chemical from the sensor probes. Turn the power switch off and on to reset the pump.

Contact Closure Alarm Output - "V" model- A contact closure output (relay) is provided with the TFD 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.

Open Collector Alarm Output - "F" model - An open collector (sinking) output signal is provided with the TFD system. (See circuit board connections for wiring instructions.

Disabling the TFD

If desired, the TFD can be disabled. To disable the TFD, the pump electronics enclosure must be opened and the two connecting the TFD pins to the circuit board must be disconnected from the circuit board. These wires and gray. Refer to Installation pages on location of TFD terminal block.

(FVS) Flow Verification System - The pump is equipped with a Flow Verification System which is designed to stop the pump in the event the sensor does not detect chemical during pump operation. This could indicate a clogged injection fitting, empty chemical solution tank, worn pump tube, loose tubing connection, etc.

The system features an alarm delay time of 6 seconds which allows the pump to clear any gases that may have accumulated during stopped operation. The pump will stop, and the alarm mode activated, if no pulses are received by the pump and the alarm delay time period has ended. Turn the power

4.4 FVS - Flow Verification System

switch off and on to clear the alarm and restart the pump. The Flow Verification Sensor is sold as an optional accessory

The “V” model allows the use to program an alarm delay time value from 1-256 seconds must be programmed. Press the FIELD and DIGIT buttons at the same time to enter the delay value. Note: an alarm delay value of 000 disables the FVS system. Any other value (001-256) activates the FVS. Press the STAND-BY button twice to clear the alarm and restart the pump.

Sensor Model Number	Operating Flow Range (mL/Min)
FV-101	30 - 300
FV-201	100 - 1000
FV-301	200 - 2000
FV-401	300 - 3000
FV-501	500 - 5000
FV-601	7000 - 7000
MS61	10 - 5000
MS62	100 - 10000

Confirm the FVS flow range - The Flow Verification Sensor (FVS) will only function within its operating range. Sensor model FV-101 has an operating range of 30-300 ml/min (1-10 oz/min). If the pump’s output is less than 30 ml/min (0.5 ml/sec), the sensor will not detect chemical and a signal will not be sent to the pump.

Install the FVS Flow Sensor - The Flow Verification Sensor (FV models) should be installed on the inlet (suction) side of the pump tube. The sensor includes a PVC tubing insert, located inside the sensor’s female thread connection, the sensor onto the pump tube until the tubing insert is snug against the pump tube inlet fitting - do not over-tighten.

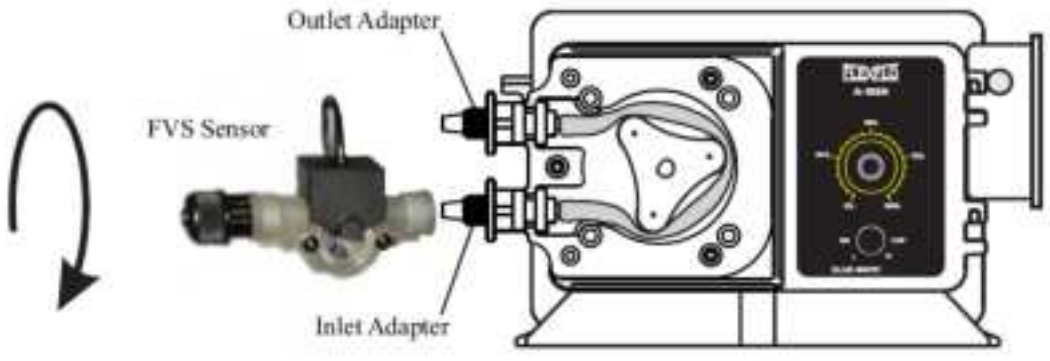
Connect the red/white (+), black (-), and bare (signal) wires from the sensor to the red (+), black (-), and yellow (signal) wires on the plug connector.

Knock-out the liquid-tite connector mounting hole on the side of the pump enclosure and install the liquid tight connector. Route the wires through the connector and tighten the connector nut. Plug the connector onto the circuit board at the pins marked “FVS”.

If using am MS6 model flow meter/sensor, reference the operating manual for that unit to determine the best wiring method.

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.

Open Collector Alarm Output - An open collector (sinking) output signal is provided with the FVS system. (See wiring diagrams).



5.0 Operation

Once the pump has been installed and wired properly, it can be put into operation. Be sure you are familiar with all control features before using the pump.

5.1 Operating the A-100NF

Priming the Pump

Before priming the pump, or starting the pump, be sure that all suction and discharge lines are connected properly and that proper valves are open.

The pump can be primed by turning the Power Switch to “ON”, and then running the pump at 100% speed. The pump can be stopped at any time by turning the power switch to “OFF”.

If the pump does not prime, check the suction line for clogs, obstructions, or leaks. Make sure all appropriate valves are open.

Manual Operation

To run the pump, simply switch the pump to “ON” and adjust the speed as desired using the control dial knob. The A-100NF has a variable speed motor capable of adjusting the speed between 10% and 100% speed (certain models may be adjusted only between 15% and 100%.) The flow will be near-continuous. To stop the pump, press the power switch to “OFF”.

The pump can only be turned on/off remotely by turning incoming power off and on, while the power switch remains in the “ON” position.

Calibration

To ensure the most accurate pumping, a pump calibration is recommended prior to operating the pump. The A-100NF pump flow rate will vary depending on the suction line conditions. Calibrate the pump with actual suction line conditions.

5.2 Operating the A-100NV

Priming the Pump

Before priming the pump, or starting the pump, be sure that all suction and discharge lines are connected properly and that proper valves are open.

Pressing the Run/Standby and Field buttons at the same time will start the pump at 100% speed and will run for 99 seconds. The pump can be stopped at any time by pressing the Run/Standby button. All 99 seconds may not be required to prime the pump. Conversely, if additional priming is necessary, the process can be repeated.

If the pump does not prime, check the suction line for clogs, obstructions, or leaks. Make sure all appropriate valves are open.

Manual Operation – Mode 1

To run the pump in Manual Mode, ensure the “MODE 1” is displayed. Or toggle Mode button until “MODE 1” is displayed. Press the Run/Standby key to start the pump running. Adjust pump speed by programming (see Set-Up and Controls section). To stop the pump, press the Run/Standby key.

4-20ma Input Speed Control - Mode 2

To run the pump in 4-20mA Mode, press the Mode button until “MODE 2” is displayed. Press the Run/Standby button to start the pump. Pump speed will be set by remote 4-20mA input signal. To toggle/view either % motor speed or 4-20 mA signal, press the Digit and Mode keys at the same time. To stop the pump, press the Start/Stop key.

0-10 VDC Input Speed Control - Mode 3

To run the pump in O-10 VDC Mode, press the Mode button until “MODE 3” is displayed. Press the Run/Standby button to start the pump. Pump speed will be set by remote 0-10 VDC input signal. To toggle/view either % motor speed or 0-10 VDC signal, press the Digit and Mode keys at the same time. To stop the pump, press the Start/Stop key.

Frequency (Hz) Input Speed Control - Mode 4

To run the pump in Frequency Mode, press the Mode button until “MODE 4” is displayed. Press the Run/Standby button to start the pump. Pump speed will be set by remote Hz input signal. To toggle/view either % motor speed or Hz signal, press the Digit and Mode keys at the same time. To stop the pump, press the Start/Stop key.

5.3 Calibration

To ensure the most accurate pumping, a pump calibration is recommended prior to operating the pump. The A-100NV pump flow rate will vary depending on the suction line conditions and solution viscosity. Calibrate the pump with actual suction line conditions.

To calibrate the pump:

1. Connection tubing and open valves on the suction side of the pump to represent actual suction lines conditions
2. Set up discharge and open discharge valves to dispense into calibration column/cylinder.
3. Prime to the pump so that the calibration cylinder begins to fill. Stop the pump and note the solution level in the calibration column.
4. Run the pump at a set speed for 1 minute.
5. Record the flow difference in the calibration cylinder.
6. Calculate the flow rate by dividing the flow by the time. For example, if the pump runs for 1 minute, and the flow difference is 30 ml, then divide 30ml by 1 minute. The flow rate is 30 ml/min.
7. For best accuracy, run more than one calibration to check results, or run another calibration at a different pump speed.

Calibration results should be similar to the flow rating for the pump tube, but can vary depending on chemical composition, suction lift, viscosity, temperature, elevation, and other conditions.

6.0 Maintenance

6.1 Routine Inspection and Maintenance

The pump requires very little maintenance. However, the 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 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.

500 Hour Service Warning Timer
The A-100NV is equipped with a tube life warning timer. After approximately 500 hours of accumulated running time, the SERVICE icon will light. This is a reminder that the pump tube is nearing its minimum life expectancy and should be replaced. Your actual tube life will depend on many factors such as the chemical used, back pressure, temperature, viscosity, and motor RPM.

To Reset Warning Timer - Press Run/Standby and Digit buttons at the same time.

6.2 How to Clean and lubricate the Pump

The pump will require occasional cleaning and lubricating. The amount will depend on the severity of service.

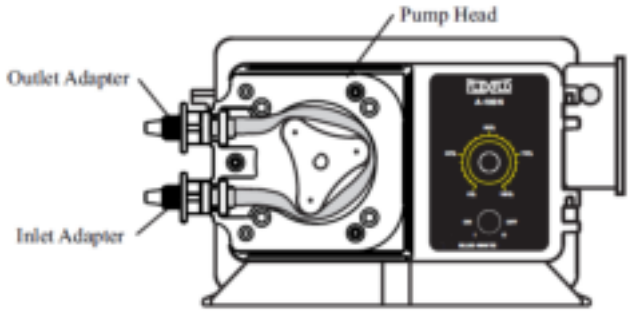
- When changing the pump tube assembly, the pump head chamber, roller assembly and pump head cover should be wiped free of any dirt and debris.
- The pump head cover bearing may require grease periodically. Apply a small amount of grease (Aeroshell aviation grease #5 or equivalent) when necessary.
- 100% silicone lubricant should be applied to the roller assembly for proper maintenance.
- 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 compartment and on the rear panel. Clean if necessary.

6.3 How to Replace the Pump Tube

The pump tube assembly will eventually break if not replaced. The tube has been designed for a minimum service life of 500 hours. However, the life of the tube is affected by many factors such as the type of chemical being pumped, the amount of back pressure, the motor RPM, temperature and others. The pump tube assembly must be inspected and replaced regularly.

Remove the Old Pump Tube - The pump roller assembly spins in a counter clockwise direction. The pump head inlet (suction) side is located at the bottom of the pump and the outlet (discharge) is located at the top of the pump head.

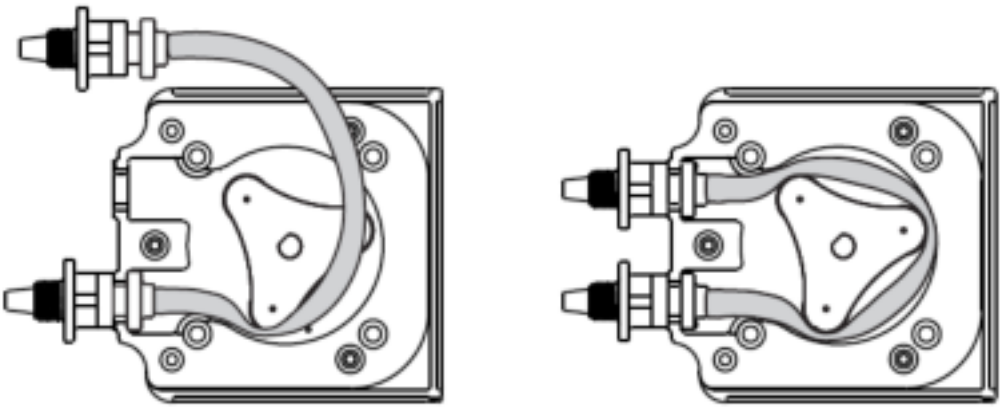
- Release any pressure that may be in the discharge tubing.
- Disconnect the suction and discharge tubes from the pump tube.
- Remove the pump head cover.
- With the pump running, pull the inlet fitting out of the pump-head. Guide the tube counter clockwise away from the rollers. Pull the outlet fitting out of the pump head.



Install the New Pump Tube - Be sure the pump head chamber is clean and free of any debris.

- Remove and inspect the roller assembly. Be sure the rollers spin freely. If required, apply a small amount of grease to the pump head cover bearing. (Do not apply petroleum-based grease to roller or tubing. Only use pure silicon oil on rollers and tubes.)
- With the pump running, insert the inlet (suction) side of the Pump Tube fitting into the pump head.
- Carefully guide the Pump Tube into the pump head. Stretch the tube slightly and insert the outlet (discharge) fitting into the upper retaining slot in the pump head.
- Place the clear cover on the pump head and secure with three screws.

Tip! Apply pure silicone oil lubrication to roller axle and outside of tube for longer tube life. Order silicon oil bottle A-050 at the Blue-White store.



6.4 Tube Care and Use Guide

Peristaltic Tube Assembly Care and Use Guide

- **Blue-White® Tube Assemblies are specifically designed, tested, and intended for use only in Blue-White® peristaltic pumps.** Users assume the risk of using Blue-White® Tube Assemblies for any other purpose.

- **Blue-White® peristaltic metering pumps are designed to operate with Tube Assemblies manufactured by Blue-White® only.** Use of tubing not manufactured by Blue-White® will affect the pump's performance, may damage the pump, and will void the warranty.

- Blue-White® Tube Assemblies are designed to function in a specific pump model. Verify that the Tube Assembly used is compatible with the pump before installing.

- There are a variety of Blue-White® Tube Assembly options available for each peristaltic pump. **Verify that the Tube Assembly selected is suitable for the application before use.** It is possible the Tube Assembly provided with the pump may not be the best option for your specific application. Review your application before using the pump. Any change in chemical, flow, pressure, duty, or piping will require re-evaluating the Tube Assembly's fit for purpose.

- We recommend keeping spare Tube Assemblies on site, as the Tube Assemblies are wearable parts and will need periodic replacement. Keep all spare Tube Assemblies in the original packaging and store them in a clean, dry, and temperature-controlled environment out of direct sunlight. Flex-A-Prene® and Flex-A-Chem® Tube Assemblies have a shelf life of 3 years. Flex-A-Thane® Tube Assemblies have a shelf life of 1 year.

- Tube Assembly life is highly dependent on pump speed, pressure, and duty. Tube Assemblies may last only a few days/weeks, or can last longer than a year in a specific application. However, Tube Assemblies should be replaced at least once a year. An estimate of Tube Assembly life for a specific application can be provided by contacting the Blue-White® factory.

- Contact the Blue-White® factory immediately if you are unsure about the use and operation of any Tube Assemblies.

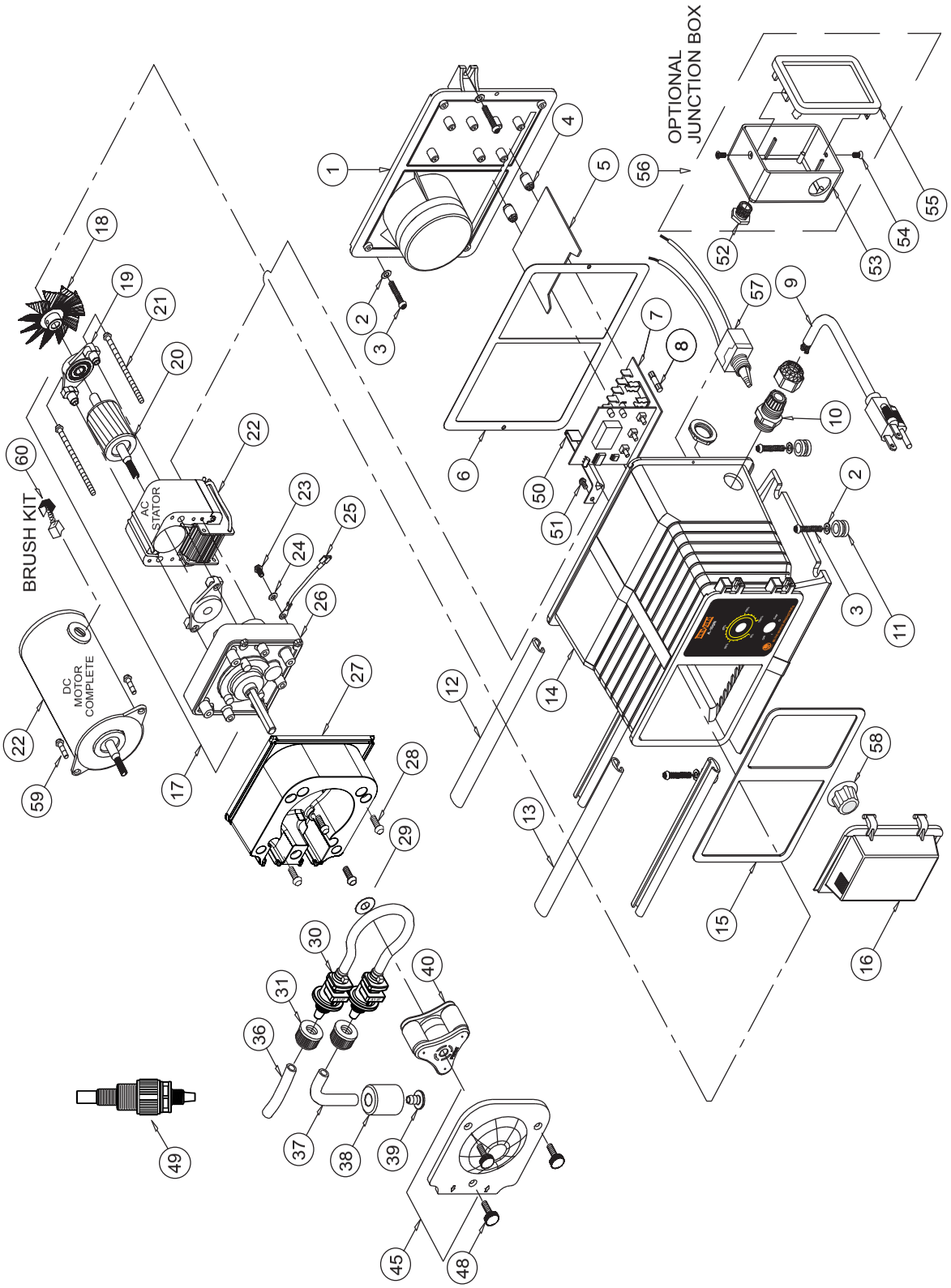
6.5 Tube & Roller Use Log

Pump Name/Model:

Tube/Roller Part Number	Qty Purchased / Used	Reason	Date

7.0 Parts and Accessories

7.1 Replacement Parts Drawing A-100NF

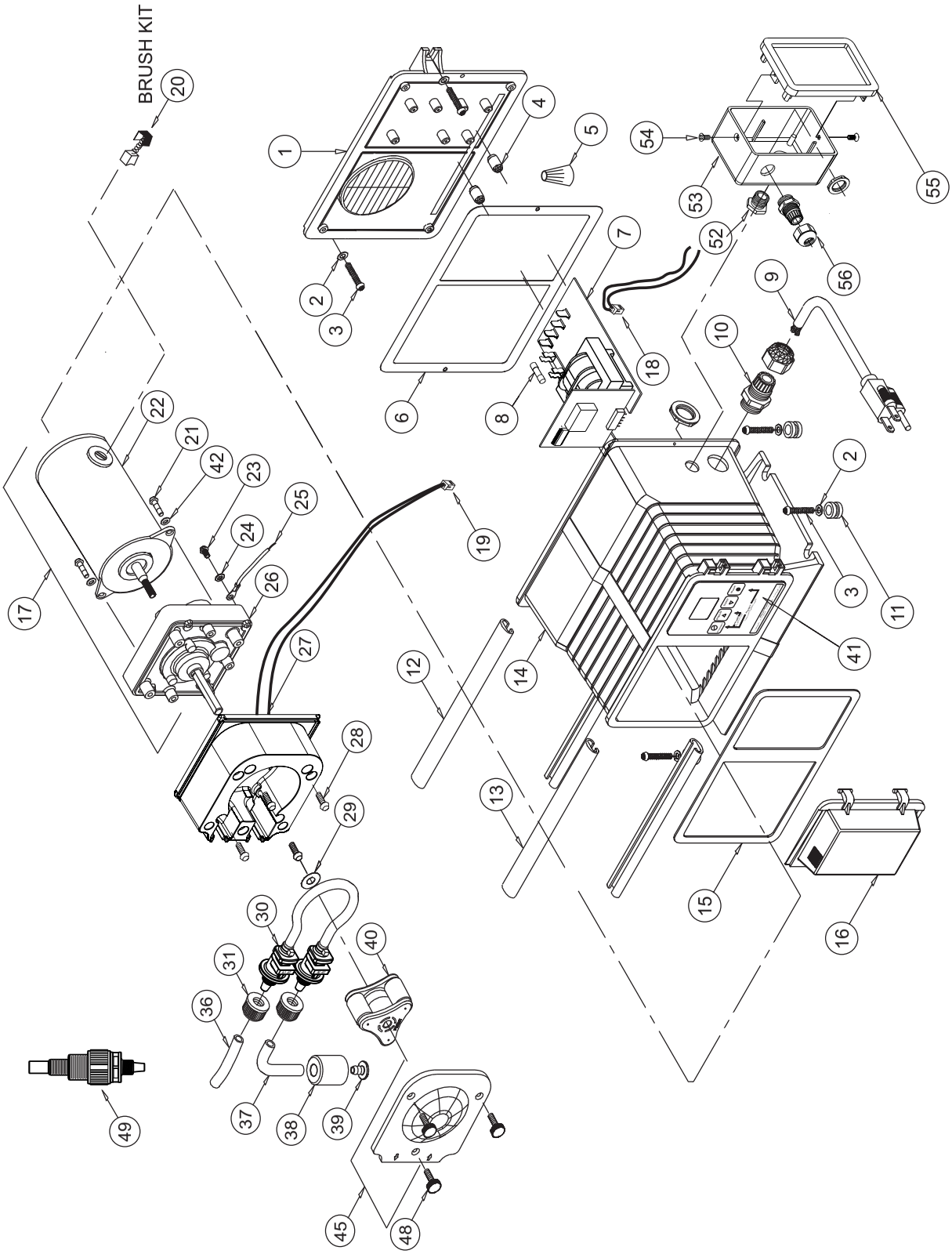


7.2 Parts List and Accessories A-100NF

Item	Part No.	Product Name	Qty. Req.
1	71000-214	Enclosure Back With Gasket,	1
2	90011-094	Washer, #10 Stainless	2
3	90011-091	Screw, #10 X 1.0” Phillips Steel	4
6	90006-580	Gasket, Back Plate, Neoprene	1
7	C-1817N-1	Speed Cntrl, A-100NF, 115V60	1
	C-1817N-4	Speed Cntrl, A-100NF, 220V50	1
	C-1817N-5	Speed Cntrl, A-100NF, 230V60	1
N/S	90010-036	Wire Nut, Blue	4
N/S	90010-037	Wire Nut, Orange	1
N/S	76001-030	Lead Wire, Blu/white, 115v	1
N/S	76001-031	Lead Wire, Red/white, 230v	1
N/S	76001-032	Lead Wire, Brn/white, 220v	1
N/S	76001-033	Lead Wire, Yellow, 220v	1
N/S	76001-034	Lead Wire, Black, 115v	1
9	90010-110	Power Cord, 115v60hz,	1
	90010-196	Power Cord, 220v50hz,	1
	90010-133	Power Cord, 230v60hz,	1
10	A-033N	Cord Inlet Bushing	1
11	90003-559	Mounting Feet, Rubber	4
12	76001-000	Slide Clamp, Enclosure Rear	1
13	76000-999	Slide Clamp, Enclosure Front	1
14	71000-187	Enclosure Model F w/cord	1
15	90006-579	Gasket, Enclosure Front, Neoprene	1
16	90002-191	Door, Electronic Controls Cover	1
17	70002-241	G/motor, V/S 14Rpm, 90VDC	1
	70002-242	G/motor, V/S 30Rpm, 90VDC	1
	70002-243	G/motor, V/S 45Rpm, 90VDC	1
	70002-244	G/motor, V/S 60Rpm, 90VDC	1
22	90010-242	Motor, 90V DC, model “F”	1
24	90011-078	Washer, Ground Screw, #8 Star	1
25	90010-126	Wire, ground, Green	1
26	A-008-1	Gearbox, 14 Rpm	1
	A-008-2	Gearbox, 30 Rpm	1
	A-008-3	Gearbox, 45 Rpm	1
	A-008-4	Gearbox, 60 Rpm	1
27	76001-009	Pumphead, no TFD sensors	1
	71000-488	Pumphead, w/TFD sensors	1

Item	Part No.	Product Name	Qty. Req.
28	C-324N Screw	P/head, 10-32 X .50	4
29	A-031	Spacer, Rotor	1
30	A1-4T	Tube, A-100N S/A -4T Flex-A-Prene	1
	A1-6T	Tube, A-100N S/A -6T Flex-A-Prene	1
	A1-7T	Tube, A-100N S/A -7T Flex-A-Prene	1
	A1-8T	Tube, A-100N S/A -8T Flex-A-Chem	1
	A1-1T	Tube, A-100N S/A -1T Flex-A-Thane	1
	A1-2T	Tube, A-100N S/A -2T Flex-A-Thane	1
	A1-3T	Tube, A-100N S/A -3T Flex-A-Thane	1
	A-050	Silicon Oil, 5 ml bottle	1
31	C-330-6	Nut, Tube, .37 O.D. Tubing	1
36	C-335-6	Tubing, Outlet, .37 O.D. X 5ft, Poly	1
37	C-334-6	Tubing, Inlet, .37 O.D. X 5ft, PVC	1
38	C-346	Weight, Inlet Tubing, Ceramic	1
39	C-342-6	Strainer, Inlet Tube, Polypro	1
40	71000-159	Roller, (use with -4, -6 tubes)	1
	71000-255	Roller, (use with -8 tube)	1
	71000-350	Roller, (use with -1, -2, -3, -7 tubes)	1
45	A1-SXX-C	Cover, P/head With Bearing	1
48	90011-160	Screw, P/head Cover, 8-32 X .62	3
49	A-014N-6A	Inj Valve, .5-.25 Mpt X .37 O.D.	1
50	90006-583	Motor Clip, 14, 30RPM	1
	90006-601	Motor Clip, 45, 60RPM	1
51	90011-146	Screw, Motor Clip, 8-32 X .25	1
52	90007-515	Bushing, J-Box Connector, Alum.	1
53	76001-029	Junction Box, Valox	1
54	90011-129	Screw, 6-32 X .25 S Black	2
55	71000-133	Cover, J-Box w/Gasket & Label	1
56	70000-656	J-Box Assembly, Complete	1
N/S	90008-151	J-box Hole Plug .75 Dia Blk	1
57	A-022	Power Switch	1
N/S	A-030	Push button prime switch	1
58	A-032N	Knob, adjustment	1
59	90011-023	Screw, Motor, 8-32 x .50 Phill	2
60	C-1814N-2	Motor brush set, 90VDC motor	1

7.3 Replacement Parts Drawing A-100NV



7.4 Parts List and Accessories A-100NV

Item	Part No.	Product Name	Qty. Req.
1	71000-489	Enclosure Back Plate With Gasket, Valox	1
2	90011-094	Washer, Mounting, #10 Stainless	2
3	90011-091	Mounting Screw, #10 X 1.0" Phillips Steel	4
4	76001-001	Tubing Spacer A-100N digital	2
5	90010-036	Wire Nut, Blue	1
6	90006-580	Gasket, Enclosure Back Plate	1
7	A-023N-V-115	Circuit board A-100NV 115V	1
	A-023N-V-230	Circuit board A-100NV 220V/230V	1
8	90010-235	Fuse, A-100NV Circuit Board, 1A 250VAC	1
9	71000-175	Power Cord, 115v60hz, Digital Models	1
	71000-176	Power Cord, 220v50hz, Digital Models	1
	71000-177	Power Cord, 230v60hz, Digital Models	1
10	70000-589	Cord Inlet Bushing	1
11	90003-559	Mounting Feet, Rubber	4
12	76001-000	Slide Clamp, Enclosure Rear	1
13	76000-999	Slide Clamp, Enclosure Front	1
14	71000-494	Enclosure A-100NV w/jbox	1
15	90006-579	Gasket, Enclosure Front	1
16	90002-191	Door, Electronic Controls Cover	1
17	70002-250	Gearmotor, 14 Rpm, 24V DC	1
	70002-251	Gearmotor, 30 Rpm, 24V DC	1
	70002-252	Gearmotor, 45 Rpm, 24V DC	1
	70002-253	Gearmotor, 60 Rpm, 24V DC	1
18	90010-246	Wire set w/plug, Alarm relay	1
19	90010-245	Wire set w/plug, TFD sensor	1
N/S	90010-247	Wire set w/plug, input signals	1
20	C-1814N-4	Motor Brush kit (2 ea), 24V DC	1
21	90011-023	Screw, Motor, 8-32 x .50	2
22	90010-244	Motor, 24V DC	1
23	90011-024	Screw, Green Ground, 8-32 x .25	1
24	90011-078	Washer, Ground Screw, #8 Star	1
25	90010-222	Wire, Motor ground, Digital Timers, Green	1

Item	Part No.	Product Name	Qty. Req.
26	A-008-1	Gearbox, 14 Rpm	1
	A-008-2	Gearbox, 30 Rpm	1
	A-008-3	Gearbox, 45 Rpm	1
	A-008-4	Gearbox, 60 Rpm	1
	A-008-5	Gearbox, 125 Rpm	1
27	71000-488	Pumphead, A-100N w/TFD sensors	1
28	C-324N	Screw, Pumphead, 10-32 X .50 Phil Pan Black	4
29	A-031	Spacer, Rotor	1
30	A1-4T	Tube, A-100N S/A -4T Flex-A-Prene®	1
	A1-6T	Tube, A-100N S/A -6T Flex-A-Prene®	1
	A1-7T	Tube, A-100N S/A -7T Flex-A-Prene®	1
	A1-8T	Tube, A-100N S/A -8T Flex-A-Chem®	1
	A1-1T	Tube, A-100N S/A -1T Flex-A-Thane®	1
	A1-2T	Tube, A-100N S/A -2T Flex-A-Thane®	1
	A1-3T	Tube, A-100N S/A -3T Flex-A-Thane®	1
31	C-330-6	Nut, Tube Compression Type, .37 O.D. Tubing	2
36	C-335-6	Tubing, Outlet, .37 O.D. X 5ft, Polyethylene	1
37	C-334-6	Tubing, Inlet, .37 O.D. X 5ft, Clear PVC	1
38	C-346	Weight, Inlet Tubing, Ceramic	1
39	C-342-6	Strainer, Inlet Tube, Polypropylene	1
40	71000-159	Roller Assembly -4, -6 tubes	1
	71000-350	Roller Assembly -1, -2, -3, -7 tubes	1
41	90012-245	Label, A-100NV front panel controls	1
42	90011-074	Washer, #8 splitlock	2
45	A1-SXX-C	Cover, Pumphead With Sleeve Bearing	1
48	90011-160	Screw, Pumphead Cover, 8-32 X .62 Cap	3
49	A-014N-6A	InjValve Assy, .5-.25 MPT X .37 OD Tube	
52	90007-515	Bushing, Junction Box Connector, Alum.	1
53	76001-254	Junction Box A-100NV	1
54	90011-129	Screw, Cover, 6-32 X .25 Phil Pan SS Black	2
55	71000-133	Cover, Junction Box with Gasket and Label	1
56	90008-199	Connector Liquid-tight	1

8.0 Troubleshooting

Common Issues

Air is entering the pump. Check suction lines to make sure all connections are tight. Check the level of the chemical tank. Remove obstructions and clean strainers.

Pump is not accurate. Check the suction line and clean the strainer. Check for obstructions in suction lines, discharge lines, and injectors. Check the condition of the tube and roller. Ensure the roller is the correct match for the tube. (See Spare Parts)

The pump will not run and/or shows “Alarm”. Check to make sure the pump is in the proper operating Mode. Press the “Mode” key until the proper Mode is activated.

Check if the TFD (leak detection) has detected a solution/chemical in the pump head. Or the Flow Verification System “FVS” has been activated. If the tube has leaked, it must be replaced, and the pump head cleaned before re-starting. Turn power on/off to reset the TFD or FVS for A-100NF.

For A-100NV, check to see if the pump display shows “Alarm”. “Alarm” will indicate that the TFD (leak detection) has detected a solution/chemical in the pump head. Or the Flow Verification System “FVS” has been activated. If the tube has leaked, it must be replaced, and the pump head cleaned before re-starting. Press the Run/Standby key twice to clear “Alarm”. If the “FVS’ has triggered the Alarm, but no FVS Sensor is connected to the pump, de-activate the “FVS” by pressing “Field” and “Digit” keys at the same time, and then set delay to “000”.

“Service” is displayed on the screen. The “Service” display indicates that the pump has run for 500 hours since the last tube change, or since the last “Reset Service.” Depending on your pump usage and expected tube life, either replace the tube and reset “Service”, or reset “Service” to add 500 hours until next “Service” notice.

“Alarm” and “Service” are blinking. Programming error has occurred. Check that programming values are within limits.

Electrical

The pump will not power up. Check power source or try a different power source. Check to ensure the power cable is properly wired.

The input signal (4-20mA, 0-10V, Pulse) is dropping or incorrect. Check wiring integrity and proper connection to pump. Ensure signal is powered via 15-24VDC. Check that all signal cables are shielded and properly grounded. Ensure signal wiring is not located or run next to high voltage power or equipment generating EMI. Ensure power wiring to the pump is clean/conditioned.

9.0 System

About the A-100N Pump

The A-100N Pump is designed to be simple and easy to operate. The pump comes pre-tested and is ready to use.

There are some features that may require opening the pump and accessing the main circuit board (Pulse frequency jumper, NO/NC relay). Take care when accessing internal components. If unsure about this process, please contact the factory for assistance.

The A-100N pump does not require firmware updates.

Repairs and Updates

If the A-100N requires service or internal replacement parts, contact the factory for assistance. Most parts are user-replaceable, but the pump may also be sent to the factory or a local service center for evaluation.

10.0 Warranty

LIMITED WARRANTY
Your Blue-White product is a quality product and is warranted for a specific time from date of purchase (proof of purchase is required). The product will be repaired or replaced at our discretion. 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 product manual. Warranty status is determined by the product's serial label and the sales invoice or receipt. The serial label must be on the product and legible. The warranty status of the product will be verified by Blue-White or a factory authorized service center.

FLEXFLO® A-100N Pumps are warranted for 1 year from date of purchase (proof of purchase is required). Pumps will be repaired or replaced at our discretion.

WHAT IS NOT COVERED

- FLEXFLO® Pump Tube Assemblies 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 service center.
- Products that have been tampered with, or in pieces.
- Damage resulting from misuse, carelessness such as chemical spills on the enclosure, abuse, lack of maintenance, or alteration which is out of our control.
- Damage by faulty wiring, power surges or acts of nature.

BLUE-WHITE 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 or a factory authorized service center.

PROCEDURE FOR IN WARRANTY REPAIR
Warranty service must be performed by the factory or an authorized service center. Contact the factory or local repair center to obtain a RMA (Return Material Authorization) number. It is recommended to include foot strainer and injection/check valve fitting since these devices may be clogged and part of the problem. Decontaminate, dry, and carefully pack the product to be repaired. Please enclose a brief description of the problem and proof of purchase. Prepay all shipping and insurance cost. COD shipments will not be accepted. Damage caused by improper packaging is the responsibility of the sender. When In-Warranty repair is completed, the factory pays for return shipping to the dealer or customer.

PRODUCT USE WARNING
Blue-White products are manufactured to meet the highest quality standards in the industry. Each product instruction manual includes a description of the associated product warranty and provides the user with important safety information. Purchasers, installers, and operators of Blue-White products should take the time to inform themselves about the safe operation of these products. In addition, Customers are expected to do their own due diligence regarding which products and materials are best suited for their intended applications. BLUE-WHITE is pleased to assist in this effort but does not guarantee the suitability of any particular product for any specific application as Blue-White does not have the same degree of familiarity with the application that the customer/end user has. While BLUE-WHITE will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

BLUE-WHITE SHALL NOT BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE WHETHER DIRECT, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF OR RELATED TO THE FAILURE OF ANY OF ITS PARTS OR PRODUCTS OR OF THEIR NONSUITABILITY FOR A GIVEN PURPOSE OR APPLICATION.

CHEMICAL RESISTANCE WARNING
BLUE-WHITE offers a wide variety of wetted parts. Purchasers, installers, and operators of Blue-White products must be well informed and aware of the precautions to be taken when injecting or measuring various chemicals, especially those considered to be irritants, contaminants or hazardous. Customers are expected to do their own due diligence regarding which products and materials are best suited for their applications, particularly as it may relate to the potential effects of certain chemicals on Blue-White products and the potential for adverse chemical interactions. Blue-White tests its products with water only. The chemical resistance information included in this instruction manual was supplied to BLUE-WHITE by reputable sources, but Blue-White is not able to vouch for the accuracy or completeness thereof. While BLUE-WHITE will honor all of its product warranties according to their terms and conditions, Blue-White shall only be obligated to repair or replace its defective parts or products in accordance with the associated product warranties.

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

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.

AUTHORIZED SERVICE CENTERS

To find an authorized service center near you, please call Blue-White Industries at (714) 893-8529 or e-mail us at customerservice@blue-white.com

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Blue-White®

Fluid metering solutions made simple

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

P.N. 80000-381 A-100N (F.V) Pump REV 21 202507023

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