













SERIES A2P

Operating Manual

Protected by Patents: 8,418,364; 8,215,931; 7,001,153; 7,284,964; 4,496,295 and other patents pending

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PLEASE READ ENTIRE INSTRUCTION MANUAL PRIOR TO INSTALLATION AND USE.

1.0 Introduction

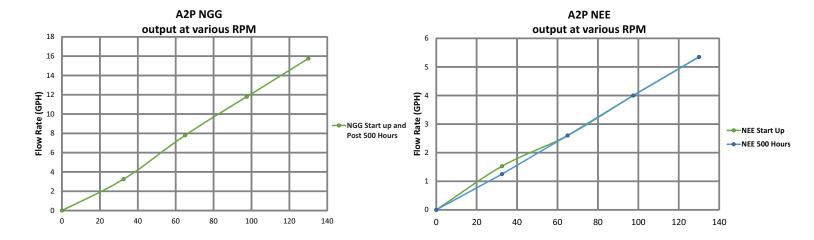
Congratulations on purchasing Flex-Pro A2P variable speed Peristaltic Metering Pump. A peristaltic pump is a type of positive displacement pump used for pumping a variety of fluids.

Your Flex-Pro pump is pre-configured for tubing that shipped with your metering pump. Tubing assembly has an Identification number printed on tube for easy re-order; such as NEE, NGG, etc.

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

1.1 Available Models

	Feed Ra	te	Max Speed	Max Pressure	Max Temperature	A2P Model Numbers		
Flex-A-Prene® A2P Tube Pumps Meets FDA criteria for food Excellent chemical resistance CIP SIP								
GPH	LPH	ML/Min	RPM	PSI (bar)	F (C)	115V AC	230V AC	220V AC
		3.47 - 347 10.03 - 1003 compressions typ	130 130 e connection	50 (3.4) 40 (2.8)	185 (85) 185 (85)	A2P24-*NEE A2P24-*NGG		A2P26-*NEE A2P26-*NGG



ATTENTION: It is recommended that pump be allowed a one hour break-in period before calibrating new tube.

Optional Extended Brackets

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

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

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



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2.0 **Specifications**

Maximum working pressure:

50 psig (3.4 bar)

Note: see individual pump tube assembly maximum pressure ratings.

Maximum suction lift:

30 ft. of water at sea level (14.7 atm psi)

Ambient Operating Temperature

14°F to 125°F (-10°C to 52°C)

Ambient Storage Temperature

-40°F to 158°F (-40°C to 70°C)

Operating Voltage:

115VAC/50/60Hz, 1ph (1.5 Amp Maximum) 230VAC/50/60Hz, 1ph (0.7 Amp Maximum) 220VAC/50/60Hz, 1ph (1.0 Amp Maximum) 240VAC/50/60Hz, 1ph (1.0 Amp Maximum)

Power Cord Options:

115V50/60Hz = NEMA 5/15 (USA) 230V50/60Hz = NEMA 6/15 (USA) 220V50/60Hz = CEE 7/VII (EU)

240V50/60Hz = AS 3112 (Australia/New Zealand)

Motor:

Brushed DC, 1/8 H.P.

Duty cycle:

Continuous

Motor speed adjustment range 100:1:

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

Enclosure:

NEMA 4X (Ip66), Polyester powder coated aluminum. Maximum Overall Dimensions: 7-1/2" W x 10-1/4" H x 14" D (19 W x 26 H x 35.6 D cm)

Product weight:

28.4 lb. (12.9 Kg)

Approximate shipping wt:

35 lb. (15.9 Kg)

2.1 Materials of construction

Wetted components:

Pump Tube Assembly (Model Specific - 2 provided):

Tubing: Flex-A-Prene Adapter fittings: .PVDF

Injection / Back-flow Check valve:

Body & insert:PVDF Check Ball:Ceramic Spring:Hastelloy C-276 Ball Seat O-ring:.....FKM (optional EPDM) Static Seal O-ring:FKM (optional EPDM)

Ancillary Items provided

Suction Tubing:3/8" OD x 1/4" ID x 10' Clear PVC

Discharge Tubing:3/8" OD x 1/4" ID x 10' Polyethylene (LLDPE)

Suction Strainer:PVDF

Suction Strainer:

Body:.....PVDF Check Ball:Ceramic

Ball Seat O-ring:.....TFE/P (optional EPDM)

With "M" tubing M/NPT connections only:

Suction Strainer:

Body:....PVDF Check Ball:Ceramic

Ball Seat O-ring:.....TFE/P (optional EPDM)

Non-Wetted components:

Enclosure:

413 Aluminum (Polyester powder coated)

Pump Head:

Valox® (PBT) thermoplastic

Pump Head Cover:

Polycarbonate for added strength and chemical resistance. Permanently lubricated sealed motor shaft support ball bearing.

Cover Screws:

Stainless Steel

Roller Assembly:

Rotor:Valox[®] (PBT) Rollers:PVDF Roller Bearings:SS Ball Bearings

Motor Shaft:

Chrome plated steel

TFD System Sensor pins:

Hastelloy C-276

Power Cord:

3 conductor. SJTW-A Water-resistant

Tube Installation Tool:

GF Nylon

Mounting Brackets and Hardware:

316 Stainless Steel

3.0 Features

Peristaltic pump design does not have valves that can clog requiring maintenance.

Self priming - even against maximum line pressure. By-pass valves are not required. Cannot vapor lock or lose prime.

Variable speed DC motor.

Rated for continuous duty (24X7).

Specially engineered tubing for long life at high pressures. Meets FDA 21 CFR requirements for food contact applications.

Patented Tube Failure Detection (TFD) system. Senses tube failure by detecting chemical in pump head.

Molded squeeze rollers and molded alignment rollers for optimum squeeze, unparalleled accuracy, and tube life.

Heavy duty rotor - single piece plastic rotor means no flexing and increased accuracy with no metal springs or hinges to corrode.

Inject at maximum pressure in either direction (clockwise and counter clockwise).

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

3.1 Agency Listings



This pump is ETL listed to conforms to the following: UL Standard 1081 as a motor operated water pump. CSA Standard C22.2 as process control equipment



This pump complies to the Machinery Directive 2006/42/EC, Low Voltage Directive 2014/35/EU, EN 60335-2-41, EMC Directive 2014/30/EU & EN 55014-1, EN 55014-2.



Symbol	Explanation
*	WARNING, risk of electric shock
	CAUTION, refer to users' guide
(GROUND, PROTECTIVE CONDUCTOR TERMINAL

Enclosure Rating:

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

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

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4.0 Installation

CAUTION	Risk of chemical overdose. Be certain pump does not overdose chemical during backwash and periods of no flow in circulation system.
CAUTION	Always wear protective clothing, face shield, safety glasses and gloves when working on or near your metering pump. Additional precautions should be taken depending on solution being pumped. Refer to MSDS precautions from your solution supplier.
CAUTION	All diagrams are strictly for guideline purposes only. Always consult an expert before installing metering pump on specialized systems. Metering pump should be serviced by qualified persons only.
CAUTION	Be sure that installation does not constitute a cross connection with drinking water supply. Check your local plumbing codes.

4.1 Mounting Location

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

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

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

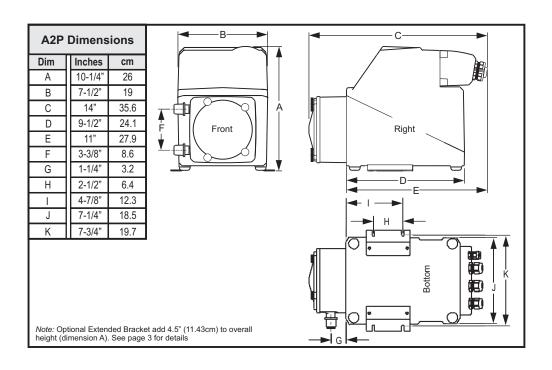
Mounting pump lower than chemical container will gravity feed chemical into it. This "flooded suction" installation will reduce output error due to increased suction lift. A shut-off valve, pinch-clamp, or other means to halt gravity feed to pump must be installed during servicing.

Important! Install a back flow prevention check valve at discharge side of pump to prevent system fluid from flowing back through pump during tube replacement or if tube should rupture.

Important! A pressure relief valve is recommended at discharge of pump to prevent premature wear and damage to pump tube in event discharge line becomes blocked.

Flex-Pro does not require back pressure. Keep discharge pressure as low as possible to maximize tube life.

4.2 Dimensions

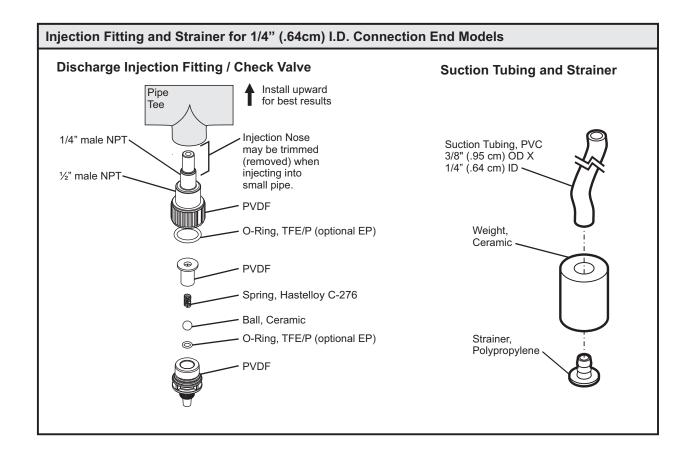


4.3 Installing Injection Fitting and Strainer

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

CAUTION

This Pump Has Been Evaluated for Use with Water Only. This Pump has also been tested by NSF International for use with 12-1/2% Sodium Hypochlorite only.



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5.0 Power Connections

WARNING

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



Electrical connections and grounding (earthing) must conform to local wiring codes. Be certain that a grounding conductor is connected to terminal T11-1 located in wiring compartment.



Risk of electric shock - Disconnect electricity before removing wiring compartment cover.

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

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

Power switch located in Junction Box.

Use voltage your power cord is rated for.

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

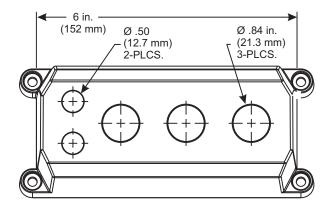
Permanently connected models must be properly grounded. Be certain that a grounding conductor is connected to terminal T11-1 located in wiring compartment.

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

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

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

WIRING COMPARTMENT COVER



POWER CORD OPTIONS

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



115V 50/60Hz NEMA 5/15 (USA) max: 125V AC

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

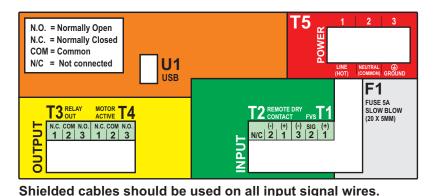
CEE 7/VII (EU) max: 250V AC

Included cable and conduit connectors:

OTY. DESCRIPTION

- Qty: 2 .50 Inch (12.7 Mm) Liq-tight Hole Plugs (mat'l = Neoprene), Pre-installed
- Qty: 3 .875 Inch (22.2 Mm) Liq-tight Hole Plugs (mat'l = Neoprene), 2 Pre-installed
- Qty: 2 .50 Inch (12.7 Mm) Liq-tight Connectors For Pass Thru Cords (mat'l = Nylon) Acceptable Cable Diameter .12 To .26 Inch (3.0 To 6.5 Mm), Not Installed
- Qty: 3 .875 Inch (22.2 Mm) Liq-tight Connectors For Pass Thru Cords (mat'l = Nylon)
 - Acceptable Cable Diameter .20 To .40 Inch (5.1 To =10.0 Mm), 1 Pre-installed W/ Power Cord Models
- Qty: 2 Metallic Lig-tight Connectors For .50 Inch Flexible Conduit (mat'l = Die Cast Zinc), Not Installed

5.1 Wiring Terminals and I/O Schematics

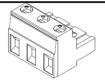




Risk of electric shock - All wiring must be insulated and rated 300V minimum.



Terminals T1 Thru T8 Plug type 16 - 24 AWG



Power Input Terminal T11 Plug type 14 - 30 AWG

FUNCTION	TERM	PIN#	RATING	ELECTRICAL SP.	BLOCK DIAGRAM
INPUT: FVS SYSTEM	T1	1	(+) POSITIVE		BLACK (-) SIG (+) T1 3 2 1 FVS
(FLOW VERIFICATION SENSOR) FV SENSOR ONLY	T1	2	SIGNAL		BLUE-WHITE FVS SENSOR BARE
. v oznosnome	T1	3	(-) NEGATIVE		RED (+)
INPUT: REMOTE START / STOP	T2	1	(+) POSITIVE	NO VOLTAGE	OPEN CIRCUIT IMPEDANCE MUST
(DRY CONTACT C.)	T2	2	(-) NEGATIVE		BE GREATER THAN 50K OHM (+)
OUTPUT: RELAY, 3 AMP	Т3	1	NORM. CLOSED	Form C 3 AMP MAX AT	SWITCH LOAD NC
	Т3	2	COMMON	250 VAC, 3 AMP MAX AT 30 VOLT DC	3 AMP MAX @ 250V AC
	Т3	3	NORM. OPEN	00 1021 20	NO 3 AIMP MAX @ 30V DC 7 NO 3 2 1 NO
OUTPUT: CONTACT CLOSE	T4	1	NORM. CLOSED	2 AMP MAX AT 250 VAC, 30 VDC	SWITCH LOAD NC
MOTOR ACTIVE	T4	2	COMMON		SWITCH LOAD 2 AMP MAX @ 250V AC 1 AMP MAX @ 30V DC C 3 2 1 No. COM NC.
	T4	3	NORM. OPEN		NO T4 MOTOS
INPUT: POWER	T5	1	GROUND	96 - 240 VAC 50/60 HZ	AC T5 HOT TO THE METTER BY THE
	T5	2	NEUTRAL	180W	VOLTAGE
	T5	3	LINE (HOT)		FOWER
FUSE	F1	N/A	5 AMP	5A SLOW BLOW (20 X 5MM)	=

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6.0 How to Adjust the Output:

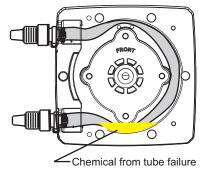
Speed of pumping mechanism is adjustable from 1% to 100%. With manual (MAN) selected, turn adjustment knob to desired percentage of speed.



7.0 TFD (Tube Failure Detection)

Flex-Pro is equipped with a *Tube Failure Detection* System which is designed to stop pump and provide an output alarm in event pump tube should rupture and chemical enters pump head. Pump will detect a chemical with a conductivity reading greater than 500 microsiemens. Chemicals with a conductivity of less than 500 microsiemens will not be detected.

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



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

If TFD alarm occurs, pump will stop, and close an alarm output.

Confirm Chemical Detection

To determine if your chemical will be detected by system, remove pump head cover and pump tube and roller assembly.

Place a small amount of chemical in bottom of pump head - just enough to cover sensors. Replace pump head cover only.

Turn on pump (press START). If TFD system detects chemical, pump will stop after a two second confirmation period. If TFD system does not detect chemical, pump will continue to run after confirmation period.

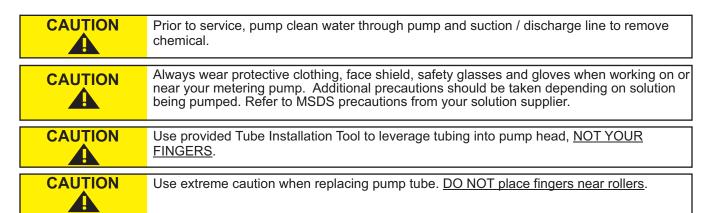
Carefully clean chemical out of pump head being sure to remove all traces of chemical from sensor probes. Replace roller assembly and tubing. Replace pump head cover. Press START button to clear alarm condition and restart pump.

8.0 Alarm Relay

Pump has a built in 3 amp alarm output relay. Relay is pre-configured to energize on tube failure detection (TFD)

A Flow Verification Sensor must be installed and configured for relay to trigger on no-flow conditions.

9.0 Tube Replacement



9.1 Tube Removal

Step 1

All service work should be performed by qualified personnel only.

Wear protective clothing, face shield, safety glasses and gloves during tube replacement.

If pump head cover is removed while unit is running, pump motor will stop.



Relieve (remove) system pressure on discharge and suction side of pump. Failure to do so will cause solution to squirt when disconnecting tube connections.

SAFETY FIRST, REMOVE PRESSURE...

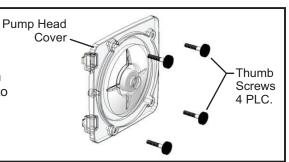
Disconnect system plumbing from pump tube adapters.

Step 2

Place switch in OFF position.

Using provided tool remove four black thumb screws from front of pump head cover. Turn screws counterclockwise to remove.

Remove pump head cover by pulling straight out.



Step 3

With pump stopped, securely grab hold of suction side of tube adapter.

CAUTION! Keep fingers away from rollers and rotor.

Place switch in Manual (MAN) position to allow rotation of rotor.

Rotor will rotate at a maximum of 6 RPM for your safety

Gently pull suction side tube adapter out, away from pump.



Step 4

Continue to pull suction side adapter out of pump head.

while rotor is in rotation.

Place switch back in OFF position.

Carefully pull discharge side of tube adapter out of pump head.

Dispose of used tubing properly.



Suction side

tube adapter



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9.2 **Tube Installation**

Before you begin. Thoroughly clean Pump Head and Rotor. Rotor can be removed by pulling straight out. After cleaning process, push Rotor back on shaft. See drawing below for proper assembly. IMPORTANT! Rotor direction; word "FRONT" on Rotor must face forward (front of pump).

Step 1

Make sure the pump is stopped.

With pump stopped, press suction side of tube adapter securely into pump head.

Clip Tube Installation Tool to discharge side of tube adapter.

Always keep fingers away from rollers and rotor.





Installation Tool

Installation Tool

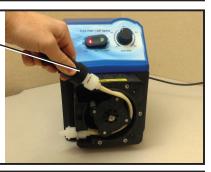


Step 2

Your hand should only come in contact with installation tool.

Place switch in Manual (MAN) position.

Use installation tool to leverage tubing into pump head while rotor is rotating.



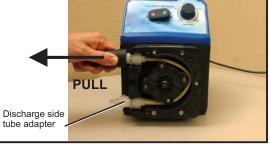
Step 3

Continue to hold onto installation tool

Allow rotor to rotate a few times, this will stretch tubing out.

After a few rotations, pull installation tool and tubing in direction of rotation.

Press discharge side of tube adapter securely into pump head.

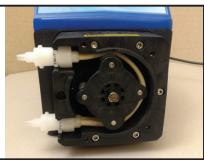


Step 4

Place switch in OFF position.

Suction and discharge tube adapter ends should be securely held in place on pump head as illustrated in photo.

Secure pump head cover to pump head using four black thumb screws max torque 6-8 in. lbs.





Tube Installation Tool 90002-278



Allen Wrench 90008-162

10.0 Pump Maintenance



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

Routine Inspection and Maintenance

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

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

How to Clean and Lubricate Pump

Pump will require occasional cleaning. Amount will depend on severity of service.

- When changing pump tube assembly, pump head chamber, roller assembly and pump head cover should be wiped free of any dirt and debris.
- "When changing pump tube assembly, wipe motor shaft with clean towel. Apply a small amount of grease to shaft. This will help prevent possibility of rotor sticking to motor shaft.
- Although not necessary, 100% silicone lubrication may be used on roller assembly.

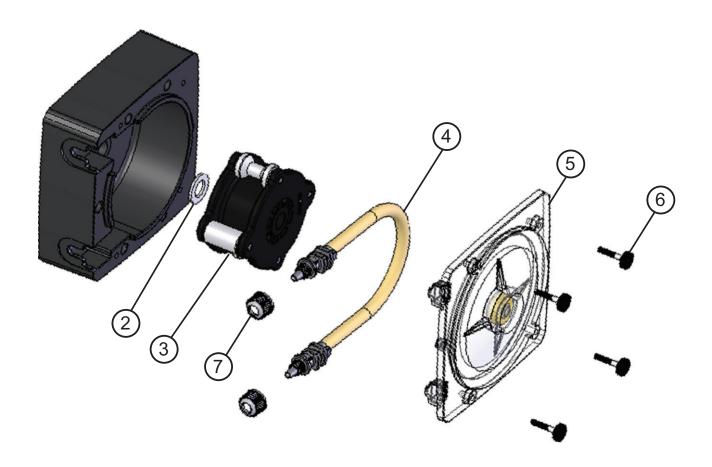
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Replacement Parts List

Peristaltic Metering Pump

		Item	Description	Part Number	QTY
		2	Spacer, Back	90011-217	1
		3	Roller Assembly Complete (Rotor), For NEE and NGG Tubes	A2-SNGG-R	1
e ®	Tubing in this group are interchangeable with single roller assembly (rotor).	4	Tube Assembly, 3/8" OD Tube Compression, Flex-A-Prene NGG (.187 ID)	A2P-SNGG-T	1
en.		4	Tube Assembly, 3/8" OD Tube Compression, Flex-A-Prene NEE (0.093 ID)	A2P-SNEE-T	1
جَب					
Flex-A-Prene®		5	Pump Head Cover, Polycarbonate - New design, backwards compatible	A2-SXX-C	1
		6	Thumb Screw w/ 5/8" Key Drive, max torque 6-8 in. lbs (4 required per pump, sold individually)	90011-237	1
ш		7	Tube Nut, Compression, For 3/8" Tubing (2 required per pump, sold individually)	C-330-6	1



LIMITED WARRANTY

Your new Flex-Pro pump is a quality product and is warranted for 24 months from date of purchase (proof of purchase is required). The pump will be repaired or replaced at our discretion. Pump Head and roller assembly is warrantied against damage from chemical attack when proper TFD (Tube Failure Detection) system instructions and maintenance procedures are followed.

WHAT IS NOT COVERED

- · 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 ProSeries service center.
- Pumps that have been tampered with, or in pieces.
- Damage to the pump that results from misuse, carelessness such as chemical spills on the enclosure, abuse, lack of maintenance, or alteration which is out of our control.
- Pumps damaged by faulty wiring, power surges or acts of nature.

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

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

OTHER IMPORTANT WARRANTY INFORMATION

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

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

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

PROCEDURE FOR IN WARRANTY REPAIR

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



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

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



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