# S SERIES PERISTALTIC PUMP S30 & S40 MODELS INSTALLATION AND MAINTENANCE MANUAL

## **PERISTALTIC METERING PUMPS SINCE 1957**



TO BE INSTALLED AND MAINTAINED BY PROPERLY TRAINED PROFESSIONAL INSTALLER ONLY. READ MANUAL & LABELS FOR ALL SAFETY INFORMATION & INSTRUCTIONS.

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IMS 100319 FW 3.01.01

### WARRANTY AND CUSTOMER SERVICE

#### LIMITED WARRANTY

Stenner Pump Company will for a period of 2 years from the date of purchase (proof of purchase required) repair or replace – at our option – all defective parts. Stenner is not responsible for any removal or installation costs. Pump tube assemblies and rubber components are considered perishable and are not covered in this warranty. Pump tube will be replaced each time a pump is in for service, unless otherwise specified. The cost of the pump tube replacement will be the responsibility of the customer. Stenner will incur shipping costs for warranty products shipped from our factory in Jacksonville, Florida. Any tampering with major components, chemical damage, faulty wiring, weather conditions, water damage, power surges, or products not used with reasonable care and maintained in accordance with the instructions will void the warranty. Stenner limits its liability solely to the cost of the original product. We make no other warranty expressed or implied.

#### RETURNS

Stenner offers a 30-day return policy on factory direct purchases. Except as otherwise provided, no merchandise will be accepted for return after 30 days from purchase. To return merchandise at any time, call Stenner at 800.683.2378 for a Return Merchandise Authorization (RMA) number. A 15% re-stocking fee will be applied. Include a copy of your invoice or packing slip with your return.

#### DAMAGED OR LOST SHIPMENTS

All truck shipments: Check your order immediately upon arrival. All damage must be noted on the delivery receipt. Call Stenner Customer Service at 800.683.2378 for all shortages and damages within seven (7) days of receipt.

#### **SERVICE & REPAIRS**

Before returning a pump for warranty or repair, remove chemical from pump tube by running water through the tube, and then run the pump dry. Following expiration of the warranty period, Stenner Pump Company will clean and overhaul any Stenner metering pump for a minimum labor charge plus necessary replacement parts and shipping. All metering pumps received for overhaul will be restored to their original condition. The customer will be charged for missing parts unless specific instructions are given. To return merchandise for repair, call Stenner at 800.683.2378 or 904.641.1666 for a Return Merchandise Authorization (RMA) number.

#### DISCLAIMER

The information contained in this manual is not intended for specific application purposes. Stenner Pump Company reserves the right to make changes to prices, products, and specifications at any time without prior notice.

#### TRADEMARKS

QuickPro<sup>®</sup> is a registered trademark of the Stenner Pump Company. Santoprene<sup>®</sup> is a registered trademark of Exxon Mobil Corporation. Versilon<sup>®</sup> is a registered trademark of Saint-Gobain Performance Plastics. Pellethane<sup>®</sup> is a registered trademark of Lubrizol Advanced Materials, Inc. Hastelloy<sup>®</sup> is a registered trademark of Haynes International, Inc. AquaShield<sup>™</sup> is a trademark of Houghton International.

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## **SAFETY INSTRUCTIONS**

## **IMPORTANT SAFETY INSTRUCTIONS**

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

## **READ AND FOLLOW ALL INSTRUCTIONS**

**A WARNING** Warns about hazards that CAN cause death, serious personal injury, or property damage if ignored.

#### 🖄 **A WARNING** ELECTRIC SHOCK HAZARD

### A WARNING RISK OF ELECTRIC SHOCK

Connect only to a branch circuit protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.

### A AVERTISSEMENT RISQUE DE CHOC ELECTRIQUE

Brancher seulement à un réseau électrique protégé par un DDFT. Contactez un électricien certifié si vous ne pouvez pas vérifier que la prise est protégé par un DDFT.

#### A PELIGRO PELIGRO DE DESCARGA ELECTRICA

Conecte a un circuito en derivación protegido por un interruptor de descarga a tierra (GFCI). Contacte a un electricista certificado si no puede verificar que su receptáculo esté protegido por dicho interruptor (GFCI).

- **A WARNING** To reduce the risk of electric shock, replace damaged cord immediately. Contact the factory or an authorized service facility for repair.
- A WARNING DO NOT alter the power cord or plug end. DO NOT use receptacle adapters.
- A WARNING DO NOT use pump with a damaged or altered power cord or plug. Contact the factory or authorized service facility for repair.
- After installation, the power supply plug must be accessible during use.
- A WARNING To reduce the risk of injury, do not permit children to use this product. This appliance is not to be used by persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction.
- A WARNING This pump has not been investigated for use in marine areas.
- A **AVERTISSEMENT** La pompe n'a pas été vérifiée et approuvée pour utilisation sur des applications de installation marine.
- **APELIGRO** Este dosificador no ha sido investigado para uso en áreas marinas.

#### A WARNING EXPLOSION HAZARD

This equipment IS NOT explosion proof. DO NOT install in an explosive environment.

#### A WARNING RISK OF CHEMICAL EXPOSURE AND OVERDOSE

Potential for chemical burns, fire, explosion, personal injury, or property damage. To reduce risk of exposure, the use of proper personal protective equipment is mandatory. To reduce risk of overdosing, follow proper installation methods and recommendations. Check your local codes for additional guidelines.

### 🖄 🛦 WARNING RISK OF FIRE HAZARD

**DO NOT** install or operate on any flammable surface.

**A WARNING** Pump is not recommended for installation in areas where leakage can cause personal injury or property damage.

## SAFETY INSTRUCTIONS continued

## **ACAUTION** Warns about hazards that WILL or CAN cause minor personal injury or property damage if ignored.

- **ACAUTION** To reduce risk of electric shock, pull plug before servicing this pump.
- A CAUTION This pump has been evaluated for use with water only.
- **ACAUTION** Non-submersible pump. Suitable for indoor and outdoor use.
- ATTENTION Pompe non submersible. Adaptée à une utilisation aussi bien à l'intérieur qu'à l'extérieur.
- **ACUIDADO** Dosificador no sumergible. Adecuado para el uso interior y exterior.

#### 

Chemical feed pump installation must always adhere to your local plumbing codes and requirements. Be sure installation does not constitute a cross connection. Check local plumbing codes for guidelines.

- **ACAUTION** Electrical installation should adhere to all national and local codes. Consult licensed professional for assistance with proper electrical installation.
- **ACAUTION** Pump uses a class 2 switching power supply.

### SAVE THESE INSTRUCTIONS

NOTICE: Indicates special instructions or general mandatory action.

This metering pump is portable and designed to be removable from the plumbing system without damage to the connections.

This metering pump and its components have been tested for use with the following chemicals; Sodium Hypochlorite (10-15%), Muriatic Acid (20-22 Baume, 31.5% Hcl), and Soda Ash.

Cette a pompe de dosage et ses composants ont été testés pour utilisation avec les produits chimiques suivants; Hypochlorite de Sodium (solution de 10-15%); Acide Muriatique (20-22 Baume, 31.5% Hcl); Cendre de Soude.

Before installing or servicing the pump, read the pump manual for all safety information and complete instructions. The pump is designed for installation and service by properly trained personnel.

No user replaceable parts inside.

Do not install at altitudes over 2000 meters.

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## **FLOW RATE OUTPUTS**

#### **S30 MODELS** 25 psi (1.7 bar) max.

Item Number Prefix	Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute
S3003	3	100:1	0.40-40	0.017-1.67	2.13-213	0.036-3.56	1.51-151	0.063-6.31	63.09-6309	1.05-105
<b>S3004</b>	4	100:1	0.60-60	0.025-2.50	3.20-320	0.053-5.33	2.27-227	0.095-9.46	94.64-9464	1.58-158
S3005	5	100:1	0.85-85	0.035-3.54	4.53-453	0.076-7.56	3.22-322	0.134-13.41	134.07-13407	2.23-223
						Approximate	e Output @ 50/	60Hz		

#### **S30 MODELS** 100 psi (6.9 bar) max.

Item Number Prefix	Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute		
S3003	1	100:1	0.05-5	0.002-0.21	0.27-27	0.004-0.44	0.19–19	0.008-0.79	7.89-789	0.13-13		
S3004	2	100:1	0.17-17	0.007-0.71	0.91-91	0.015-1.51	0.64-64	0.027-2.68	26.81-2681	0.45-45		
S3005	7	100:1	0.40-40	0.017-1.67	2.13-213	0.036-3.56	1.51-151	0.063-6.31	63.09-6309	1.05–105		
				Approximate Output @ 50/60Hz								

#### **S40 MODELS** 25 psi (1.7 bar) max.

Item Number Prefix	Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute
S405X	5X	100:1	1.5-150.0	0.06-6.25	8.0-800.0	0.13-13.33	5.7-567.8	0.24-23.66	236.59-23658.82	3.94-394.31
						Approximat	te Output @ 5	50/60Hz		

#### **S40 MODELS** 100 psi (6.9 bar) max.

Item Number Prefix	Tube	Turndown Ratio	Gallons per Day	Gallons per Hour	Ounces per Hour	Ounces per Minute	Liters per Day	Liters per Hour	Milliliters per Hour	Milliliters per Minute
S407X	7X	100:1	0.6-60.0	0.03-2.50	3.2-320.0	0.053-5.34	2.3-227.0	0.09-9.46	94.64-9463.54	1.58-157.73
						Approxima	te Output @ 5	50/60Hz		

NOTICE: The information within this chart is solely intended for use as a guide. The output data is an approximation based on pumping water under a controlled testing environment. Many variables can affect the output of the pump. Stenner Pump Company recommends that all metering pumps undergo field calibration by means of analytical testing to confirm their outputs.

## **MATERIALS OF CONSTRUCTION**

All Housings Polycarbonate

Pump Tube Santoprene<sup>®</sup> (FDA approved) or Versilon<sup>®</sup>

Check Valve Duckbill (S30 Models) Santoprene<sup>®</sup> (FDA approved) or Pellethane<sup>®</sup>

#### Ball Check Valve Components (S40 Models)

- Ceramic ball (FDA approved); tantalum spring; FKM seat & O-ring OR
- Ceramic ball (FDA approved); stainless steel spring; EPDM seat; Santoprene® O-ring

Pump Head Rollers Polyethylene

Roller Bushings Oil impregnated bronze

Suction/Discharge Tubing, Ferrules 1/4" & 6 mm Polyethylene (FDA approved)

**Tube Fittings & Injection Fittings** PVC or Polypropylene (both NSF listed)

**Connecting Nuts** PVC or Polypropylene (both NSF listed)

**3/8" Adapter (S30 Models)** PVC or Polypropylene (both NSF listed)

Suction Line Strainer and Cap PVC or Polypropylene (both NSF listed); ceramic weight

All Fasteners Stainless steel

Pump Head Latches (S30 Models) Polypropylene

Pump Head Latches (S40 Models) Stainless steel

Leak Detect Components Hastelloy<sup>®</sup>

## **CHEMICAL RESISTANCE GUIDE**

#### **Ratings Key – Chemical Effect**

- A Fluid has minor or no effects
- **B** Fluid has minor to moderate effects
- **C** Fluid has severe effects
- · No data available

**A CAUTION** The information is provided ONLY as a guide to assist in determining chemical compatibility for wetted components. Testing under the specific conditions of the application is recommended. Stenner Pump Company assumes no responsibility for its accuracy. Outside factors including but not limited to temperature, pressure, mechanical stress, and solution concentration can affect material compatibility in a particular application. Stenner makes no warranty, expressed or implied, as to the accuracy of this guide or any materials' suitability for fitness or purpose for any application. User assumes all risk and liability for use of this guide.

Chemical / Solution	PP Santoprene EPDM	Versilon	PVC	LDPE	FKM	Silicone	Tantalum	Stainless Steel
Acetic Acid 20%	А	В	В	А	В	А	А	А
Acetic Acid 30%	В	С	С	Α	В	А	А	В
Acetic Acid, Glacial	С	С	С	С	С	•	А	Α
Acetic Anhydride	В	С	С	С	С	С	•	Α
Aliphatic Hydrocarbons	В	В	В	В	•	•	•	•
Aluminum Chloride	А	A	А	В	А	В	Α	В
Aluminum Sulfate	А	А	А	А	А	Α	А	В
Alums	А	А	А	А	А	Α	•	Α
Ammonium Acetate	В	В	А	А	А	•	•	Α
Ammonium Carbonate	А	А	А	А	А	С	•	В
Ammonium Chloride	А	В	А	В	А	С	А	В
Ammonium Hydroxide	А	В	А	А	В	А	В	А
Ammonium Nitrate	А	А	А	А	В	С	А	А
Ammonium Phosphate	А	А	А	А	А	Α	•	С
Ammonium Sulfate	А	А	А	А	В	А	А	В
Amyl Acetate	A	С	С	С	С	С	•	Α
Aniline	В	С	С	С	С	С	А	В
Antimony Salts	А	A	А	В	•	•	•	•
Arsenic Salts	А	A	А	В	•	•	•	•
Barium Hydroxide	А	A	А	В	А	•	В	В
Barium Salts	А	•	А	В	•	Α	•	•
Beer	А	A	А	Α	А	•	А	Α
Benzene	С	С	С	С	В	•	•	В
Benzoic Acid	А	С	А	Α	А	•	А	В
Bleach 5.25%	А	A	А	Α	А	•	•	•
Boric Acid	А	A	А	Α	А	Α	А	Α
Bromine	А	В	В	В	А	С	А	С
Butyl Acetate	А	С	С	С	С	С	•	Α
Butyric Acid	А	С	В	С	В	С	А	В
Calcium Chloride	А	A	В	Α	А	•	А	В
Calcium Hydroxide	А	С	А	Α	А	•	В	В
Calcium Hypochlorite 5%	А	В	А	Α	А	•	А	В
Calcium Salts	А	A	А	Α	•	В	•	•
Carbon Disulfide	С	С	С	С	Α	•	•	В
Carbon Tetrachloride	С	С	С	С	Α	С	•	В
Castor Oil	В	A	Α	•	А	•	•	Α
Chlorine	see Sodiu	іт Нурос	hlorite					

Chemical / Solution S	PP antoprene EPDM	Versilon	pvc	LDPE	FKM	Silicone	Tantalum	Stainless Steel
Chloroacetic Acid	А	С	В	С	С	•	•	A
Chloroform	С	С	С	С	А	С	•	Α
Chlorosulfonic Acid	В	С	С	С	С	С	•	В
Chromic Acid < 50%	В	С	В	Α	А	С	А	В
Chromium Salts	Α	•	А	В	•	•	•	•
Citric Acid	В	В	В	С	А	•	А	A
Copper Chloride	Α	А	А	А	А	•	Α	С
Copper Sulfate	Α	A	А	Α	А	•	А	В
Cottonseed Oil	В	A	В	Α	А	•	•	A
d-Limonene	С	В	В	В	А	С	•	•
Ethyl Acetate	Α	С	С	С	С	В	•	В
Ethyl Alcohol	В	С	С	В	В	•	Α	•
Ethyl Chloride	С	С	С	С	А	С	•	Α
Ethylene Dichloride	С	С	С	С	А	С	•	В
Ethylene Glycol	Α	А	А	А	А	А	•	В
Ethylene Oxide	В	A	С	С	С	С	•	В
Eucalyptus Oil	С	В	С	С	•	•	•	•
Fatty Acids	С	В	А	Α	А	С	•	Α
Ferric Chloride	А	А	А	А	А	В	Α	С
Ferric Sulfate	Α	A	А	Α	А	В	•	В
Ferrous Chloride	Α	A	А	Α	А	С	•	С
Ferrous Sulfate	Α	A	А	Α	А	С	•	В
Fluoboric Acid	Α	С	А	С	В	Α	•	•
Fluosilicic Acid	Α	A	А	Α	А	С	•	В
Formaldehyde < 40%	Α	В	А	С	С	В	•	Α
Formic Acid	Α	С	В	С	С	С	А	Α
Glucose	Α	А	А	А	А	А	•	Α
Glycerin	Α	А	А	А	А	А	•	Α
Hydrochloric Acid 20%	Α	С	А	А	А	С	Α	С
Hydrochloric Acid 37%	Α	С	А	Α	А	С	А	С
Hydrocyanic Acid	Α	В	А	Α	А	С	А	Α
Hydrofluoric Acid < 48%	А	С	В	А	А	С	С	С
Hydrofluoric Acid 48-75%	А	С	С	С	А	С	С	С
Hydrofluoric Acid, anhydrous	В	С	С	С	С	•	С	С
Hydrogen Peroxide < 50%	Α	В	Α	В	Α	Α	Α	A
Hydrogen Sulfide	Α	А	В	A	С	•	•	A
lodine	Α	А	С	В	А	С	А	С

Chemical / Solution	PP Santoprene EPDM	Versilon®	pvc	LDPE	FKM	Silicone	Tantalum	Stainless Steel	Che	emical / Solution	PP Santoprene <sup>®</sup> EPDM	Versilon®	pvc	LDPE	FKM	Silicone	Tantalum	Stainles Steel
Lactic Acid	А	В	В	А	А	А	А	В	Sili	cone Oil	С	А	А	В	А	С	•	А
Lead Acetate	В	А	А	А	С	С	•	В	Silv	er Nitrate	А	А	А	А	А	А	•	В
Linseed Oil	В	А	А	А	А	А	•	А	Soa	p Solutions	А	А	А	С	А	А	•	А
Limonene	С	В	В	В	А	С	•	•	Soc	lium	А	А	А	А	•	•	•	•
Lubricating Oils	С	А	В	С	А	•	•	А	Soc	lium Bisulfate	А	А	А	А	А	•	•	С
Magnesium Chloride	А	А	В	А	А	А	А	С	Soc	lium Bisulfite	А	А	А	А	А	А	•	В
Magnesium Hydroxide	А	А	А	А	А	•	А	А	Soc	lium Borate	А	А	А	А	А	А	•	В
Magnesium Sulfate	А	А	А	А	А	А	А	В	Soc	lium Carbonate	А	А	А	А	А	А	•	А
Malic Acid	А	В	А	А	А	В	•	А	Soc	lium Chlorate	А	А	А	А	А	С	•	В
Manganese Salts	А	А	А	А	•	В	•	•	Soc	lium Chloride	А	А	А	А	А	А	А	В
Mercuric Chloride	А	А	А	А	А	•	•	С	Soc	lium Dichromate 20%	А	•	В	•	А	•	•	•
Methylene Chloride	С	С	С	С	В	•	А	В	Soc	lium Hydroxide < 20%	А	В	А	В	С	A	В	В
Mineral Oil	В	А	В	В	А	•	•	•	Soc	lium Hydroxide 20-46.5%	А	С	А	В	С	•	С	В
Mineral Spirits	С	А	В	В	А	•	•	Α	Soc	lium Hypochlorite 5%	A*	В	А	A	А	В	А	С
Muriatic Acid, 20° Baume	А	С	А	Α	А	•	•	•	Soc	lium Hypochlorite 6-15%	A*	В	А	A	А	В	А	С
Nitric Acid < 10%	А	С	А	В	А	В	А	A	Soc	lium Nitrate	А	А	А	А	А	С	А	В
Nitric Acid 10-30%	В	С	Α	С	А	С	А	Α	Soc	lium Silicate	А	А	Α	А	А	А	•	В
Nitric Acid 30-60%	С	С	В	С	А	С	А	Α	Soc	lium Sulfide	А	А	Α	А	А	А	•	С
Nitric Acid 70%	С	С	В	С	А	С	А	Α	Soc	lium Sulfite	А	А	Α	А	А	А	•	А
Nitric Acid, red fuming	С	С	С	С	С	С	•	•	Sol	vents	С	В	В	В	•	•	•	•
Nitrous Acid	А	В	•	•	В	•	•	В	Soy	/bean Oil	В	А	А	Α	А	•	•	А
Oleic Acid	А	В	С	С	В	С	•	А	Sta	nnous Chloride 15%	А	А	А	В	А	•	•	А
Oleum 20-25%	С	С	С	С	•	•	•	В	Ste	aric Acid	А	В	В	В	А	В	•	А
Oxalic Acid	А	С	В	Α	А	С	А	А	Sul	fur Dioxide liquid	А	С	С	С	В	•	•	А
Palmitic Acid	А	В	В	Α	А	С	•	А	Sul	fur Trioxide	В	С	А	С	А	•	•	С
Petroleum Distillates	С	В	В	С	•	•	А	А	Sul	furic Acid < 40%	В	В	В	В	А	С	А	С
Peracetic Acid 5%	В	В	В	Α	А	А	•	•	Sul	furic Acid > 40%	С	С	С	С	А	С	А	С
Peracetic Acid 15%	В	В	В	Α	А	В	•	•	Sul	furous Acid	А	А	А	В	С	С	•	В
Phenol	В	С	С	В	А	С	•	В	Tan	nic Acid 10%	А	В	А	В	А	В	•	А
Phosphoric Acid	А	С	А	Α	А	С	А	С	Tan	ning Liquors	А	А	А	Α	А	•	•	А
Phthalic Acid	А	С	А	Α	А	В	•	А	Tar	taric Acid	А	А	А	Α	А	А	•	С
Pickling Solutions	А	С	•	•	В	•	•	•	Tita	inium Salts	А	А	Α	В	•	•	•	•
Plating Solutions	А	С	•	•	А	С	•	•	Trie	thanolamine	А	С	С	С	С	•	•	•
Polyphosphate	А	А	Α	Α	•	•	•	•	Tris	odium Phosphate	А	Α	Α	A	Α	•	•	В
Potassium Carbonate	А	А	Α	Α	А	•	•	В	Tun	g Oil	В	В	С	С	Α	•	•	•
Potassium Chlorate	А	Α	Α	А	A	В	•	В	Tur	pentine	В	В	С	С	Α	С	•	A
Potassium Hydroxide	А	Α	Α	А	С	С	В	A	Ure	a	В	Α	В	A	Α	В	•	В
Potassium Dichromate	А	Α	Α	А	А	•	•	В	Wa	ter & Brine	Α	Α	Α	A	A	В	•	•
Potassium lodide	А	Α	В	В	A	•	•	A	Zin	c Chloride	А	Α	В	A	Α	A	A	В
Potassium Permanganate	Α	A	A	A	A	•	•	В	Zin	c Salts	A	A	А	A	•	•	•	•
Sea Water	A	A	A	A	A	•	A	С	NO.	TE: FKM tested to ANS	SI/NSF 61	with w	ater or	ılv.				

\* Products tested and certified by WQA according to ANSI/NSF 61 for contact with Sodium Hypochlorite and Water only and ANSI/NSF 372.

## ACCESSORIES

#### **S30 MODELS**

- 3 Connecting Nuts 1/4" or 3/8"
- 3 Ferrules 1/4" or 6 mm Europe
- 1 Injection Fitting 25 psi (1.7 bar) max. or 1 Duckbill Check Valve 100 psi (6.9 bar) max.
- 1 Weighted Suction Line Strainer 1/4", 3/8" or 6 mm Europe
- 1 20' Roll of Suction/Discharge Tubing 1/4" or 3/8", white, UV black or 6 mm white Europe
- 1 Additional Pump Tube
- 2 Additional Latches
- 1 Mounting Bracket
- 1 Quick Start Guide

#### **S40 MODELS**

- 3 Connecting Nuts 3/8"
- 1 Ball Check Valve
- 1 Weighted Suction Line Strainer 3/8"
- 1 20' Roll Suction/Discharge Tubing 3/8", White or UV Black
- 1 Additional Pump Tube
- 1 Mounting Bracket
- 1 Quick Start Guide

## **GENERAL INFORMATION**

The S Series is an advanced peristaltic pump design with multiple programming features and performance indicators. The S Series offers practical and flexible functions for municipal, wastewater and industrial applications.

### **PUMP FEATURES**

- · Brushless DC Motor with ball bearing support
- · Switch mode power supply
- · Microcontroller
- · Blue OLED Display
- · QuickPro® pump head with leak detect sensor
- · Six button keypad on control panel

### **OUTPUT**

- · 0.05 150.0 gpd, pressures to 25 psi
- · 0.05 60.0 gpd, pressures to 100 psi

### **CONTROL PANEL**



### **NAVIGATION BUTTONS**

Button	General Function	Operating Mode Function
L UP	<ul> <li>Moves up in a menu</li> <li>Toggles between menu options</li> <li>Increases a value</li> </ul>	Increases the speed percent in the Manual mode
<b>D</b> OWN	<ul> <li>Moves down in a menu</li> <li>Toggles between options</li> <li>Decreases a value</li> </ul>	Decreases the speed percent in the Manual mode
O PRIME	N/A	Runs pump at 100% speed while button is pressed
ON/OFF	N/A	Turns pump control ON or OFF WARNING: DOES NOT REMOVE POWER
💿 ВАСК	Moves one step back in a menu when permitted	Cycles the display to show different units of output
<b>ENTER</b>	Sets a value	Press and hold for 2 seconds to go to the Main Menu

### **SET UP**

The very first time the pump is turned on, the display will show the Firmware Version followed by the Main Menu screen.



Main Menu
- Configuration
<ul> <li>Control Mode</li> </ul>
- Run Pump

The display will indicate the pump's software version.

If the pump was previously programmed, the display will return to the mode it was in when it was turned off or if power was lost.

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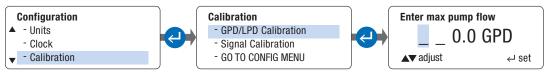
### GENERAL INFORMATION continued

### **HOW TO GET STARTED SUMMARY**



### Mandatory Calibration

From the Configuration menu, select GPD/LPD Calibration, and enter your pump's ACTUAL maximum flow rate output. Refer to illustration below.



#### **IMPORTANT!**

The pump's ACTUAL maximum flow rate entry:

· Affects flow rate output displayed on the screen during operation in all modes.

• Contributes to overall calculation of flow rate output in the PPM modes.



### Program Applicable Pump Parameters

In Configuration menu, program applicable pump parameters, refer to chart below.

Pump Parameters	Description	Control Mode
Display Brightness	Optimal setting is < 50% for extended periods.	All
Units	Default is Gallons; enter Liters, if preferred.	All
Clock	24-hr format. Enter current time of day and day of the week.	All
Leak Detect	Calibrate sensitivity to distinguish between water & your chemical.	All
Tube Timer	Enter number of hours you want pump to run before display shows TUBE CHANGE.	All
Password	Program a password to prevent unauthorized changes to pump settings.	All
Output Relays	Three individual relays available; rated for 24VDC @ 50mA max. Program communication for: • S Series to back-up S Series • S Series to another device	All
Signal Calibration	If factory settings are not sufficient, calibrate the pump using a process meter or powered transmitter.	4-20mA, 0-10VDC
Reset Totalizer	Option to reset the total tallied amount of water treated.	Pulse, Hall Effect, PPM



### Select Mode of Operation

In Control Modes menu, select your mode of operation.

### Program the Options

In your selected control mode, program the options relevant to your application.

5 Run the Pump

## **GENERAL INFORMATION** continued

### COMMUNICATION

PUMP CONDITION	DISPLAY ALAR	M ACTIVATION	OUTPUT REL	AY ACTIVATION	OPERATIONAL MODE
POMP CONDITION	Program	Automatic	Program	Automatic	OPERATIONAL MODE
Tube Change	•		•		
Tube Leak	٠		•		
Standby		•			
Drive Fault		•			
Off		•			All
Run					
Mode Change			•		
Transfer*			•	•	
Repeat Pulse				٠	Manual, 7-day Timer, Cycle Timer, 4-20mA, 0-10VDC, Pulse, PPM Feed: Constant
High Signal	•		•		4-20mA or 0-10VDC
Low Signal	•		•		4-20mA or 0-10VDC
High Flow	•		۰		Hall Effect or PPM Feed: Hall Effect
Low Flow	•		•		Hall Effect
Signal Overrun		•	•		Pulse

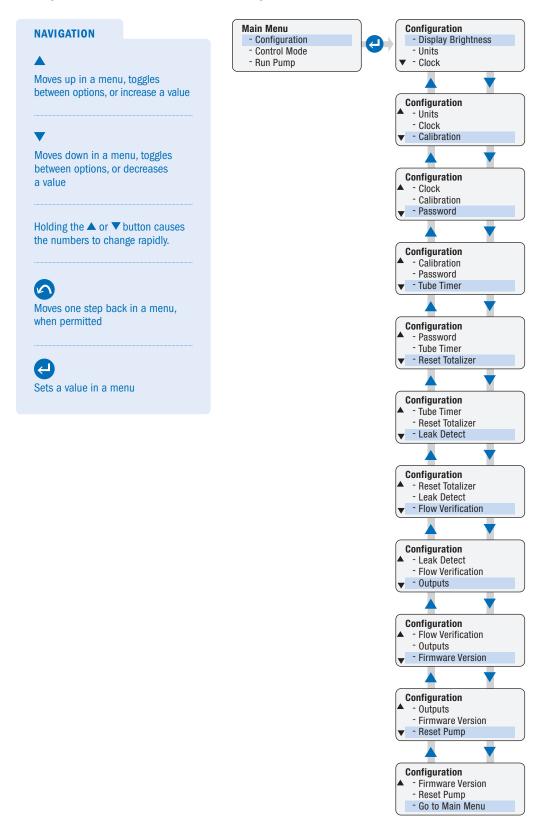
#### **COMMUNICATION ACTIVATED BY PUMP CONDITIONS**

\* Transfer operation from a primary pump to a backup pump via a relay.

## **CONFIGURATION MENU**

### **SUMMARY**

Configure the pump parameters. Configuration should be completed at the initial set up.



### **DISPLAY BRIGHTNESS**

Allows user to adjust the brightness level of the pump display from 0% to 100%. There is some visibility at the minimum setting.

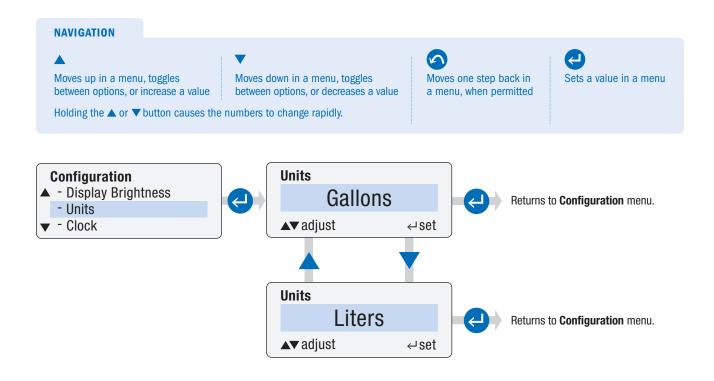
NOTE: For best performance and longevity, the display brightness should not be set higher than 50% for extended periods.





### UNITS

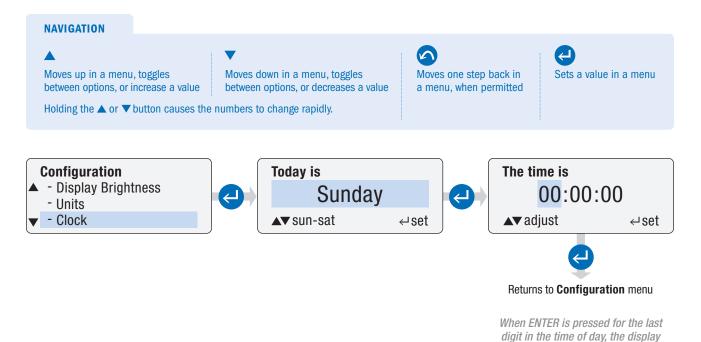
Allows the user to set the unit of measure to Gallons or Liters. The selection appears in the pump display during **Control Mode** programming.



### CLOCK

Allows the user to set the current day of the week and the time of the day. The time is set in a 24 hour clock format only.

NOTE: For the time, the first two digits that control the hour are highlighted together.



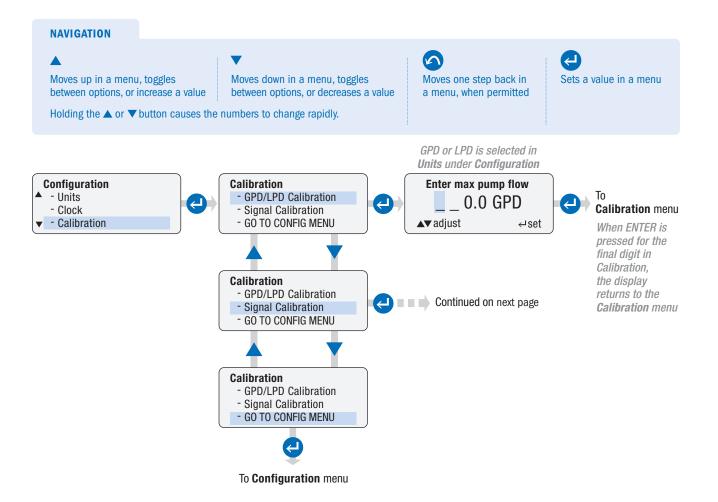
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returns to Configuration menu

### CALIBRATION page 1 of 2

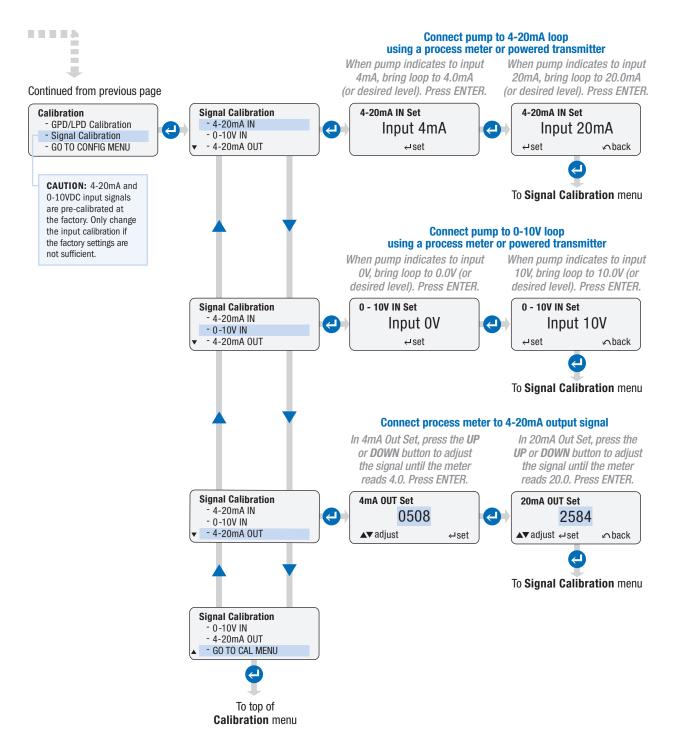
Allows user to set the pump's maximum output. The units displayed in the **Calibration** submenu are controlled by the setting made in the **Units** submenu.

**IMPORTANT:** The value entered (in **Calibration**) for the pump's maximum output is used to calculate the pump's required output for the operating mode in **Run Pump**. The value is also used to calculate the pump's required run speed in the **PPM Feed** submenu in **Control Mode**. For the most accurate dosing possible, determine the actual pump output. Conduct a drawdown from a graduated calibration column against the discharge run and pressure, equivalent to the intended installation.



### CALIBRATION page 2 of 2

Allows user to calibrate analog signal inputs and outputs.

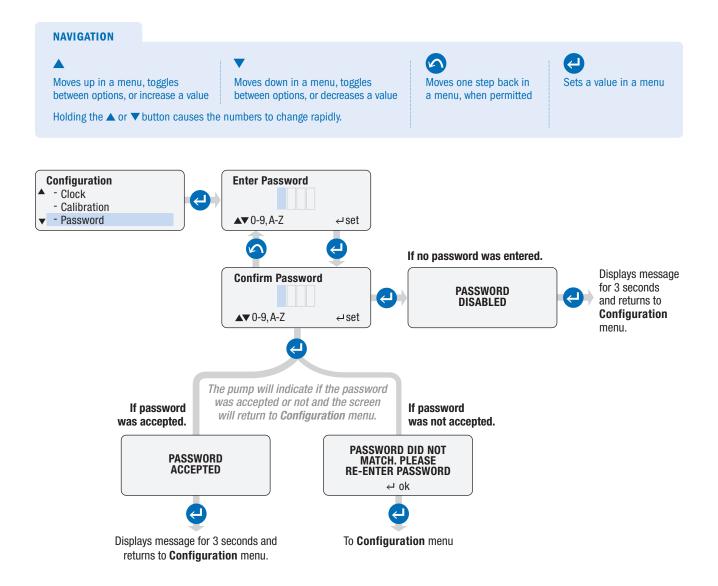


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### **PASSWORD**

Allows user to set a password to prevent unauthorized changes to the pump settings.

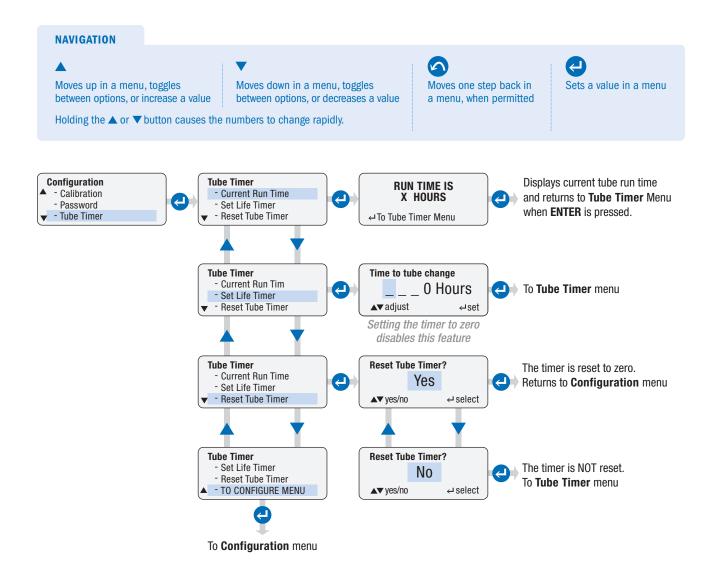
- Each digit can be set for 0-9 or A-Z.
- When the password is set, it must be entered during the Operating Display mode (in **Run Pump**) in order to enter the **Main Menu**.
- · Leaving the password blank disables the password feature. The password is disabled by default.



### **TUBE TIMER**

Allows user to set the tube run time in hours, to initiate the tube change indicator. When the set time is reached, the Operating Display shows **Tube Change**.

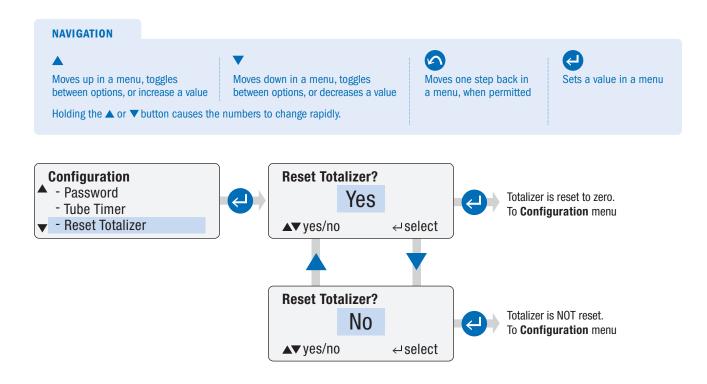
· After the tube is replaced, reset the current run time to zero.



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### **RESET TOTALIZER**

Allows user to reset the flow totalizer when using the **Pulse, Hall Effect,** or **PPM Feed** control modes.



### **LEAK DETECT**

The leak detecting components determine when solution is present in the pump head. When a leak is detected, the tube icon will always appear on the display.

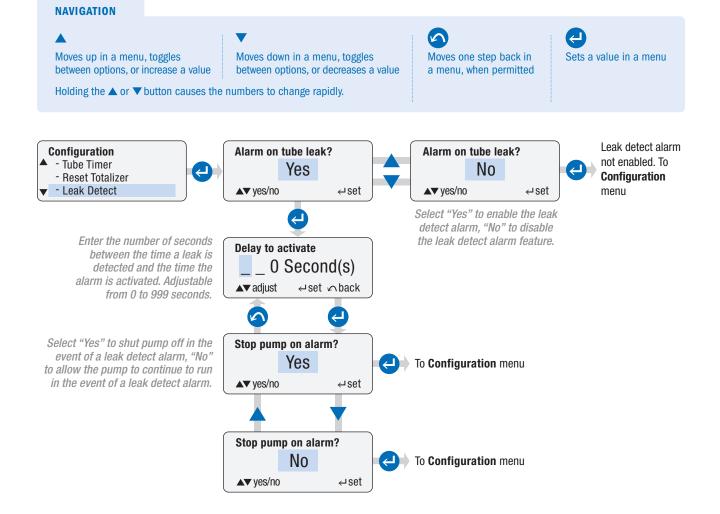
Program how the pump responds when a leak is detected:

- 1. Set the display alarm, TUBE LEAK, to appear on the screen.
- 2. Set the pump to stop or continue to run when TUBE LEAK appears.
- 3. Set a delay (in seconds) for #1 or #2 and/or to activate a relay.

Leak detect is accomplished by sensing conductivity between two metal clips in the tube housing cover. The leak detect bracket and leak detect tube housing cover must be installed in order to use this option.

The alarm on leak detect is disabled by default. The delay for the alarm to activate is also set to zero by default.

Tip: The leak detect sensitivity is factory pre-set to distinguish between water and typical water treatment chemicals. Adjust the sensitivity according to the specific chemical utilized in the application. Adjust with the potentiometer located under the signal cover. Instruction for adjusting are located in *Connections Leak Detect* in this manual.



£ %

Manual

Tube Leak 🛏



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### OUTPUT RELAYS page 1 of 5

Allows user to configure the three internal relays for output indication from the pump to a control system, another pump or miscellaneous receptacle.

- The relays can be programmed Normally Open (NO) or Normally Closed (NC) and are rated for 24VDC @ 50mA maximum.
- Each relay is individually programmed (in Configuration) for each individual pump condition alarm and must be "enabled" to function.

#### AVAILABLE PUMP CONDITIONS TO ACTIVATE RELAYS

Leak Detect: Activates relay if a leak is detected and if Leak Detect is programmed in Configuration.

Run: Automatically activates the relay when the pump is running.

**Transfer:** Activates the relay to transfer operation from the primary pump to a backup pump.

- Automatically activates when a drive fault or loss of power occurs.
- Activates when Leak Detect is programmed in Configuration with the "stop pump" option selected and when a leak occurs.

#### **IMPORTANT!**

- The primary pump's output relay must be wired to the backup pump's Standby input connection.
- The backup pump must be programmed in the same mode of operation as the primary pump.
- The backup pump must be powered by a circuit separate from the circuit powering the primary pump.
- The relay must be programmed as Normally Closed.

**Tube Timer**: Activates relay when the pump run time is reached. The pump run time must be programmed in Configuration.

Drive Fault: Automatically activates the relay if the pump shuts down due to a drive fault error.

**Standby**: Automatically activates the relay if a closed relay is wired into the Standby connection terminals causing the pump to go into Standby.

Off: Automatically activates the relay if the pump is turned OFF from the control panel.

**Mode Change:** Activates the relay if the pump's mode of operation is changed from the operator's selected mode of operation.

#### **OUTPUTS - SPECIFIC MODES OF OPERATION**

#### Low Signal in 4-20mA or 0-10VDC

- Activates the relay if the input signal falls below the value programmed in the control mode.

#### High Signal in 4-20mA or 0-10VDC

- Activates the relay if the the input signal rises above the value programmed in the control mode.

#### Low Flow in Hall Effect

- Activates the relay if the process flow falls below the gpm or lpm programmed in the control mode.

#### **High Flow in Hall Effect or PPM Feed-Variable**

- Activates the relay if the process flow rises above the gpm or lpm programmed in the control mode.

#### **Signal Overrun in Pulse**

- Activates the relay if the pump receives an input signal leading to incorrect dosing.

#### Repeat Pulse - Manual, 4-20mA, 0-10VDC, Pulse, 7 Day Timer, PPM Feed-Constant or Cycle Timer

 Automatically activates the relay when the pump receives the dry contact input signal to repeat this signal to another pump or device.

### **OUTPUT RELAYS** page 2 of 5

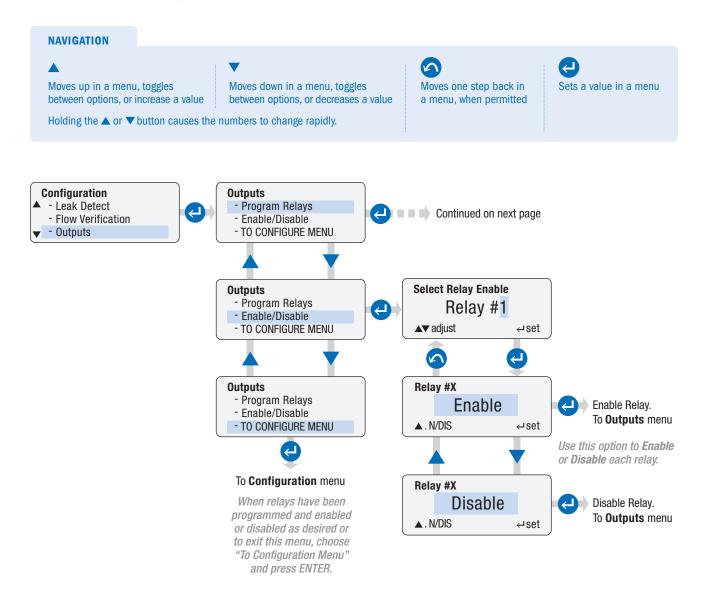
PUMP CONDITION	DISPLAY ALARM ACTIVATION		OUTPUT RELAY ACTIVATION		
	Program	Automatic	Program	Automatic	OPERATIONAL MODE
Tube Change	•		•		AII
Tube Leak	٠		•		
Standby		•			
Drive Fault		•			
Off		•			
Run					
Mode Change			•		
Transfer*			•	•	
Repeat Pulse				٠	Manual, 7-day Timer, Cycle Timer, 4-20mA, 0-10VDC, Pulse, PPM Feed: Constant
High Signal	•		•		4-20mA or 0-10VDC
Low Signal	•		•		4-20mA or 0-10VDC
High Flow	•		٠		Hall Effect or PPM Feed: Hall Effect
Low Flow	•		•		Hall Effect
Signal Overrun		•	•		Pulse

#### COMMUNICATION ACTIVATED BY PUMP CONDITIONS

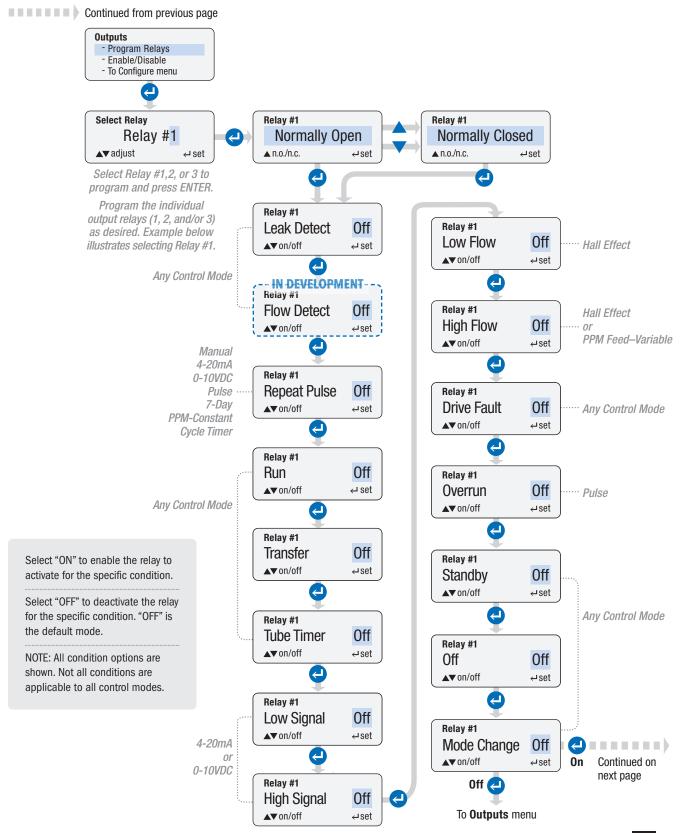
\* Transfer operation from a primary pump to a backup pump via a relay.

### OUTPUT RELAYS page 3 of 5

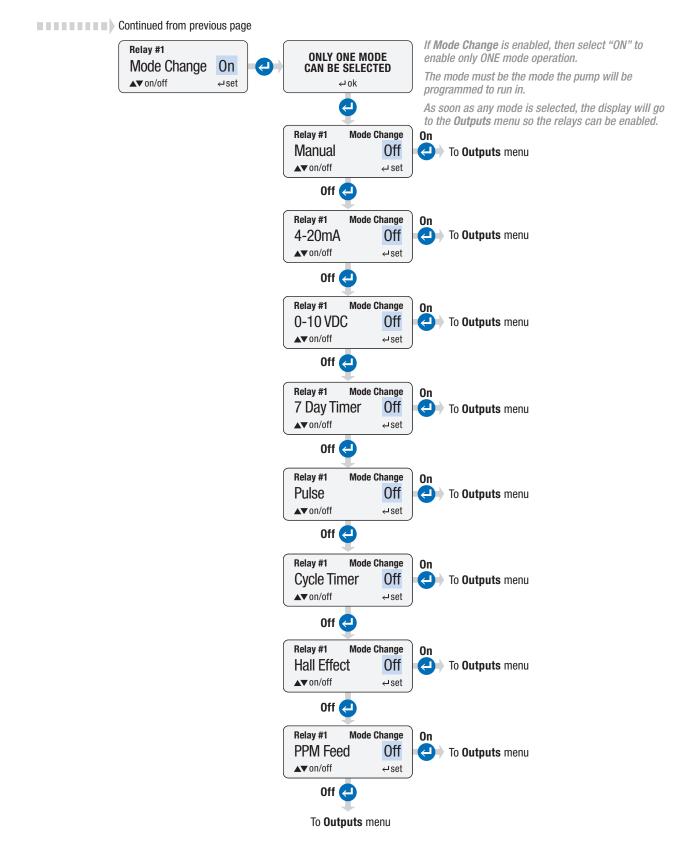
- · Program the individual output relays (1, 2, and/or 3) as desired. Example illustrates selecting Relay #1
- · Enable or disable the relays as desired.



### **OUTPUT RELAYS** page 4 of 5

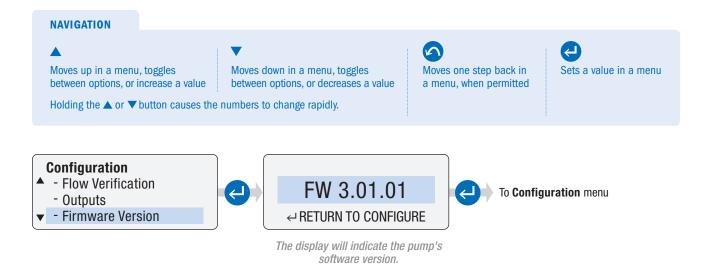


### OUTPUT RELAYS page 5 of 5



### **FIRMWARE VERSION**

Allows user to check the firmware version code in the pump.

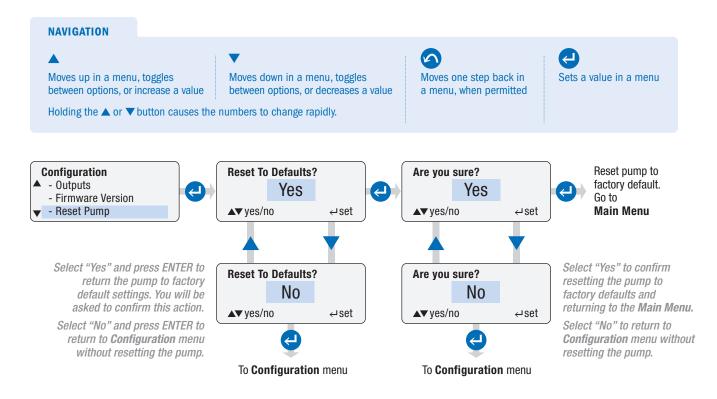


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### **RESET PUMP**

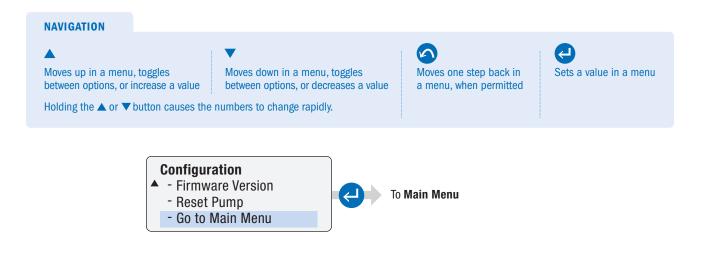
Allows user to reset the pump and return the pump to factory default settings.

NOTE: When resetting a pump with firmware version 2.01.04 or higher, the 4-20mA input signal calibration will be restored to factory defaults.



### **GO TO MAIN MENU**

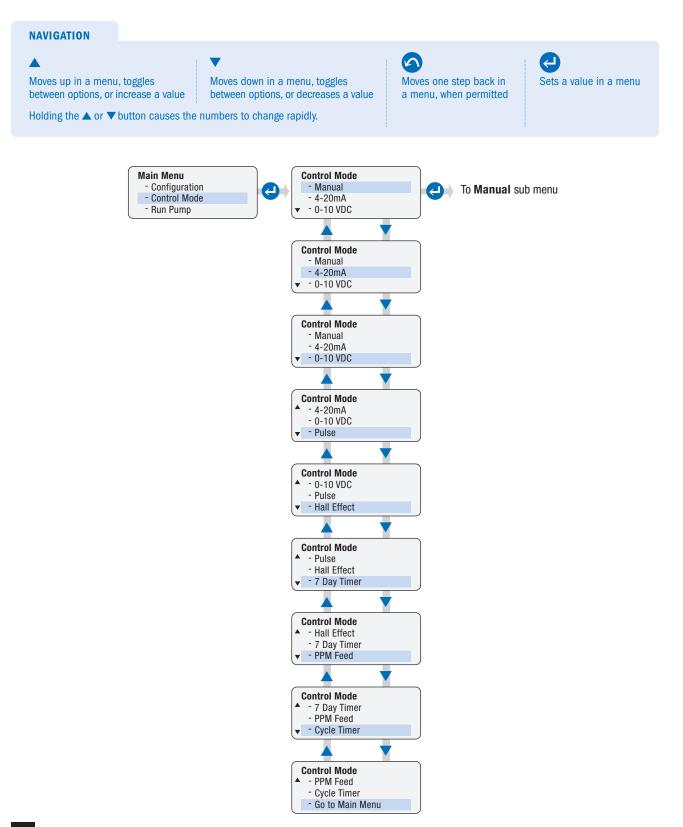
Allows user to return to the Main Menu.



## **CONTROL MODES MENU**

### **SUMMARY**

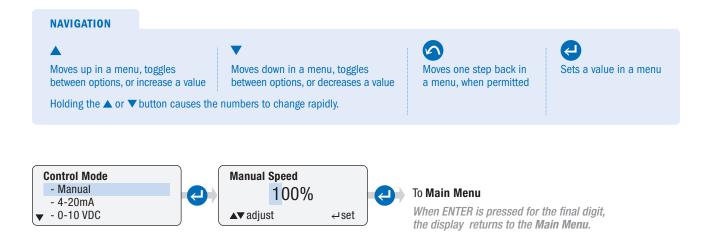
Select the mode of operation and set the parameters.



### MANUAL

Allows user to control the pump speed manually.

Speed can be adjusted from 0 to 100% in one percent increments.



### 4-20mA page 1 of 3

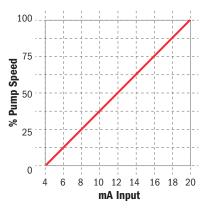
Allows user to configure the pump to respond proportionally to a 4-20mA analog signal. The pump's speed varies according to the level of the 4-20mA signal. The response to the signal can be scaled or inverted (refer to Diagram 1, 2 & 3).

**A WARNING** When operating in an inverted response curve where the minimum signal is associated with the maximum pump speed, the pump will run at the maximum set speed if the signal is lost. It is extremely important to properly set the alarms to prevent overfeed on a loss of signal.

#### ▲ CAUTION MAXIMUM SIGNAL VOLTAGE LEVEL IS 36VDC.

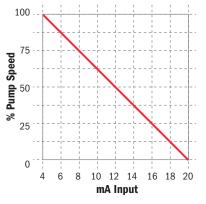
To customize the pump response, set the signal values and the pump speed percent for the high and low range of the signals (refer to Diagram 1).

The signal level and associated speed set points can be set to any level, as long as there is at least 1mA difference between the minimum and maximum signal level and a 10% difference in the speed percent between the two points (refer to Diagram 3).



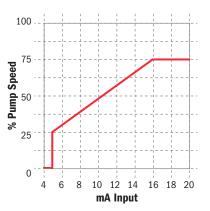
#### **Diagram 1**

Example of standard 4-20mA response curve. Pump programmed to 0% speed @ 4.0mA and 100% speed @ 20.0mA.



#### Diagram 2

Example of standard 20-4mA inverted response curve. Pump programmed to 100% speed @ 4.0mA and 0% speed @ 20.0mA.

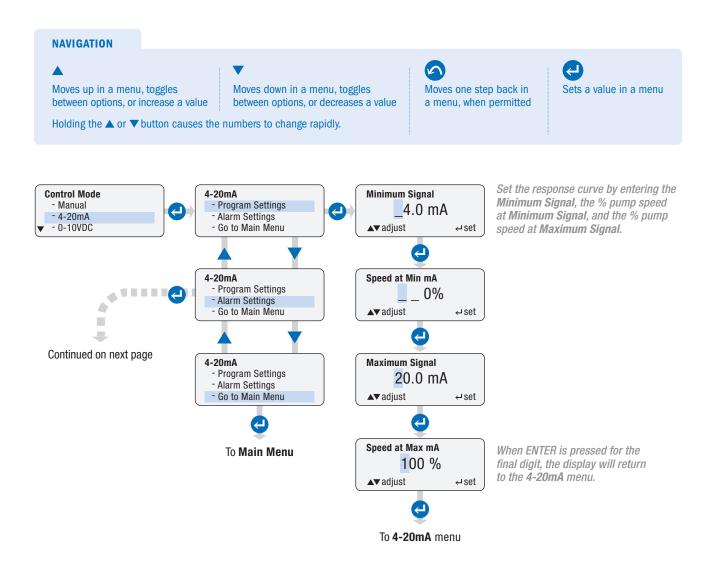


#### Diagram 3

Example of response curve with pump programmed to 25% speed at 5.0mA and 75% speed at 16.0mA.

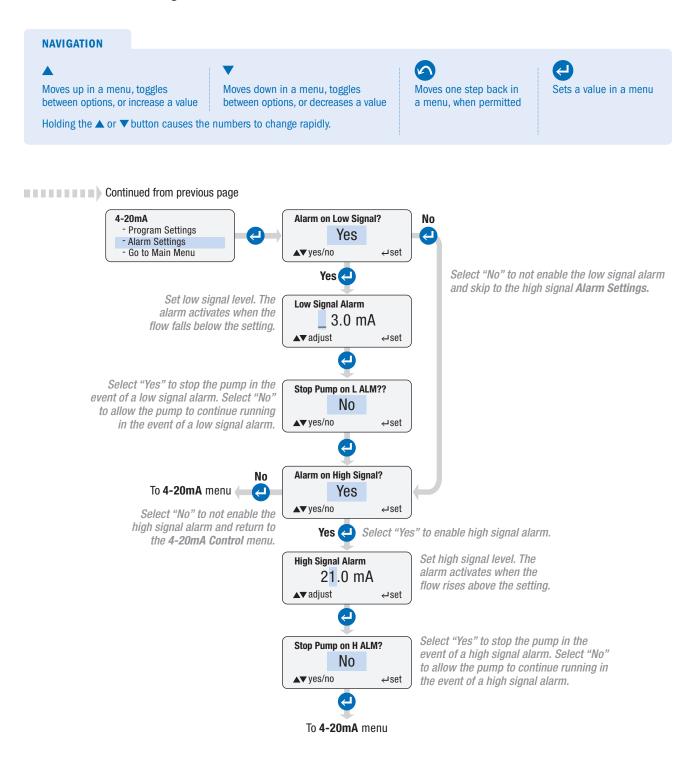
### 4-20mA page 2 of 3

To program the pump for 4-20mA control mode, set the response curve in **Program Settings**, return to the **4-20mA Control** menu and program the desired options under **Alarm Settings**, then exit to the **Main Menu** via the **Go To Main Menu** option.



### 4-20mA page 3 of 3

NOTE: Signal alarms are non-latching and will clear automatically when the signal returns to specified operating range. Alarms activate when settings are exceeded.



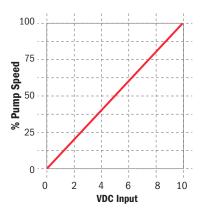
#### 0-10VDC page 1 of 3

Allows user to configure the pump to respond proportionally to a 0-10VDC analog signal. The pump's speed varies according to the level of the 0-10VDC signal. The response to the signal can be scaled or inverted (refer to Diagram 1, 2 & 3).

**A WARNING** When operating in an inverted response curve where the minimum signal is associated with the maximum pump speed, the pump will run at the maximum set speed if the signal is lost. It is extremely important to properly set the alarms to prevent overfeed on a loss of signal. The user must enter the minimum signal set point above zero (for example, 0.1VDC) so that a low signal alarm is enabled at OVDC.

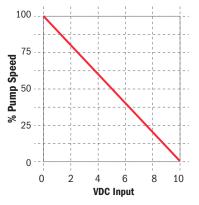
To customize the pump response, set the signal values and the pump speed percent for the high and low range of the signals (refer to Diagram 1).

The signal level and associated speed set points can be set to any level, as long as there is at least 1VDC difference between the minimum and maximum signal level and a 10% difference in the speed percent between the two points (refer to Diagram 3).



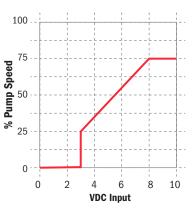
#### Diagram 1

Example of standard 0-10VDC response curve. Pump set to 0% speed @ 0.0VDC and 100% speed @ 10.0VDC.





Example of 10-0VDC inverted response curve. Pump set to 100% speed @ 0.0VDC and 0% speed @ 10.0 VDC.

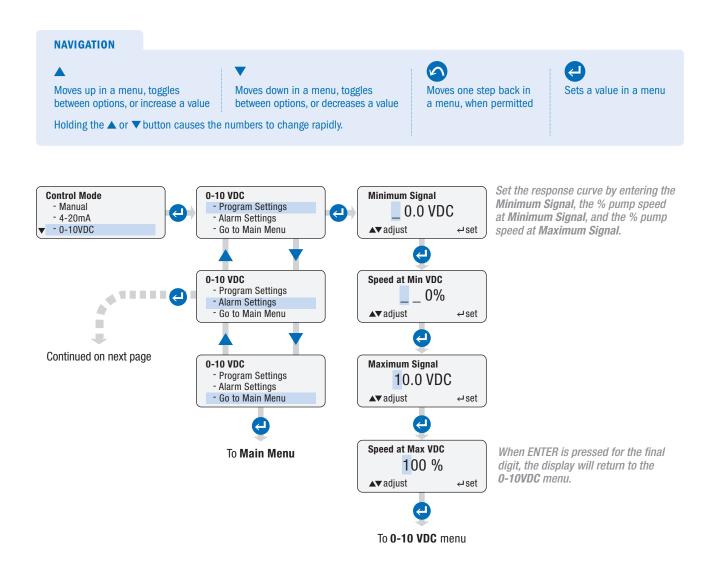


**Diagram 3** 

Example of response curve with pump set to 25% speed @ 3.0VDC and 75% speed @ 8.0VDC.

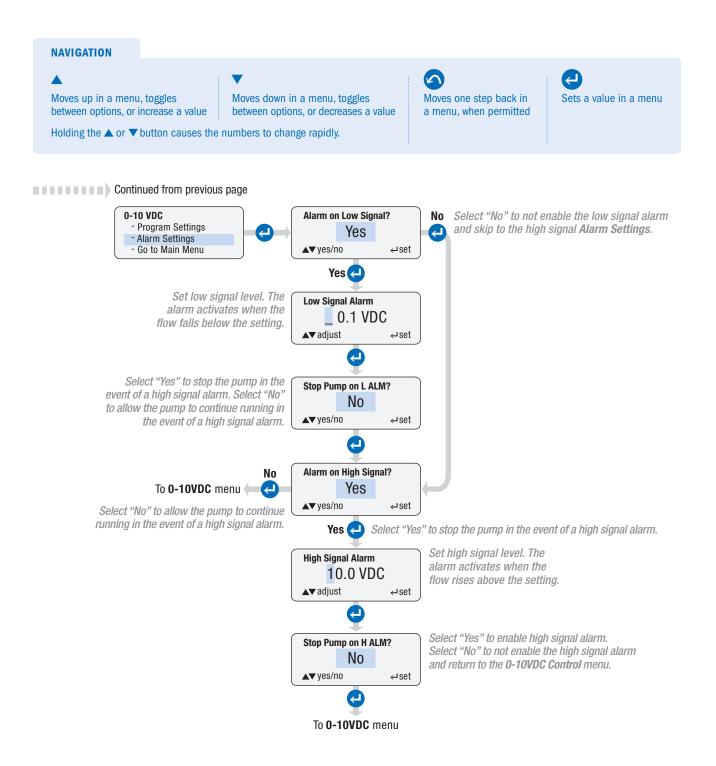
#### 0-10VDC page 2 of 3

To program the pump for 0-10VDC control mode, set the response curve in **Program Settings**, return to the **0-10VDC Control** menu and program the desired options under **Alarm Settings**, then exit to the **Main Menu** via the **Go To Main Menu** option.



#### 0-10VDC page 3 of 3

NOTE: Signal alarms are non-latching and will clear automatically when the signal returns to specified operating range. Alarms activate when settings are exceed.



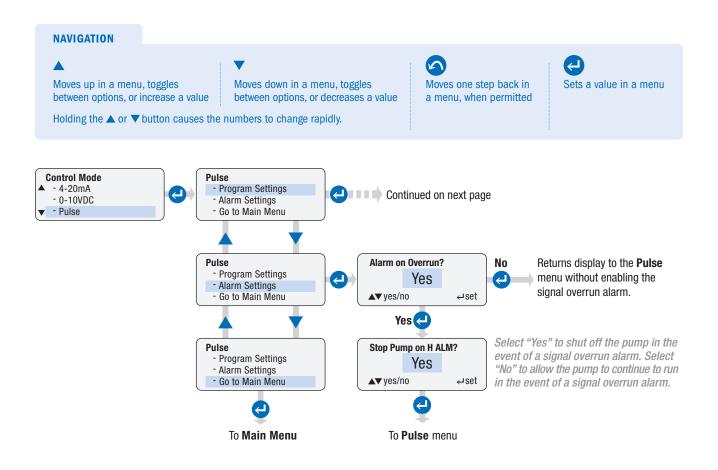
#### PULSE page 1 of 2

Allows user to configure the pump to run for a specified period of time when it receives a specified number of signals from a dry contact or an open collector input.

To program the pump for **Pulse** control mode, set the activation parameters in **Program Settings**, return to the **Pulse Control** menu and program the desired options under **Alarm Settings**, then exit to the **Main Menu** via the **Go To Main Menu** option.

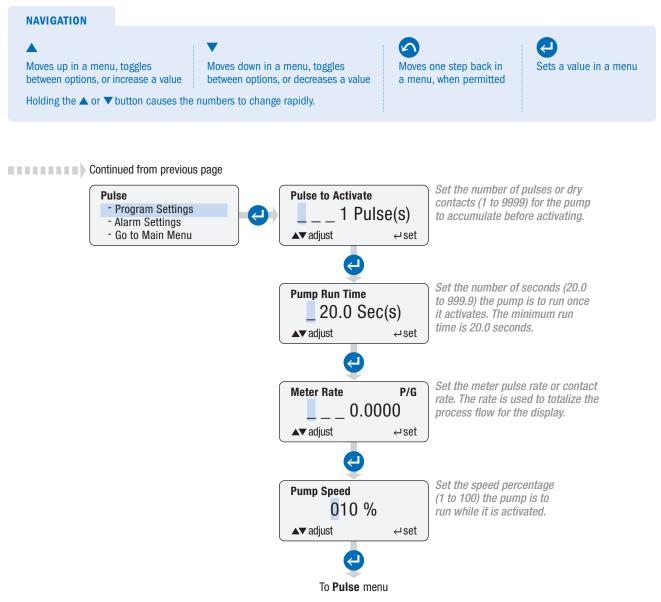
The minimum allowable run time is 20.0 seconds.

**CAUTION** A signal overrun occurs when the pump receives sufficient pulses to activate another run cycle while the pump is already in a run cycle. This means that the process flow is greater than what the program settings allow for. The pump will ignore an activation while it is in a run cycle. A signal overrun condition will lead to incorrect dosing.



#### PULSE page 2 of 2

The menu example illustrates **Units** in gallons. For liters, select **Liters** in the **Configuration** menu. When in **Control** mode, liters are represented by **P/L** on the display.



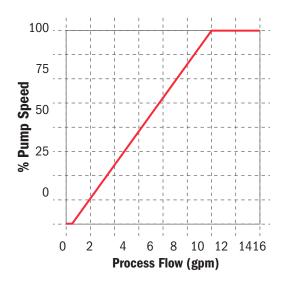
After settings are entered the display returns to the **Pulse** menu and **Alarm Settings** can be programmed.

#### HALL EFFECT page 1 of 3

Allows user to configure the pump to receive Hall Effect input signals (typically from paddlewheel or turbine flow meters). The pump's speed varies according to a Hall Effect input. The pump is programmed for the flow meter's K factor, process flow range and desired pump output.

The user sets the minimum and maximum process flow rates and the pump speed associated with those two rates, along with the K factor for the meter that is providing the input. The pump will then automatically vary its speed to maintain a dosing proportional to flow based on the input range.

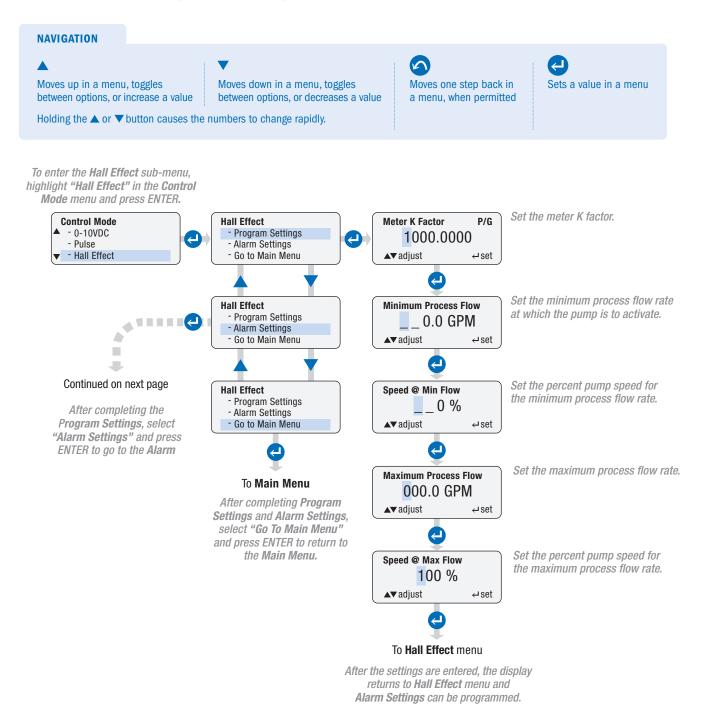
For example, the pump response curve below is for a pump speed of 0% at a minimum process flow of 0.5 gpm and a pump speed of 100% at a maximum process flow rate of 12 gpm.



- The pump provides +12VDC to the meter.
- · The meter's K factor (pulses per unit of volume) is specified by the meter manufacturer.
- Typically, the meter manufacturer will specify a minimum flow rate for the meter. It is recommended the pump minimum process flow rate setting is not set below this point.

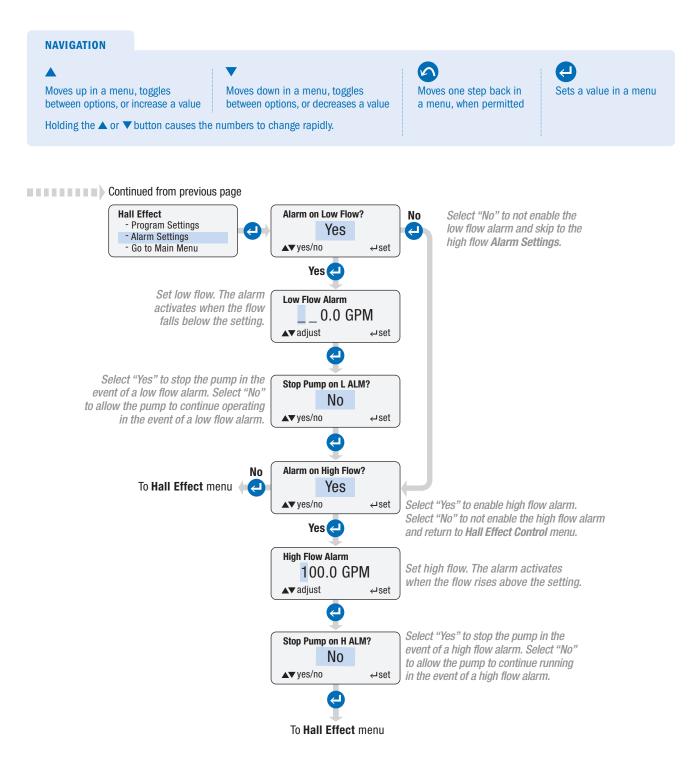
#### HALL EFFECT page 2 of 3

The menu example illustrates **Units** in gallons. For liters, select **Liters** in the **Configuration** menu. When in **Control** mode, liters are represented by **P/L** on the display.



#### HALL EFFECT page 3 of 3

**A CAUTION** A process flow that exceeds the maximum programmed flow rate will lead to incorrect dosing. It is recommended that the user set the high flow alarm. Alarms activate when settings are exceeded.



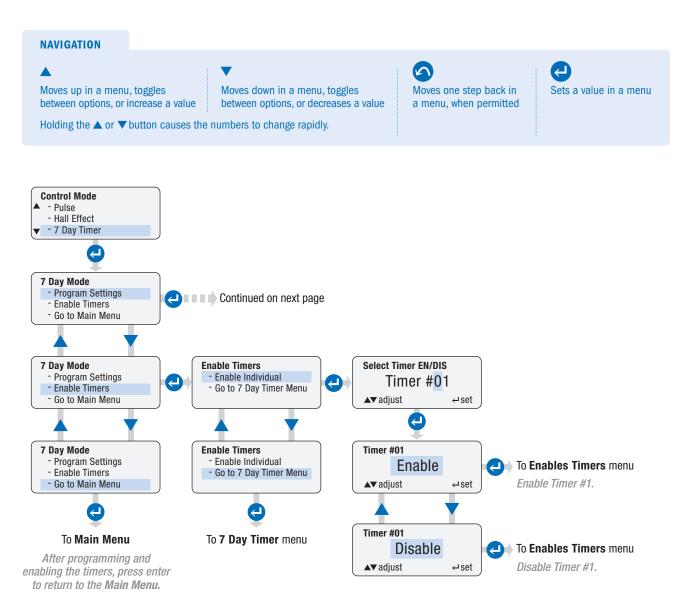
# CONFIGURATION MENU continued

#### 7 DAY TIMER page 1 of 3

Allows user to program the pump to turn on and turn off at specific times and specific days. The pump operates with a 24 hour clock format.

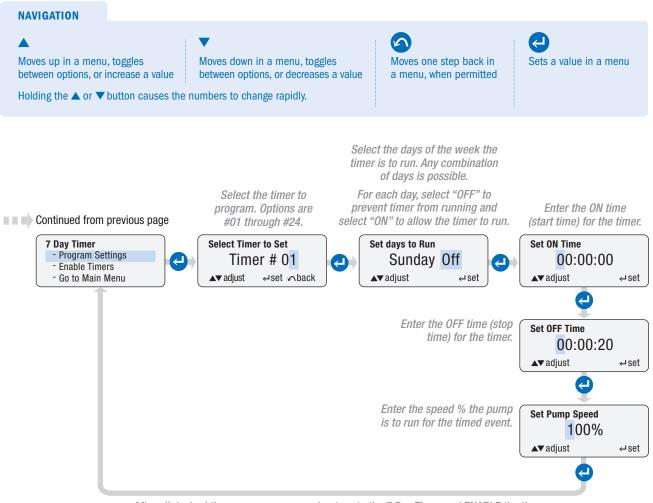
- · There are 24 independent time events. Each event is individually programmable through timers #01 #24.
- Each timer can be programmed:
  - For any combination of days
  - To run from a minimum of 20 seconds to a maximum of 23 hours, 59 minutes, and 59 seconds
  - To run at a speed from 1% to 100%
- Each programmed event is contained within 24 hours (from 00:00:00 to 23:59:59). The time for an event cannot exceed 23:59:59.
- · By default, all timers are disabled. After programming a timer, it must be enabled in order to run.
- Only programmed timers can be enabled.
- The user can return at any time to the 7 Day Timer menu and individually enable or disable the timers to customize their timer events.
- The pump uses a battery to maintain the clock when power is removed.
- · The timer programs entered by the user are stored in non-volatile memory.

#### 7 DAY TIMER page 2 of 3



#### 7 Day Timer page 3 of 3

The timer utilizes a 24 hour format.



After all desired timers are programmed, return to the 7 Day Timer and ENABLE the timers.

#### PPM FEED page 1 of 6

Allows user to configure the pump to automatically dose a specific ppm of solution into the process flow.

PPM feed has two options: Constant Flow, Flow Switch and Variable Flow, Hall Effect.

**Constant Flow, Flow Switch**: The Constant Flow, Flow Switch option is used with process systems with a constant flow. The pump accepts a dry contact or an open collector signal to trigger the pump.

Program the pump with the:

- · Process flow rate (GPM or LPM selected in the Units submenu of Configuration)
- · Chemical concentration %
- · Desired PPM dosing rate of the chemical

The pump uses the following equations to calculate the required speed:

· In GPD

 Pump Output Required (GPD) =

 Process GPM × Feed Rate PPM X 1440
 Chemical Concentration % × 10,000 × Specific Gravity

 Pump Speed (%) =

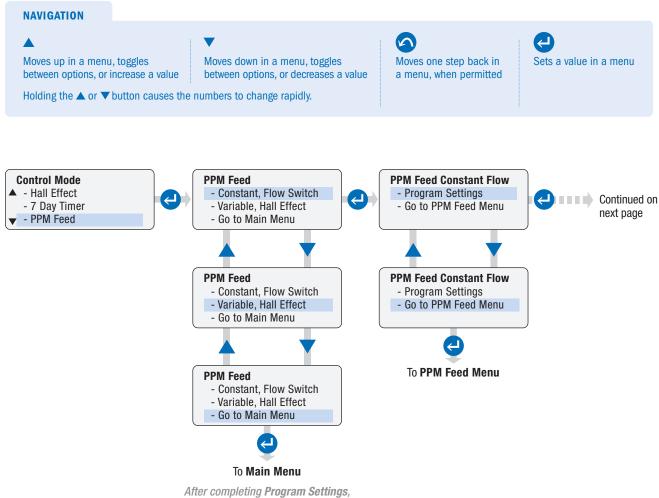
 Pump Output Required (GPD) × 100
 Max Pump Flow (GPD)

· In LPD

Pump Output Required (LPD) = $\frac{\text{Process LPM} \times \text{Feed Rate PPM X 1440}}{\text{Chemical Concentration \% \times 10,000 \times Specific Gravity}}$ Pump Speed (%) = $\frac{\text{Pump Output Required (LPD) \times 100}}{\text{Max Pump Flow (LPD)}}$ 

· When the pump receives an input signal, it runs at the speed calculated to dose the PPM level programmed.

#### PPM FEED - CONSTANT FLOW, FLOW SWITCH page 2 of 6

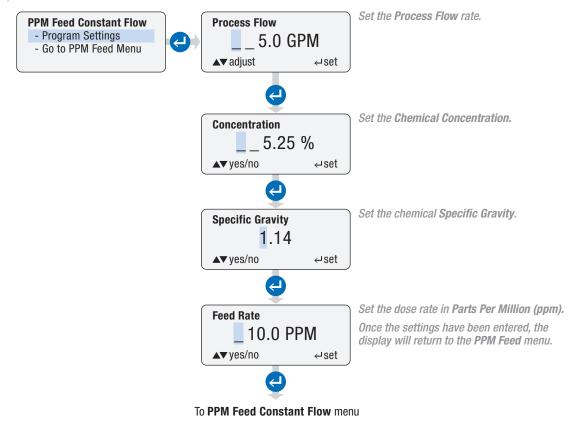


After completing **Program Settings**, select "Go To Main Menu" and press ENTER to return to the Main Menu.

#### PPM FEED - CONSTANT FLOW, FLOW SWITCH page 3 of 6



#### Continued from previous page



#### PPM FEED - VARIABLE FLOW, HALL EFFECT page 4 of 6

The Variable Flow, Hall Effect option is used with process systems with a variable flow. The pump accepts a hall effect input from a flow meter (typically, a paddlewheel or turbine type meter).

Program the pump with the:

- · Meter K factor
- · Process minimum and maximum flow rate (GPM or LPM selected in the Units submenu of Configuration)
- · Chemical concentration %
- · Specific gravity of the chemical
- · Desired PPM dosing rate of the chemical

The pump uses the following equations to calculate the required speed:

· In GPD

 Pump Output Required (GPD) =
 Process GPM × Feed Rate PPM X 1440

 Chemical Concentration % × 10,000 × Specific Gravity

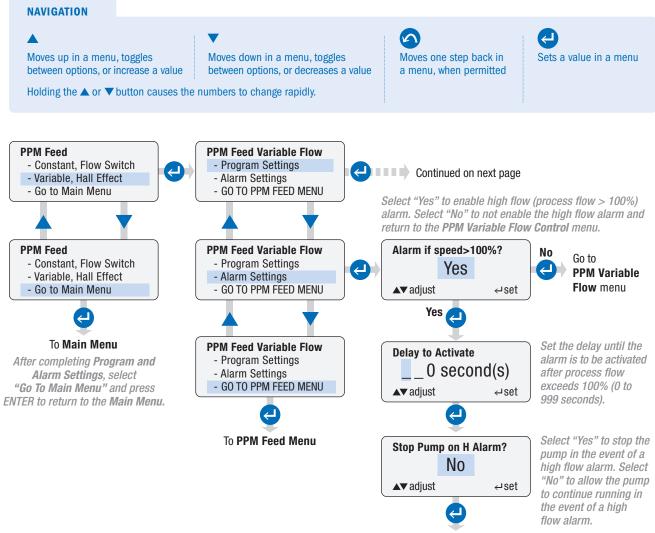
 Pump Speed (%) =
 Pump Output Required (GPD) × 100 Max Pump Flow (GPD)

· In LPD

Pump Output Required (LPD) = $\frac{\text{Process LPM \times Feed Rate PPM X 1440}}{\text{Chemical Concentration \% \times 10,000 \times Specific Gravity}}$ Pump Speed (%) = $\frac{\text{Pump Output Required (LPD) \times 100}}{\text{Max Pump Flow (LPD)}}$ 

### PPM FEED - VARIABLE FLOW, HALL EFFECT page 5 of 6

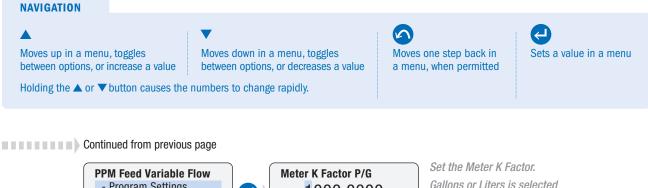
**A CAUTION** A process flow that exceeds the maximum programmed flow rate will lead to incorrect dosing. It is recommended to the high flow alarm. Alarms activate when settings are exceeded.

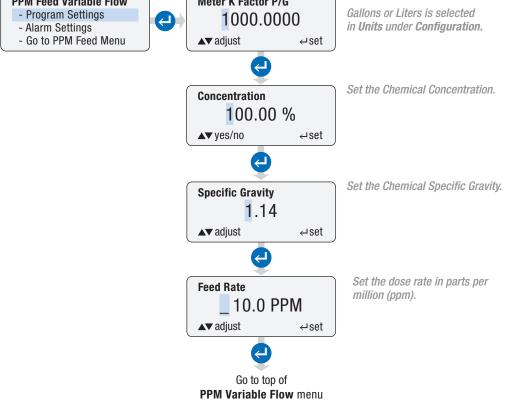


Go to PPM Variable Flow menu

#### PPM FEED - VARIABLE FLOW, HALL EFFECT page 6 of 6

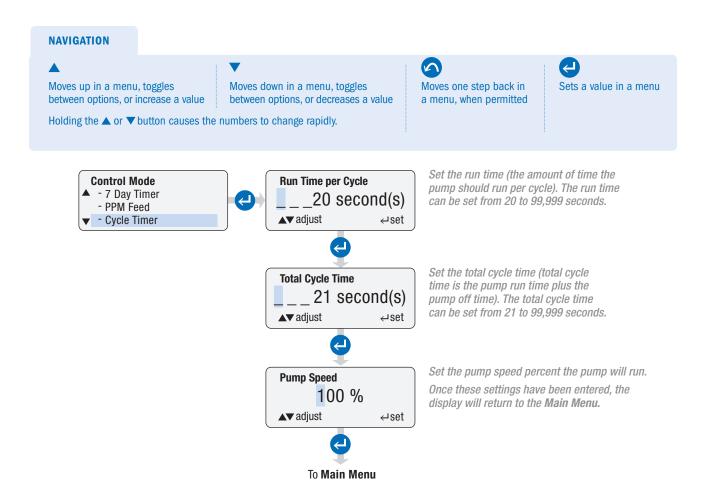
- The pump provides +12VDC to the meter.
- · The meter's K factor (pulses per unit of volume) is specified by the meter manufacturer.
- Typically, the meter manufacturer specifies a minimum flow rate for the meter. The pump minimum process flow rate setting should not be set below the meter manufacturer's recommendation.





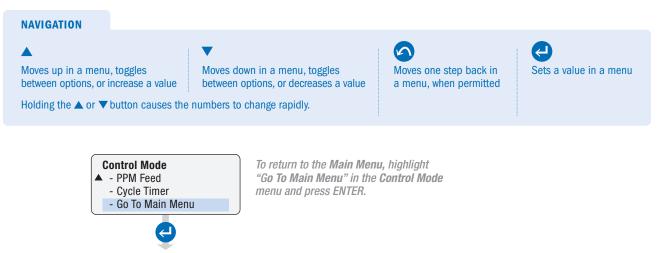
#### **CYCLE TIMER**

Allows user to configure a run time and off time cycle that the pump will continuously repeat.



#### **GO TO MAIN MENU**

Allows user to return to Main Menu.



To Main Menu

# **OPERATING DISPLAY**

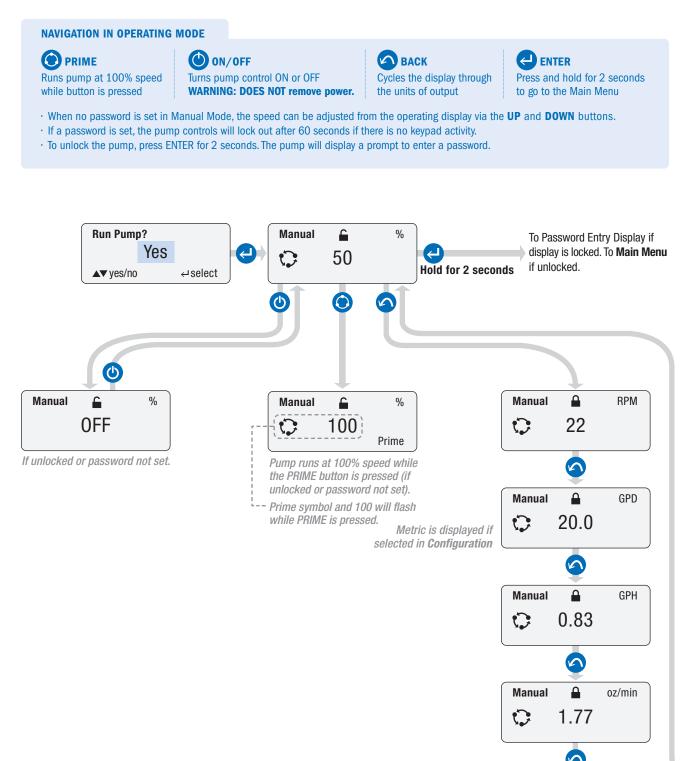
After selecting **"Run Pump**" in the **Main Menu** and pressing ENTER, the pump will go into operating mode and start running based on the programmed settings.

- · If a password is set, the pump controls will lock out after 60 seconds if there is no keypad activity.
- · To unlock the pump, press ENTER for 2 seconds. The pump will display a prompt to enter a password.

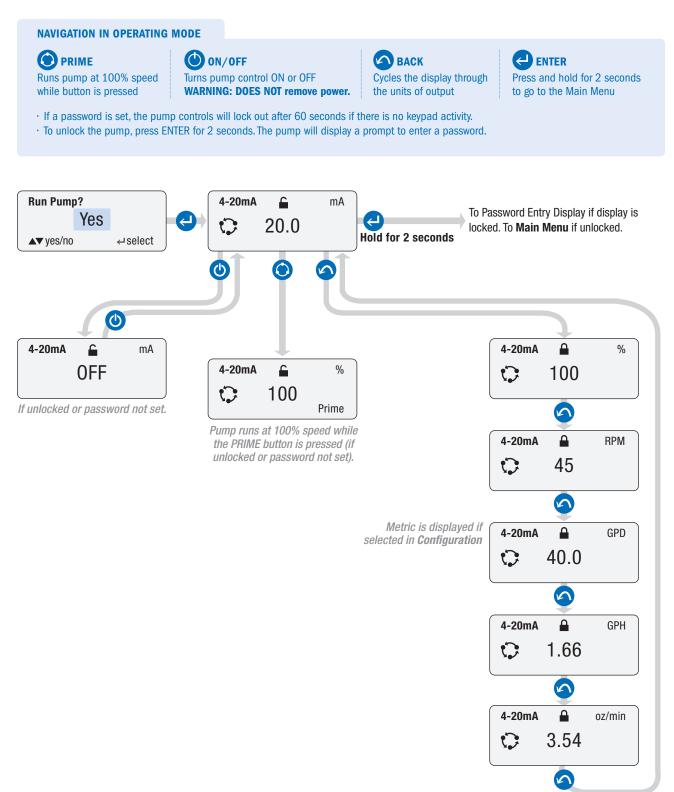
In operating mode, the following functions are available when the pump is unlocked or no password is set:

Button		Operating Mode Function
	UP	Increases the speed percent in the Manual mode
$\nabla$	DOWN	Decreases the speed percent in the Manual mode
$\odot$	PRIME	Runs pump at 100% speed while button is pressed
Ċ	ON/OFF	Turns pump control ON or OFF WARNING: DOES NOT REMOVE POWER
5	BACK	Cycles the display to show different units of output
ł	ENTER	Press and hold for 2 seconds to go to the Main Menu

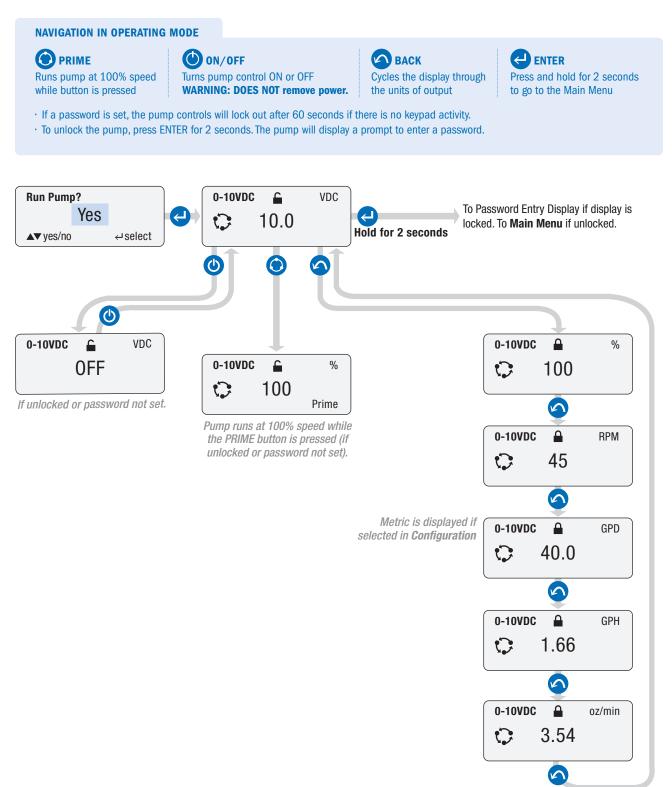
#### MANUAL



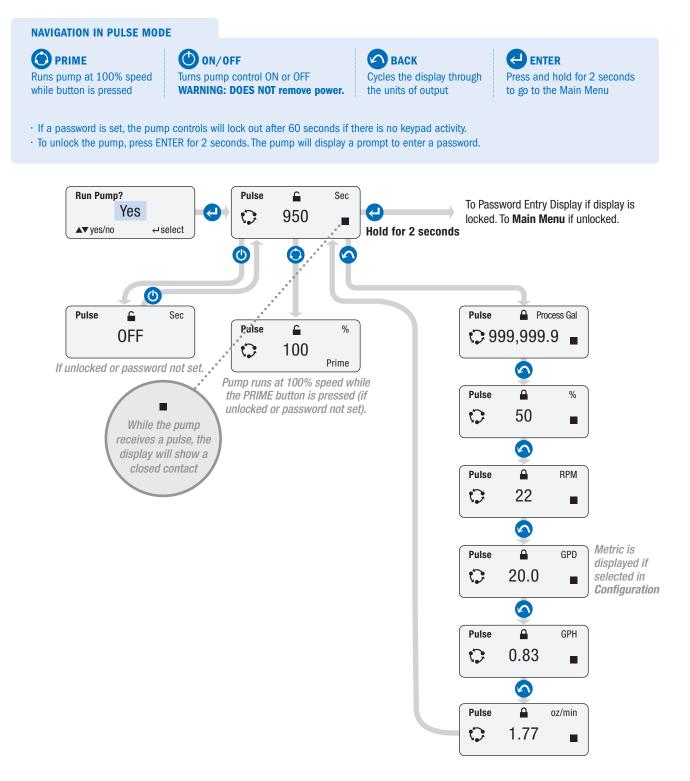
#### 4-20mA



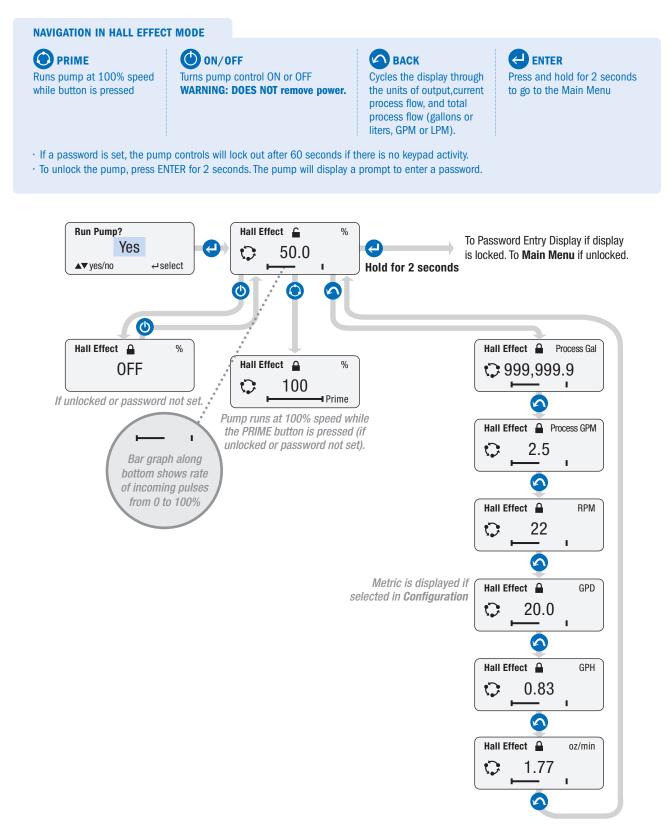
### 0-10VDC



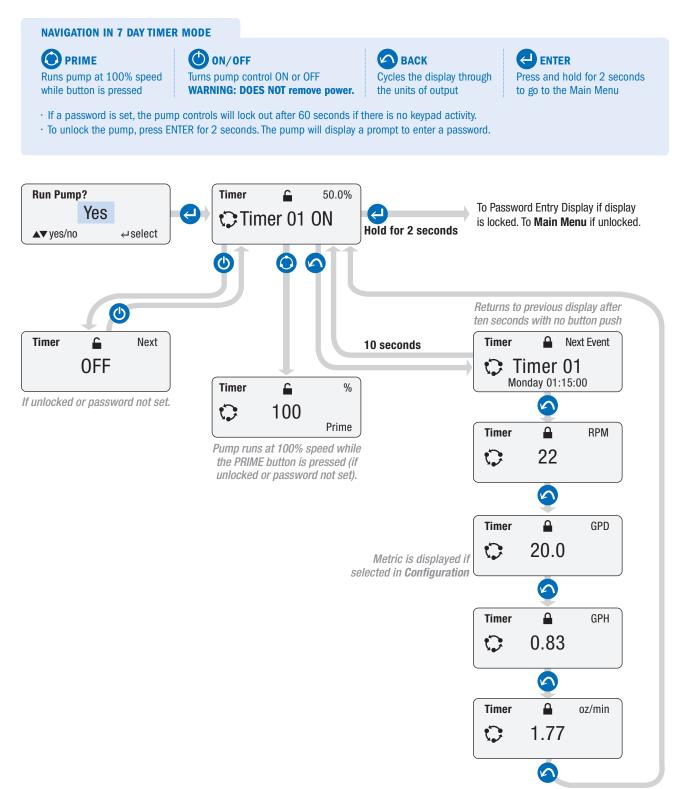
### **PULSE**



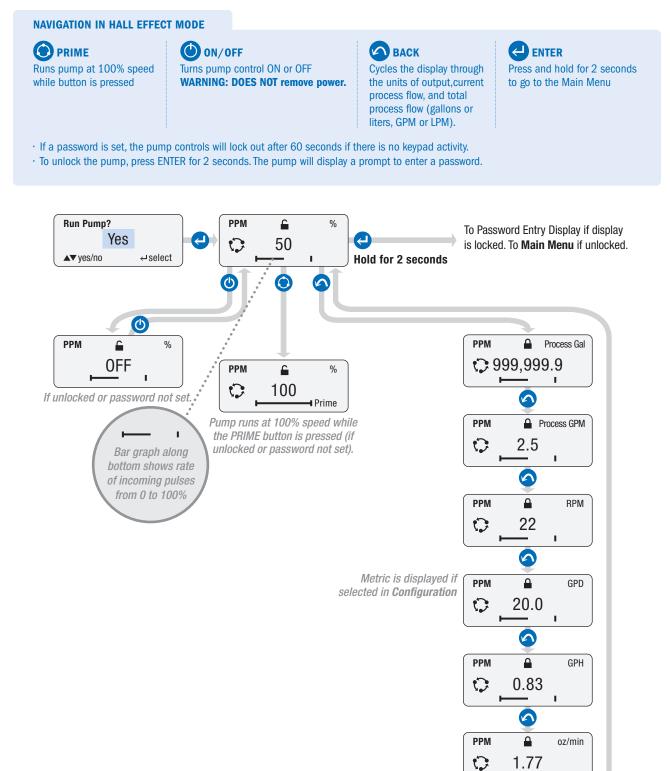
### HALL EFFECT



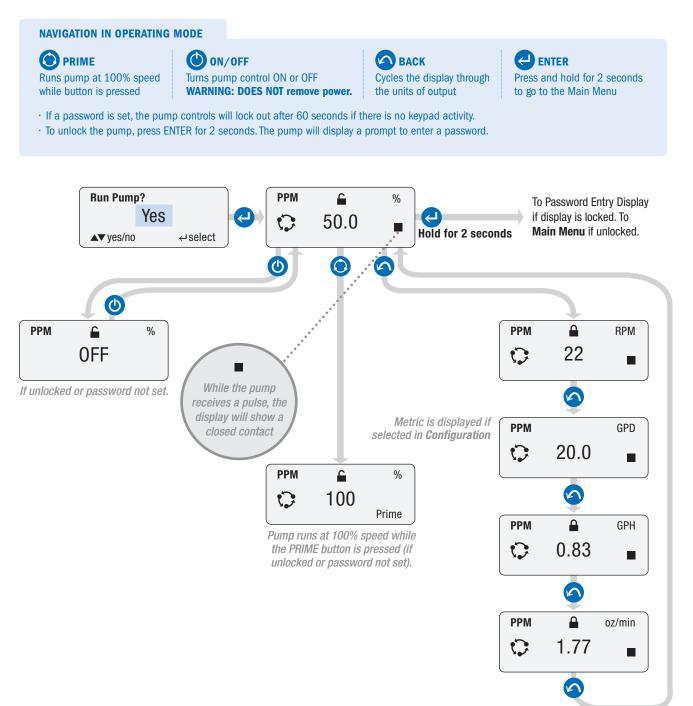
#### **7 DAY TIMER**



#### **PPM FEED, VARIABLE FLOW**



#### **PPM FEED, CONSTANT FLOW**



### **CYCLE TIMER**

#### **NAVIGATION IN OPERATING MODE** PRIME ூ ON/OFF BACK ENTER Runs pump at 100% speed Turns pump control ON or OFF Cycles the display through Press and hold for 2 seconds while button is pressed WARNING: DOES NOT remove power. the units of output to go to the Main Menu · If a password is set, the pump controls will lock out after 60 seconds if there is no keypad activity. • To unlock the pump, press ENTER for 2 seconds. The pump will display a prompt to enter a password. Display counts down seconds to next run. ۵ CYCLE SEC 999 Display counts down seconds when running CYCLE **Run Pump?** SEC £ To Password Entry Display if display Yes **(2**) (പ $\bigcirc$ 950.0 is locked. To Main Menu if unlocked. Hold for 2 seconds ⇔select ▲▼ yes/no $\bigcirc$ (') 5 0 CYCLE £ SEC CYCLE % **OFF** CYCLE £ % 50 $\mathbb{C}$ 0 100 Prime If unlocked or 5 password not set. Pump runs at 100% speed while CYCLE RPM the PRIME button is pressed (if unlocked or password not set). $\bigcirc$ 22 5 Metric is displayed if CYCLE GPD selected in Configuration 20.0 $\bigcirc$ 3 CYCLE GPH 0.83

 $\bigcirc$ 

CYCLE

 $\mathbf{C}$ 

5

1.77

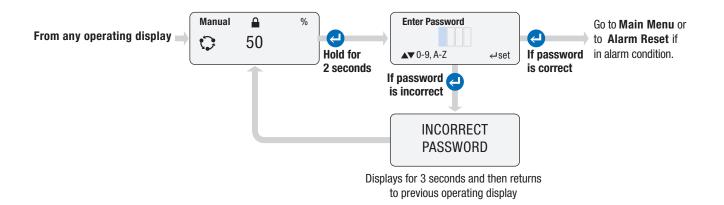
5

oz/min

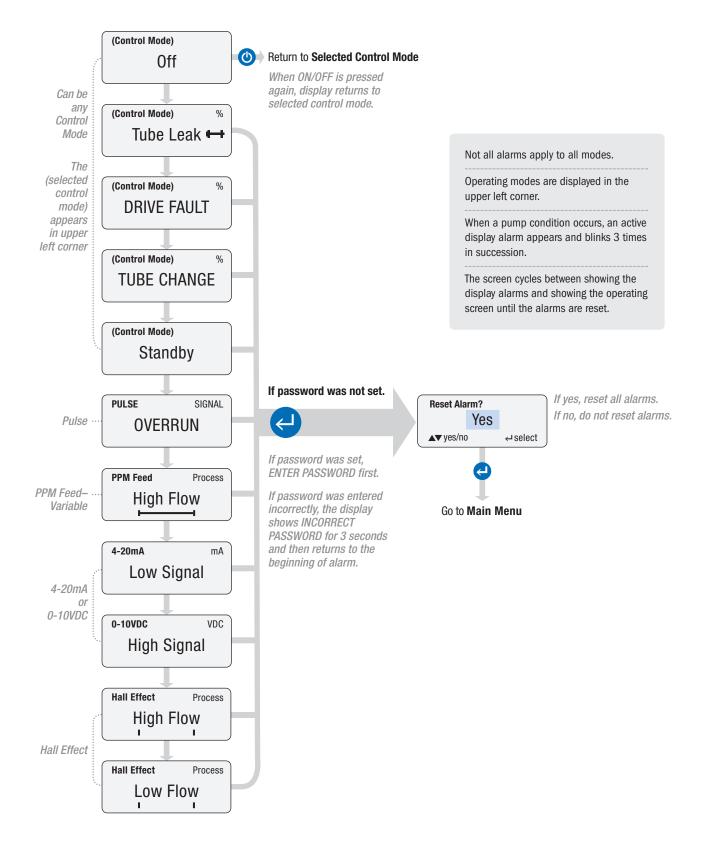
### **ENTER PASSWORD**



This example shows the MANUAL operating display. The password steps are the same from any operating display.



### **DISPLAY ALARMS**



# CONNECTIONS

#### **USER INTERFACE CONNECTIONS**

The input and output connection terminals are located at the rear of the pump. To access it, unplug the pump and remove the signal cover by taking out the Phillips head screws that secure it in place.

Prepare the signal cable by removing 3.5" of the outer jacket. Bare 1/4" on the ends of the signal wires. See cautionary note below on wire approval, shielding, size, etc.

Loosen the outer nuts on the liquid tight cord grips. Remove rubber plug from the cord grip.

Insert a sufficient length of signal cable through the cord grip to allow for wiring.

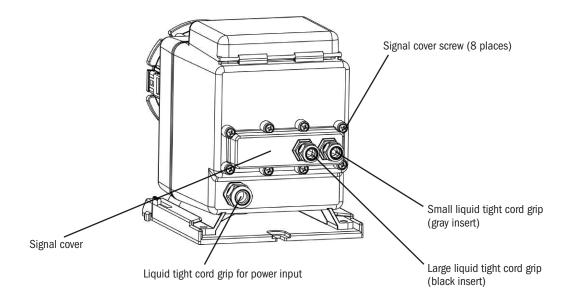
Make connections as required.

Adjust signal cable so that the outer jacket is flush with the inside of the cord grip. Tighten the cord grip nut flush with the cord grip body.

Replace signal cover, ensuring that the signal wires do not get pinched between the signal cover and pump body.

Replace the signal cover screws, using care to find existing threads, and tighten until the signal cover is evenly and fully tightened down flush.

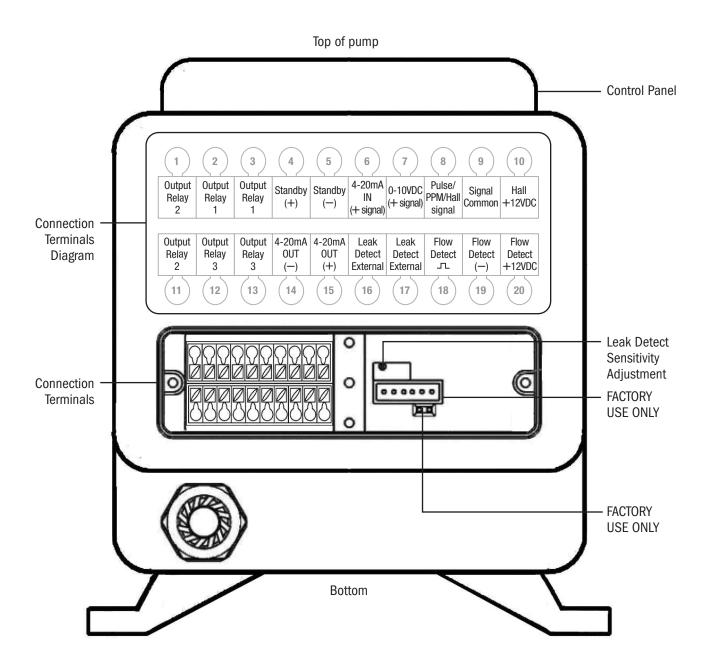
A WARNING Failure to properly tighten or secure the cord grip or signal cover may allow water to enter the pump enclosure, which can cause pump failure, property damage, or personal injury.



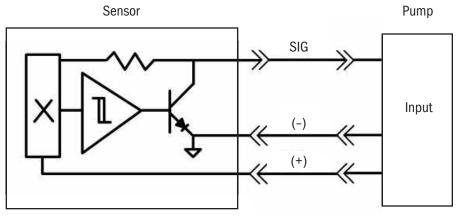
**CAUTION** Signal cables must be UL, cUL AWM Style 2464 approved with conductors between 28 AWG and 18 AWG. Jacket diameter for small liquid tight must be 0.064" to 0.210". Jacket diameter for large liquid tight must be 0.114" to 0.250".

### **REAR OF THE PUMP WITH SIGNAL COVER REMOVED**

- **CAUTION** If connecting a shielded signal cable to the pump signal cable, ensure that the shield wire is properly grounded on the controller (non-pump) side.
- **A CAUTION** DO NOT run signal wires in proximity to high voltage wires.



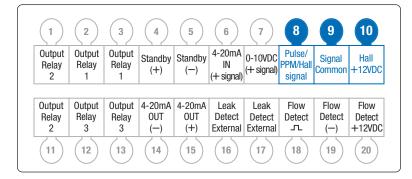
### HALL EFFECT OR PPM VARIABLE FEED



Hall Effect Output

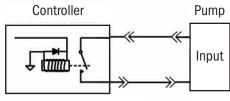
#### **Connection Terminals**

- · Connect meter positive input to Hall+12VDC, position #10 on the top row.
- · Connect meter common to Signal Common, position #9 on the top row.
- · Connect meter signal to Pulse/PPM/Hall signal, position #8 on the top row.

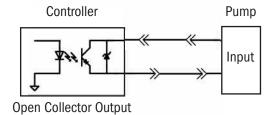


▲ **CAUTION** The 12VDC supply from connection #10 is limited to 20mA and is only for powering Hall Effect sensors on turbine or paddlewheel type flow meters. Do not use the 12VDC output for anything else; otherwise, damage to the pump will occur.

### **PULSE OR PPM CONSTANT FEED**



Dry Contact Relay Output



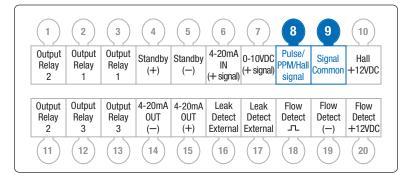
#### **Connection Terminals**

#### For connection to a Dry Contact

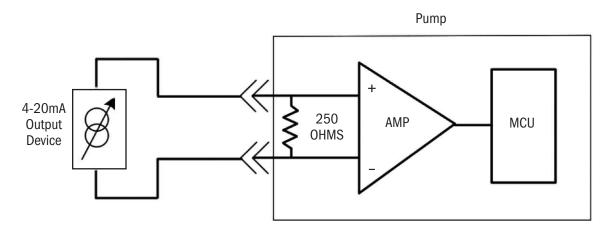
- · There is no polarity to observe.
- · Connect dry contact relay to Pulse/PPM/Hall signal, position #8 and Signal Common, position #9 on the top row.

#### For connection to an Open Collector output

- · Polarity must be observed.
- · Connect OC positive to Pulse/PPM/Hall signal, position #8 on the top row.
- Connect OC common to Signal Common, position #9 on the top row.



### 4-20mA INPUT



Pump signal impedance is 250 ohms.

 $\underline{\wedge}$  **A CAUTION** Maximum voltage on the signal line is 36VDC.

#### **Connection Terminals**

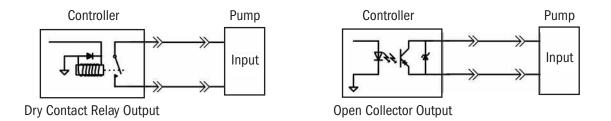
- · Connect signal positive input to 4-20mA IN (+ signal), position #6 on the top row.
- · Connect signal common to Signal Common, position #9 on the top row.

	2	3	4	5	6	(7)	8	9	(10)
Output Relay 2	Output Relay 1	Output Relay 1	Standby (+)	Standby (—)	4-20mA IN (+ signal)	0-10VDC (+ signal)	Pulse/ PPM/Hall signal	Signal Common	Hall +12VDC
Output Relay 2	Output Relay 3	Output Relay 3	4-20mA 0UT (—)	4-20mA 0UT (+)	Leak Detect External	Leak Detect External	Flow Detect	Flow Detect (—)	Flow Detect +12VDC
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	20

## **STANDBY**

The STANDBY function allows for the pump to be stopped remotely. If a dry contact or open collector signal is received to the STANDBY inputs, the pump will cease operation as long as the signal is present. The pump will also flash "STANDBY" on the operating display.

NOTE: The STANDBY function can be used to transfer operation to a secondary pump in the event of a primary pump failure. An output relay on the primary pump is programmed for TRANSER and Normally Closed. This relay provides an input to the STANDBY function of the secondary pump, which is programmed identically to the primary pump. In the event of a loss of power or an alarm event that shuts down the primary pump, the output relay on the primary pump opens and activates the secondary pump.



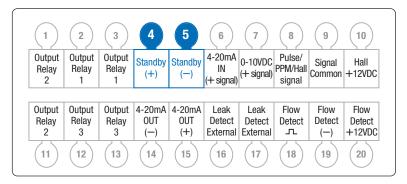
#### **Connection Terminals**

#### For connection to a Dry Contact

- There is no polarity to observe.
- · Connect relay to Standby (+), position #4 and Standby (-), position #5 on the top row.

#### For connection to an Open Collector output

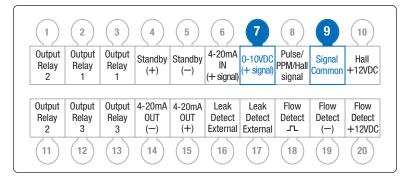
- · Polarity must be observed.
- Connect OC positive to Standby (+), position #4 on the top row.
- Connect OC common to Standby (-), position #5 on the top row.



## 0-10VDC

#### **Connection Terminals**

- · Connect signal positive input to 0-10VDC (+ signal), position #7 on the top row.
- · Connect signal common to Signal Common, position #9 on the top row.



### **OUTPUT RELAYS**

#### **Connection Terminals**

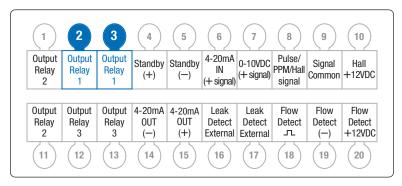
The relays are dry contacts, so there is no polarity to observe.

NOTE: The output relays are Normally Open.

**A CAUTION** The output replays are for signal level only. Max rating is for 24VDC at 50mA.

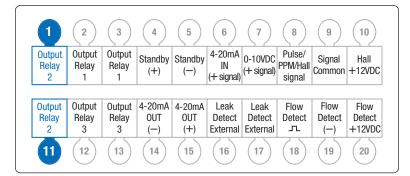
#### **Output Relay #1**

Connect to Output Relay 1 in positions #2 & #3 on the top row.



#### **Output Relay #2**

Connect to Output Relay 2 in positions #1 on the top row and #11 on the bottom row.



#### **Output Relay #3**

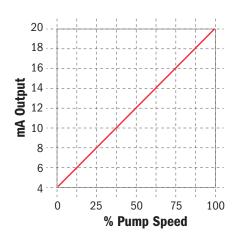
Connect to Output Relay 3 in positions #12 and #13 on the bottom row.

	2	3	4	5	6	(7)	8	9	(10)
Output Relay 2	Output Relay 1	Output Relay 1	Standby (+)	Standby (—)	4-20mA IN (+ signal)	0-10VDC (+ signal)	Pulse/ PPM/Hall signal	Signal Common	Hall +12VDC
									_
Output Relay	Output Relay	Output Relay	4-20mA 0UT	4-20mA OUT	Leak Detect	Leak Detect	Flow Detect	Flow Detect	Flow Detect
2	3	3	(-)	(+)	External		л	()	+12VDC
(11)	12	13	(14)	(15)	(16)	(17)	(18)	(19)	20

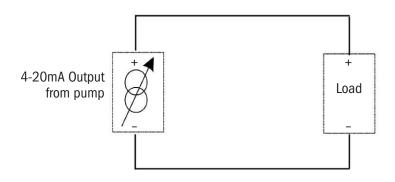
75

## 4-20mA OUTPUT page 1 of 2

The pump is equipped with a 4-20 mA output signal.



This signal corresponds proportionally to pump speed with 0% pump speed equaling 4.0mA and 100% pump speed equaling 20.0mA. The signal response is not adjustable by the user.



The pump sources the voltage for the output signal loop at 24VDC. The pump will control the magnitude of current on the loop (from 4 to 20mA) according to the speed that the pump is running at. The maximum loop impedance (load on the output signal loop) is 300 ohms, which includes the load plus any resistance due wire length, connections, etc.

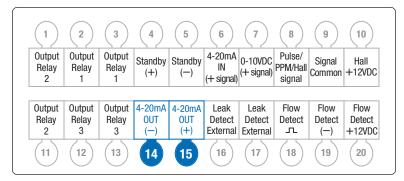
**A CAUTION** The loop impedance must be less than 300 ohms.

A CAUTION Do not short the 4-20mA output loop. Doing so will cause the pump to shut off and may damage the pump.

A CAUTION To ensure proper signal output, always calibrate the output signal.

#### **Connection Terminals**

- · Connect load positive to 4-20mA OUT (+), position #15 on the bottom row.
- · Connect load common to 4-20mA OUT (-), position #14 on the bottom row.



## 4-20mA OUTPUT page 2 of 2

#### CALIBRATING 4-20mA OUTPUT

The 4-20mA output will produce a signal that corresponds to the speed percentage that the pump is running (4mA=0% pump speed & 20mA=100% pump speed).

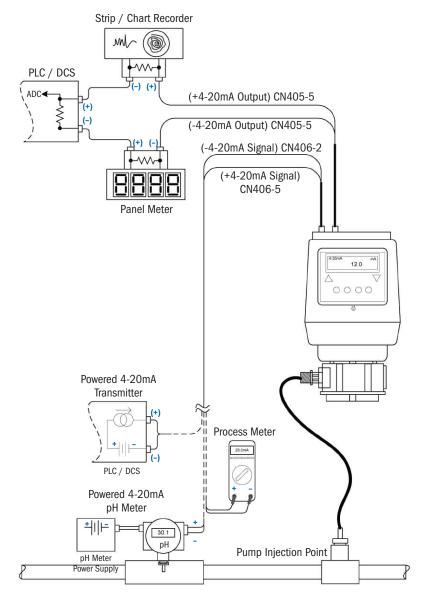
To calibrate the output loop – navigate to the signal calibration selection in the configuration menu – with the pump installed – place a process or a multimeter in the loop.

NOTE: When entering this menu the output is activated only when the value is changed by pressing the up or down arrows.

Adjust the value in the "4mA out set" menu to indicate 4mA in the process loop and press enter. this is the zero adjustment parameter.

Next adjust the value in the "20mA out set" menu to indicate 20mA in the process loop and press enter. this is the span adjustment parameter.

Go to manual mode. set the pump speed at 100%. note the difference between the current loop value and 20mA – return to the output signal calibration menu and readjust (add or subtract) the output level by the difference noted. Verify the process loop by setting the pumps speed to 25%, 50%, & 75%. the loop current should be 8mA, 12mA, & 16mA respectively.



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## LEAK DETECT page 1 of 3

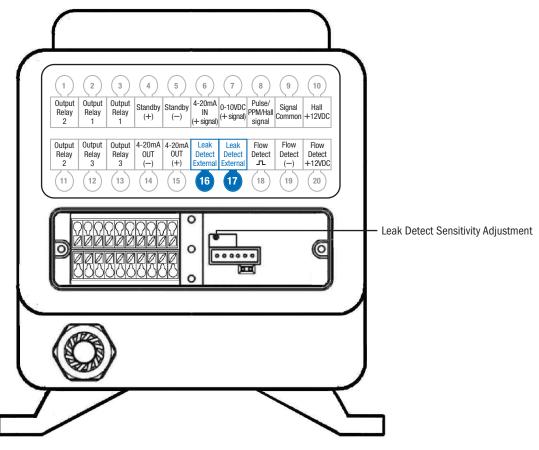
The S Series pump includes a highly sensitive leak detector. The detector can differentiate between a tube rupture leak and water intrusion. The sensitivity feature reduces the number of false "tube leak" signals due to the pump's location in a wet environment, outdoors or if subject to hose down cleaning.

#### **AWARNING** TO BE INSTALLED AND MAINTAINED BY PROPERLY TRAINED PROFESSIONAL INSTALLER ONLY. READ MANUAL & LABELS FOR ALL SAFETY INFORMATION & INSTRUCTIONS.

**ACAUTION** Turn off water system, disable all pumps and depressurize the system before performing installation. Always wear proper protective safety equipment when working with metering pumps.

- Field calibration of the pump in the application assures the "tube leak" signal represents the application's chemical and concentration.
- Refer to Configuration Menu section in the pump manual to select, fine-tune and program the responses available when a "tube leak" signal is received.
- The leak detect sensitivity is factory pre-set to distinguish between water and typical water treatment chemicals. Adjust the sensitivity according to the specific chemical utilized in the application. Adjust with the potentiometer located under the signal cover, see below.
- When using external leak detect probes (not included with pump), connect to Leak Detect External, positions #16 and #17 on the bottom row of the terminal on rear of the pump. The probes can monitor leakage in areas other than the pump head. The probes should be constructed of Hastelloy<sup>®</sup> to inhibit corrosion.

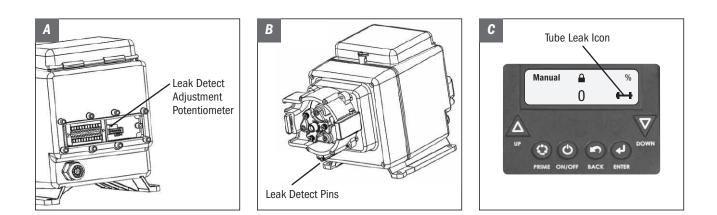
NOTE: The leak detect function has one sensitivity adjustment. When external probes are used, confirm the sensitivity setting is acceptable for the probes and liquid end.



### LEAK DETECT page 2 of 3

#### CALIBRATE THE LEAK DETECT SENSITIVITY

- 1. In the Configuration Menu, verify that "Alarm on Tube leak" is set to NO.
- 2. Set the pump to MANUAL mode at 0%.
- 3. Unplug the pump.
- 4. Remove tube housing cover.
- 5. Remove the signal cover to allow access to the leak detect adjustment potentiometer, Illustration A.
- 6. Plug the pump in.
- 7. Soak a small piece of sponge with the pumping solution and place over the two leak detect pins, *Illustration B.* In this step, use the expected weakest solution and keep in mind some solutions dilute with time.
- 8. Observe whether the tube leak icon is shown on the display, Illustration C.
  - If yes, use a small flat blade screwdriver less than 3 mm and slowly turn the leak detect potentiometer clockwise, Illustration A, until the tube leak icon is not displayed, then proceed to step 9.
  - If the pump does not display the tube leak icon, proceed to step 9.



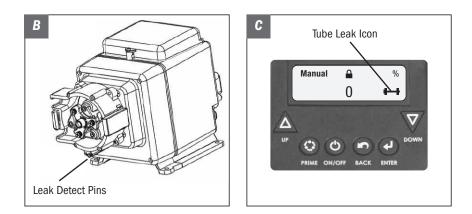
### LEAK DETECT page 3 of 3

#### CALIBRATE THE LEAK DETECT SENSITIVITY

- 9. Use a small flat blade screwdriver less than 3 mm and slowly turn the potentiometer counterclockwise until the tube leak icon is visible and not flickering, Illustration C. Turn slightly past this point to ensure a solid tube leak icon is shown.
- 10. Thoroughly clean the solution off the pins and confirm they are dry, *Illustration B*. Confirm the tube leak icon is not displayed.

**IMPORTANT:** Confirm there is no chemical residue remaining on the leak detect pins and bracket, Illustration B.

- 11. If the pump is not outdoors or exposed to water, go to Reassembly.
- 12. If the pump will be installed outdoors or exposed to water:
  - Soak a small piece of sponge in water and place over the two leak detect pins, *Illustration B*. If the tube leak icon displays, *Illustration C*, it indicates the conductivity of the pumped solution and water is too close and the pump cannot discriminate between the two. The liquid end needs to be protected from water intrusion to avoid a false tube leak signal.
  - If the tube leak icon does not show, the setting is complete.
- 13. Re-install the tube housing cover and the signal cover on the pump.
- 14. Prime the pump, enable leak detect and set the mode of operation.
- 15. Verify pump operation.



## **INSTALLATION**

## **ADDITIONAL SAFETY INSTRUCTIONS**

NOTICE: Indicates special instructions or general mandatory action.

Read all safety hazards before installing or servicing the pump. The pump is designed for installation and service by properly trained personnel.

Use all required personal protective equipment when working on or near a chemical metering pump.

Install the pump so that it is in compliance with all national and local plumbing and electrical codes.

Use the proper product to treat potable water systems, use only chemicals listed or approved for use.

Inspect tube frequently for leakage, deterioration, or wear. Schedule a regular pump tube maintenance change to prevent chemical damage to pump and/or spillage.

Recommended mounting is vertical with pump head pointed downward.

### **MOUNT PUMP**

Recommended mounting is vertical with pump head pointed downward.

Select a dry location (to avoid water intrusion and pump damage) above the solution tank. Best recommended location is above the solution tank in a vertical position with the pump head pointed downward.

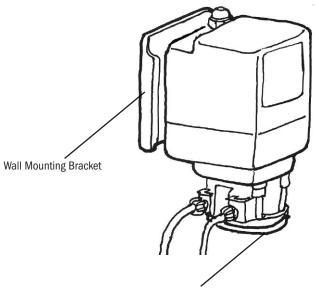
To prevent pump damage in the event of a pump tube leak, never mount the pump vertically with the pump head up.

To avoid chemical damage from fumes, DO NOT mount pump directly over an open solution tank. Keep tank covered.

Avoid flooded suction or pump mounted lower than the solution container. Draw solution from the top of the tank. Pump can run dry without damage. If pump is installed with a flooded suction, a shut-off valve or other device must be provided to stop flow to pump during service.

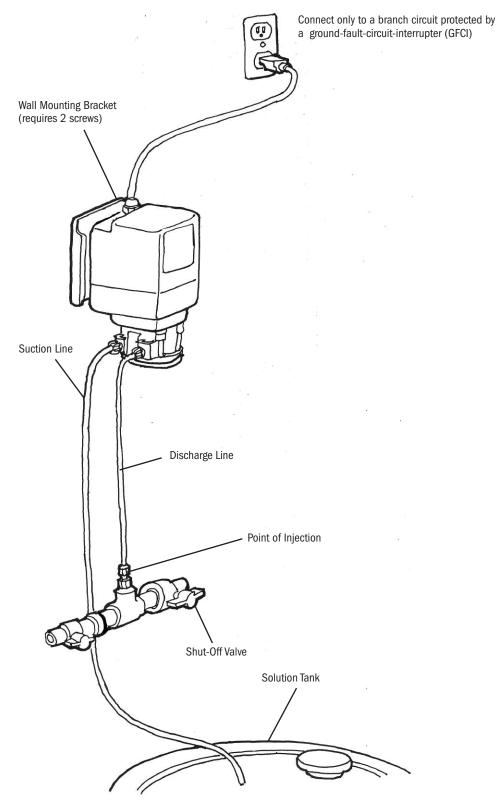
- 1. Use the mounting bracket as a template to drill pilot holes in mounting location.
- 2. Secure bracket with fasteners or wall anchors. Slide pump into bracket.
- Provide 8" clearance to allow pump removal.

I To prevent damage, verify with a volt meter that the receptacle voltage corresponds with the pump voltage.



Pump Head

### DIAGRAM



## **INSTALL SUCTION LINE TO PUMP HEAD**

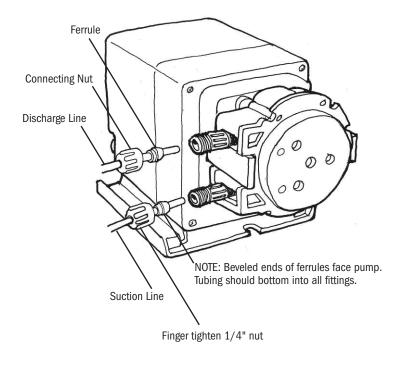
- **1.** Uncoil the suction/discharge line. Use outside of solution tank as a guide to cut proper length of suction line ensuring it will be 2-3" above the bottom of solution tank.
- Allow sufficient slack to avoid kinks and stress cracks. Always make a clean square cut to assure that the suction line is burr free. Normal maintenance requires trimming.

Suction lines that extend to the bottom of the tank can result in debris pickup leading to clogged injectors and possible tube failure.

- **2.** Make connections by sliding the line(s) through connecting nut<sup>\*</sup> and ferrule and finger tighten to the corresponding tube fittings.
- 3. Finger tighten nut to the threaded tube fitting while holding the tube fitting.

Over tightening the ferrule and nut may result in damaged fittings, crushed ferrules, and air pick up.

**DO NOT** use thread seal tape on pump tube connections or tools to tighten connections.





DO NOT use thread seal tape on pump tube threads.

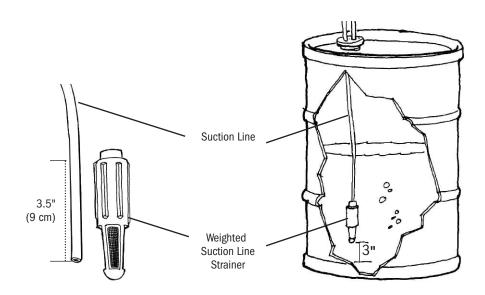
\* For 3/8" connections only. Slide line through 3/8" connecting nut and finger tighten to male end of adapter or pump tube fitting. While firmly holding the adapter or tube fitting, wrench tighten the 3/8" connecting nut one additional half turn. If leak occurs, gradually tighten the 3/8" connecting nut as required

## **INSTALL SUCTION WEIGHT TO SUCTION LINE**

- **1.** Drill a hole into the bung cap or solution tank lid. Slide the tubing through and secure the weighted strainer to the line.
- **2.** To attach the strainer, push approximately 3.5" of suction line through the cap on the strainer body. Pull tubing to make sure it is secure.
- **3.** Suspend slightly above tank bottom to reduce the chance of sediment pickup.

**DO NOT** mix chemicals in the solution container. Follow recommended mixing procedures according to the manufacturer.

**DO NOT** operate pump unless chemical is completely in solution. Turn pump off when replenishing solution.

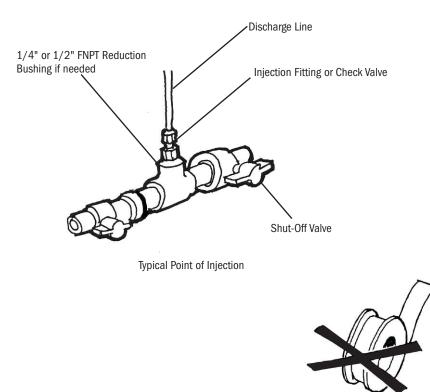


## **INSTALL DISCHARGE LINE TO PUMP HEAD AND INJECTION POINT**

- **1.** Make a secure finger tight connection on the discharge fitting of the pump head as instructed in Install Suction Line instructions.
- **DO NOT use thread seal tape on pump tube connections or tools to tighten connections.**
- 1 A WARNING HAZARDOUS PRESSURE: Shut off water or circulation system and bleed off any system pressure.

Locate a point of injection beyond all pumps and filters or as determined by the application.

- **2.** A 1/4" or 1/2" Female NPT (FNPT) connection is required for installing the injection fitting. If there is no FNPT fitting available, provide one by either tapping the pipe or installing FNPT pipe tee fitting.
- **3.** Wrap the Male NPT (MNPT) end of injection fitting with 2 or 3 turns of thread seal tape. If necessary, trim the injection fitting quill as required to inject product directly into flow of water.



DO NOT use thread seal tape on pump tube threads.

4. Hand tighten the injection fitting into the FNPT fitting.

#### Injection Fitting (S30 Models - 25 psi max.)

- **a.** Install connecting nut<sup>\*</sup> and ferrule to the pump discharge line. Insert discharge line into injection fitting until it reaches base of fitting.
- **b.** Finger tighten connecting nut<sup>\*</sup> to fitting.

#### Duckbill Check Valve or Ball Check Valve

- **a.** Prior to connection, test check valve and NPT threads for leaks by pressurizing system. If necessary, tighten an additional 1/4 turn.
- **b.** Install connecting nut<sup>\*</sup> and ferrule to the pump discharge line. Insert discharge line into check valve body until it reaches base of body.
- **c.** Finger tighten connecting nut<sup>\*</sup> to fitting.
- **5.** Depress and hold the prime button and allow pump to fully prime. The prime button will run the pump and when released the pump will return to automatic mode.
- 6. Re-pressurize system, observe chemical flow as actuated by system and check all connections for leaks.
- **7.** After suitable amount of dosing time, perform tests for desired chemical readings. If necessary, fine tune dosing levels by adjusting solution strength.

The injection point and fitting require periodic maintenance to clean any deposits or buildup. To allow quick access to the point of injection, Stenner recommends the installation of shut-off valves.

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<sup>\*</sup> For 3/8" connections only. Slide line through 3/8" connecting nut and finger tighten to male end of adapter or pump tube fitting . While firmly holding the adapter or tube fitting, wrench tighten the 3/8" connecting nut one additional half turn. If leak occurs, gradually tighten the 3/8" connecting nut as required

# **TROUBLESHOOTING - MOTOR**

### **A WARNING** HAZARDOUS VOLTAGE: DISCONNECT power cord before removing motor cover for service. Electrical service should be performed by trained personnel only.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Display is blank or not readable	No power cord connection point	Check voltage of receptacle/controller output voltage
	Failed power supply	Return to factory for evaluation
	Pump requires re-initialization	Cycle power to the pump
	Display is too dim	Increase display brightness in the CONFIGURATION menu
No response to input signal	Pump is in alarm or STANDBY condition	Clear and correct any alarm or indicated conditions (leak detect, standby, etc.)
	Pump is not in the correct mode	Ensure that pump has been programmed for the correct input signal and that the operating display shows the desired mode of operation
	No signal or improper signal level input to the pump	If in signal mode, confirm signal level input to the pump by looking for the icon on the screen
	Input signal is not wired correctly	Confirm that the input signal is connected to the correct wires
Output is erratic	Signal is fluctuating rapidly	Check stability of signal being input to the pump
	Noise on the signal wire	If shielded wire is connected to the pump input signal cable, ensure it is propperly grounded at the signal source
Output is higher or lower than expected	Signal is fluctuating rapidly	Check programming, ensure the values entered are correct
	Pump calibration data is incorrect	Check that the value entered for CALIBRATION in the CONFIGURATION menu is correct
	Input signal level is higher or lower than anticipated	Check input signal level to the pump
Pump cycles ON/OFF	Failed fan	Return to factory for evaluation
	Pump is too hot	Check that maximum ambient temperature is less than 104°F; Shade pump if exposed to direct sunlight
	Red (+12VDC) wire on the signal cable is not capped and insulated (if not terminated)	Cap and insulate the Red wire to prevent it from shorting
	Load too high or shortened on 4-20mA output	Maximum loop impedance is 300mA; Ensure output is not shortened

# TROUBLESHOOTING - MOTOR continued

PROBLEM	POSSIBLE CAUSE	SOLUTION
Display is working, pump is not	Pump requires re-initialization	Cycle power to the pump
	Failed motor	Return to factory for evaluation
	Pump is in alarm or STANDBY	Clear and correct any alarm or indicated conditions (leak detect, standby, etc.)
	Pump is not in the correct mode	Ensure that pump has been programmed for the correct input signal and that the operating display shows the desired mode of operation
	No signal or improper signal level input to the pump	If in signal mode, confirm signal level being input to the pump is correct
	Input signal is not wired correctly	Confirm that the input signal is connected to the correct wires
Pump does not alarm for given condition	Incorrect programming or alarm condition not set up	Ensure that alarm is enabled for the programmed mode
	Relay is incorrectly configured	Ensure relay is properly configured for NO or NC in the program
	Relay output wired incorrectly	Output relays are dry contact and do not provide any voltage; Confirm that wiring is correct
Operating display shows incorrect units	Incorrect programming	Check that the value entered for UNITS in the CONFIGURATION menu is correct
	Display unit has been cycled	Press the BACK button to cycle through available display options
Can't enter Main Menu	Forgot password	Contact the factory for password reset
Leak detect not working	Incorrect programming	Ensure that alarm is enabled for the programmed mode
	Check that leak detect bracket is installed, clips are in place, and leak pins are making contact with pins on case	Install leak detect option; check to ensure that pins are clean and making good contact
	Leak detect sensitivity was improperly adjusted or does not match application	Adjust the leak detect sensitivity so that the unit detects the chemical; Ensure that the setting is such that the unit does not activate with water if not located in a dry location

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# **TROUBLESHOOTING – PUMP HEAD**

PROBLEM	POSSIBLE CAUSE	SOLUTION
Components cracking	Chemical attack	Check chemical compatibility
Pump head leaking	Pump tube rupture	Replace pump tube and connections
No pump output,	Depleted solution tank	Replenish solution
pump head rotates	Pump suction line weight is above solution	Maintain suction line 2-3" above bottom of tank
	Leak in the suction line	Inspect or replace suction line
	Ferrules installed incorrectly, missing or damaged	Replace ferrules
	Injection point is clogged	Inspect and clean injection point
	Clogged suction and/or discharge line and/or check valve	Clean and/or replace as needed
	Life of roller assembly exhausted	Replace roller assembly
	Life of pump tube exhausted, S30 Models only	Replace pump tube, ferrules; center tube
	Life of pump tube exhausted, S40 Models only	Replace pump tube, refer graphic below
	Suction line is flush with the nose of the weighted strainer	Pull suction line approximately 1" from bottom of strainer, cut bottom of suction line at an angle
Low pump output,	Life of roller assembly exhausted	Replace roller assembly
pump head rotates	Life of pump tube exhausted, S30 Models only	Replace pump tube, ferrules; center tube
	Life of pump tube exhausted, S40 Models only	Replace pump tube, refer graphic below.
	Rollers worn or broken	Replace roller assembly
	Injection point is restricted	Inspect and clean injection point
	Incorrect tube size	Replace tube with correct size
	High system back pressure	Verify system pressure against tube psi, replace tube if needed
No pump output,	Stripped roller assembly	Replace roller assembly
pump head doesn't rotate	Motor problem	Refer to motor section
Pump output high	Incorrect tube size or setting	Replace tube with correct size or adjust settings
	Roller assembly broken	Replace roller assembly



#### S40 MODELS ONLY

**IMPORTANT: DO NOT TWIST THE TUBE** during installation. To ensure it doesn't twist, keep the tube positioned so the <u>printed</u> <u>description</u> stays aligned along the length of the tube.

# **TROUBLESHOOTING – PUMP TUBE**

**Notice:** A leaking pump tube damages the metering pump. Inspect pump frequently for leakage and wear. Refer to Tube Replacement section for additional safety precautions and instructions.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Tube leaking	Pump tube ruptured	Replace pump tube, ferrules; center tube
	Calcium or mineral deposits	Clean injection fitting, replace pump tube, ferrules; center tube
	Excessive back pressure	Verify system pressure against tube psi, replace tube if needed
	Tube is twisted, S30 Models only	Replace pump tube, ferrules; center tube
	Tube not centered, S30 Models only	Replace pump tube, ferrules; center tube
	Tube is twisted, S40 Models only	Replace the tube.
		<b>IMPORTANT: DO NOT TWIST THE TUBE</b> during installation. To ensure it doesn't twist, keep the tube positioned so the printed description stays aligned along the length of the tube. Use your fingers to center the tube on the rollers.
Tube life is shortened	Chemical attack	Check chemical compatibility
	Mineral deposits at injection point	Remove deposits, replace pump tube, ferrules; center tube
	Sediment blockage at check valve	Clean injection fitting, ensure suction line is 2-3" above bottom of tank
	Degraded check valve duckbill	Replace duckbill at every tube change
	Duckbill in wrong orientation	Reverse duckbill orientation
	Tube manually stretched or pinched during replacement	Follow tube replacement instructions and allow roller assembly to stretch tube into place
	Seized rollers caused abrasion on tube	Clean roller assembly or replace
	Exposure to heat or sun	Do not store tubes in high temperatures or in direct sunlight
Tube connection is leaking	Missing ferrule on 1/4" line	Replace ferrule
	Crushed 1/4" ferrule	Replace ferrule
	1/4" ferrule in wrong orientation	Beveled ends of ferrules face pump. Tubing should bottom into all fittings
	Missing 3/8" nut sleeve or gripper	Replace nut

## **TUBE REPLACEMENT – SAFETY INFORMATION**

#### A WARNING RISK OF CHEMICAL EXPOSURE

- To reduce risk of exposure, check the pump tube regularly for leakage. At the first sign of leakage, replace the pump tube.
- To reduce risk of exposure, the use of proper personal protective equipment is mandatory when working on or near chemical metering pumps.
- To reduce risk of exposure, and also prior to service, shipping, or storage, pump generous amounts of water or a compatible buffer solution to remove chemical from pump.
- A Consult chemical manufacturer and SDS sheet for additional information and precautions for the chemical in use.
- A Personnel should be skilled and trained in the proper safety and handling of the chemicals in use.
- ▲ Inspect tube frequently for leakage, deterioration, or wear. Schedule a regular pump tube maintenance change to prevent chemical damage to pump and/or spillage.

#### A CAUTION PINCH POINT HAZARD

A Use extreme caution when replacing pump tube. Be careful of your fingers and do not place fingers near rollers.

#### **A WARNING** HAZARDOUS PRESSURE/CHEMICAL EXPOSURE

- ⚠️ Use caution and bleed off all resident system pressure prior to attempting service or installation.
- Let use caution when disconnecting discharge line from pump. Discharge may be under pressure. Discharge line may contain chemical.

#### NOTICE: Indicates special instructions or general mandatory action.

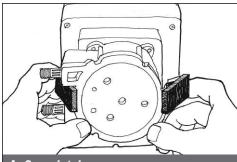
**DO NOT** apply grease, oil, or lubricants to the pump tube or housing.

Prior to pump tube replacement, inspect the entire pump head for cracks or damaged components. Ensure rollers turn freely.

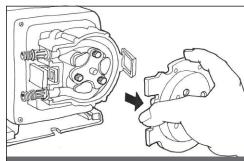
Rinse off chemical residual and clean all chemical and debris from pump head components prior to tube replacement. Apply AquaShield<sup>™</sup> to main shaft and tube housing cover bushing during tube replacement.

**DO NOT** pull excessively on pump tube. Avoid kinks or damage during tube installation.

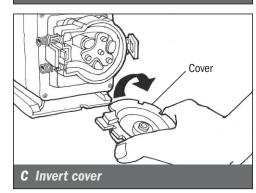
Inspect the suction and discharge lines, injection point (into pipe), and injection check valve duckbill for blockages after any tube rupture. Clear or replace as required.

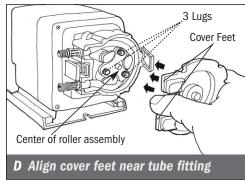






#### **B** Remove cover





### PREPARATION

- 1. Follow all safety precautions prior to tube replacement.
- **2.** Prior to service, pump water or a compatible buffer solution through the pump and suction and discharge lines to remove chemical and avoid contact.

## **REMOVE THE PUMP TUBE**

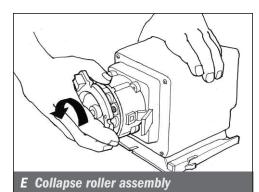
- **1.** Unplug the power cord to ensure the power to the pump is off. Disconnect the input signal.
- 2. Depressurize and disconnect the suction and discharge lines.
- **3.** Open the back and front of the latches on both sides of the head. *Illustration A*

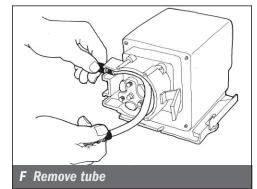
For CE pump only: Remove the safety screw on cover.

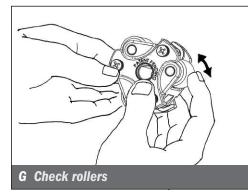
- **4.** Remove the tube housing cover and flip to use as a tool in the next step. *Illustration B & C*
- **5.** Align the center of the inverted cover with the center of the roller assembly so that the three holes on the face of the cover align with the three knurled lugs on the roller assembly. Position the cover feet near the tube fittings. *Illustration D*

NOTE: The roller assembly needs to be collapsed to remove the tube.

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### **REMOVE THE PUMP TUBE** continued

6. Collapse the roller assembly.

#### S30 Models

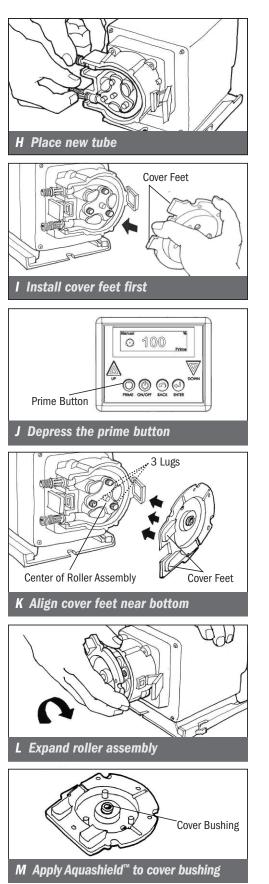
Hold the pump securely, use the tube housing cover as a wrench and quickly (snap) rotate the cover counterclockwise to collapse the roller assembly. The tube will no longer be pressed against the tube housing wall. *Illustration* E

#### S40 Models



Hold the motor securely with one hand. With the other hand, hold the tube housing cover with your forefingers inside the top lip of the cover. Use the cover as a wrench and with your palm quickly (snap) rotate the cover counterclockwise to collapse the roller assembly. The tube will no longer be pressed against the tube housing wall.

- 7. Remove and discard the pump tube. Illustration F
- **8.** Remove the roller assembly and housing. Set them aside to re-install later.
- **9.** Use a non-citrus all-purpose cleaner to clean chemical residue from the tube housing, roller assembly and cover.
- **10.** Check the housing for cracks. Replace if cracked.
- **11.** Ensure the rollers turn freely. Replace the roller assembly if the rollers are seized or worn or if there is a reduction or lack of output from the pump. *Illustration G*
- 12. Reinstall clean tube housing.
- **13.** Apply AquaShield<sup>™</sup> to the shaft tip.
- 14. Install the roller assembly.



### INSTALL THE TUBE/ EXPAND THE ROLLER ASSEMBLY

- **1.** Ensure the power to the pump is off and the input signal is disconnected.
- 2. Install the tube.

#### S30 Models

- Place the new tube in the pump head and use your fingers to center it on the rollers. *Illustration H* 

#### S40 Models



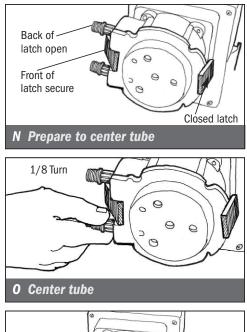
 Place the new tube in the pump head.
 IMPORTANT: DO NOT TWIST THE TUBE during installation. To ensure it doesn't twist, keep the tube positioned so the printed description stays aligned along the length of the tube.
 Use your fingers to center the tube on the rollers.

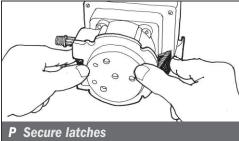
- **3.** Place the tube housing cover (feet first) on the tube housing, affix the front of the latches to the cover lip and then press the latches back to secure. Be sure the cover is seated with the sleeve bearing on the shaft and is flush with the housing before latching. *Illustration I*
- **4.** With the cover latched, plug the pump in. Depress the prime button to allow the pump to run the roller assembly in its collapsed position for four minutes. *Illustration J*
- 5. Unplug the power cord to ensure the power to the pump is off.
- **6.** Remove the tube housing cover and flip to use as a tool in the next step.
- **7.** Align the center of the inverted cover with the center of the roller assembly so that the three holes on the face of the cover align with the three knurled lugs on the roller assembly. Position the cover feet near the bottom. *Illustration K*

NOTE: The roller assembly needs to be expanded so the tube is pressed against the tube housing wall.

- **8.** Hold the pump securely. Use the cover as a wrench and quickly (snap) rotate the roller assembly clockwise to expand the roller assembly. The tube will be pressed against the tube housing wall. *Illustration L*
- Apply a small amount of AquaShield<sup>™</sup> to the cover bushing ONLY. DO NOT lubricate the pump tube. *Illustration M*
- **10.** Place the tube housing cover (feet first) on the tube housing, affix the front of the latches to the cover lip and then press the latches back to secure. Be sure the cover is seated with the sleeve bearing on the shaft and is flush with the housing before latching. *Illustration I*

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## **S30 MODELS – CENTER THE TUBE**

- **1.** Lift the latch located between the tube fittings, leaving the end of the latch engaged with the lip on the tube housing cover. Leave the latch on the opposite side engaged. *Illustration N*
- **2.** Plug the pump in. Depress the prime button and turn the tube fitting on the suction side not more than 1/8 of a turn in the direction the tube must move *Illustration O*
- **3.** Do not let go of the fitting until the tube rides approximately in the center of the rollers.
- **4.** Release the prime button, let go of the fitting, and secure the latch between the fittings. *Illustration P*
- **5.** Inspect the suction and discharge lines, point of injection, and check valve for blockages. Clean and/or replace as required.
- 6. Reconnect the suction and discharge lines.
- 7. Prime pump and verify operation.
- **8.** Place pump in desired operating mode.

## **CLEANING THE POINT OF INJECTION – SAFETY INFORMATION**

**NOTICE:** Indicates special instructions or general mandatory action.

**NOTICE:** Pumps are supplied with an injection fitting or check valve. All allow the extension tip to be installed in the center of the pipe directly in the flow of water to help reduce deposit accumulation.

Marns about hazards that CAN cause death, serious personal injury, or property damage if ignored.

This is the safety alert symbol. When displayed in this manual or on the equipment, look for one of the following signal words alerting you to the potential for personal injury or property damage.

#### **MARNING** HAZARDOUS PRESSURE/CHEMICAL EXPOSURE:

Use caution and bleed off all resident system pressure prior to attempting service or installation.

Luse caution when disconnecting discharge line from pump. Discharge line may be under pressure. Discharge line may contain chemical.

To reduce risk of exposure, the use of proper personal protective equipment is mandatory when working on or near chemical metering pumps.

# CLEANING THE POINT OF INJECTION continued

- 1. Turn metering pump off and unplug cord. Disable any water pump or auxiliary equipment's electrical supply.
- **2.** Depressurize system and bleed pressure from pump discharge line.
- **3.** Loosen and remove the 3/8" or 1/4" nut & ferrule from the check valve or injection fitting to disconnect discharge line.

#### Duckbill Check Valve or Ball Check Valve

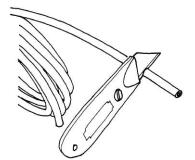
- Unscrew the top fitting (check valve body) to disassemble. The bottom fitting (injection fitting with arrow) should remain attached to the pipe.
- Remove duckbill or remove ball check components from check valve body. Inspect and replace parts as needed. If using a ball check valve be careful not to stretch or damage the spring.
- **4.** Insert a #2 Phillips head screwdriver through injection fitting into the pipe to locate or break up accumulated deposits. If screwdriver cannot be inserted, drill the deposit out of the injection fitting. DO NOT drill through the opposite pipe wall.
- 5. Replace discharge line if cracked or deteriorated. If the end is clogged, cut off the calcified or blocked section of discharge line.

#### Injection Fitting (S30 Models - 25 psi max.)

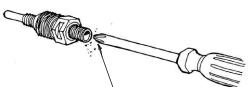
Replace ferrule and reinstall the discharge line to the injection fitting approximately 3/4"-1" until it stops.

#### Duckbill Check Valve or Ball Check Valve

- Reassemble the check valve.
- Replace ferrule and reinstall the discharge line to the injection check valve approximately 3/4" until it stops.
- **6.** Tighten the connecting nut finger tight while firmly holding the tube fitting. The 3/8" nut may be wrench tightened one additional half turn. If leak occurs, gradually tighten the 3/8" nut as required.
- **7.** Enable the water pump electrical supply and pressurize the water system. NOTE: The roller assembly must be expanded so the tube is pressed against the tube housing wall.
- 8. Put the metering pump back in service and inspect all connections for leaks.



Cut off the calcified or blocked section.



Clean out accumulated deposits with a #2 Phillips head screwdriver.

Periodic inspection and cleaning of the point of injection will maintain proper pump operation and provide maximum tube life.

## **PUMP HEAD PARTS**

### **S30 MODELS**

PART NUMBER	UM	DESCRIPTION
\$3400-1	EA	S3QP Tube Housing with Latches
S3400-2	2-PK	
\$3500-1	EA	S3QP Roller Assembly
S3500-4	4-PK	
S3600-1	EA	S3QP Tube Housing Cover
S3600-4	4-PK	
QP401-2	2-PK	S3QP Latches

## **S40 MODELS**

PART NUMBER	UM	DESCRIPTION
S4400-1	EA	S4QP Tube Housing with Latches
S4400-2	2-PK	
S4500-1	EA	S4QP Roller Assembly
S4500-4	4-PK	
S4600-1	EA	S4QP Tube Housing Cover
S4600-4	4-PK	

## **PUMP HEADS**

### **S30 MODELS**

25 psi (1.7 bar) max. Includes S3QP pump head, tube, ferrules 1/4" (EUROPE 6 mm)

UM	DESCRIPTION			
EA	S3QP Pump Head; Santoprene® tube select # 3, 4, 5 for			
2-PK				
EA	S3QP Pump Head: Versilon <sup>®</sup> tube select # 3, 4 or 5 for			
EUROPE				
EA	S3QP Pump Head; Santoprene® tube select # 3, 4 or 5 for			
2-PK				
EA	S3QP Pump Head; Versilon <sup>®</sup> tube select # 3, 4 or 5 for			
	EA 2-PK EA EA 2-PK			

100 psi (6.9 bar) max. Includes S3QP pump head, tube, duckbill, ferrules 1/4" (EUROPE 6 mm)

PART NUMBER	UM	DESCRIPTION		
S310 -1	EA	S3QP Pump Head; Santoprene® tube select # 1, 2 or 7 for ■		
S310 -2	2-PK			
\$320 -1	EA	S3QP Pump Head; Versilon <sup>®</sup> tube select # 1 or 2 for		
EUROPE	EUROPE			
S315 -1	EA	S3QP Pump Head; Santoprene® tube select # 1, 2 or 7 for		
S315 -2	2-PK			
S325 -1	EA	S3QP Pump Head; Versilon <sup>®</sup> tube select # 1 or 2 for		

## **S40 MODELS**

25 psi (1.7 bar) m	nax. Includes S4	4QP pump head and tube
PART NUMBER	UM	DESCRIPTION
S4105X-1	EA	S4QP Pump Head: #5X Santoprene® tube
S4105X-2	2-PK	

100 psi (6.9 bar) max. Includes S4QP pump head and tube

PART NUMBER	UM	DESCRIPTION
S4107X-1	EA	S4QP Pump Head; #7X Santoprene® tube
S4107X-2	2-PK	

NOTE: Confirm material compatibility with the chemical resistance guide in the catalog.

Refer to the Flow Rate Outputs chart to match the pump with the correct tube.

# **PUMP HEAD SERVICE KITS**

### **S30 MODELS**

25 psi (1.7 bar) max. Kit includes S3QP roller assembly, pump tube, 1/4" ferrules & connecting nuts, latches

PART NUMBER	UM	DESCRIPTION		
S310 K	KIT	S3QP Pump Head Service Kit; Santoprene® tube select # 3, 4 or 5 for		
\$320 K	KIT	S3QP Pump Head Service Kit; Versilon <sup>®</sup> tube select # 3, 4 or 5 for		
EUROPE	EUROPE			
\$311 K	KIT	S3QP Pump Head Service Kit; Santoprene® tube select # 3, 4 or 5 for		
S321 K	KIT	S3QP Pump Head Service Kit; Versilon® tube # 3, 4 or 5 for		

100 psi (6.9 bar) max. Kit includes S3QP roller assembly, pump tube, 1/4" ferrules & connecting nuts, latches, duckbill

PART NUMBER	UM	DESCRIPTION
S310 K	KIT	S3QP Pump Head Service Kit; Santoprene® tube select # 1, 2 or 7 for
\$320 K	KIT	S3QP Pump Head Service Kit; Versilon® tube select tube # 1 or 2 for
EUROPE		
S311 K	KIT	S3QP Pump Head Service Kit; Santoprene® tube select # 1, 2 or 7 for
S321 K	KIT	S3QP Pump Head Service Kit; Versilon® tube select # 1 or 2 for

### **S40 MODELS**

25 psi (1.7 bar) max. Kit includes S4QP roller assembly, tube, 3/8" nuts

PART NUMBER	UM	DESCRIPTION
S4105XK	KIT	S4QP Pump Head Service Kit; #5X Santoprene® tube

**100 psi (6.9 bar) max.** Kit includes S4QP roller assembly, tube, 3/8" nuts

PART NUMBER	UM	DESCRIPTION
S4107XK	KIT	S4QP Pump Head Service Kit; #7X Santoprene® tube

NOTE: Confirm material compatibility with the chemical resistance guide in the catalog.

Refer to the Flow Rate Outputs chart to match the pump with the correct tube.

## **PUMP TUBES**

### **S30 MODELS**

Includes ferrules 1/4"

PART NUMBER	UM	DESCRIPTION	
UCCP20	2-PK	Santoprene® tube select # 1, 2, 3, 4 or 5 for	
MCCP20	5-PK		
UCCP207	2-PK	Santoprene <sup>®</sup> #7 tube	
MCCP207	5-PK		
UCTYG0	2-PK	Versilon <sup>®</sup> tube select # 1, 2, 3, 4 or 5 for	
MCTYG0	5-PK		
EUROPE Includes	ferrules 6 mm		
UCCP2 CE	2-PK	Santoprene® tube select # 1, 2, 3, 4 or 5 for	
MCCP2 CE	5-PK		
UCCP27CE	2-PK	Santoprene <sup>®</sup> #7 tube	
MCCP27CE	5-PK		
UCTY CE	2-PK	Versilon <sup>®</sup> tube select # 1, 2, 3, 4 or 5 for	
MCTY CE	5-PK		

Includes duckbills,	ferrules 1/4"	
PART NUMBER	UM	DESCRIPTION
UCCP	2-PK	Santoprene® tube # 1 or 2 for
UCCP7FD	2-PK	Santoprene® #7 tube
UCTY FD	2-PK	Versilon <sup>®</sup> tube select # 1or 2 for
EUROPE Includes	s ferrules 6 mm	
UC FDCE	2-PK	Santoprene® tube select # 1 or 2 for
UC7FDCE	2-PK	Santoprene® #7 tube
UCTY DCE	2-PK	Versilon <sup>®</sup> tube select # 1 or 2 for

## **S40 MODELS**

PART NUMBER	UM	DESCRIPTION
S4005X-2	2-PK	Santoprene <sup>®</sup> #5X tube
S4005X-5	5-PK	
S4007X-2	2-PK	Santoprene <sup>®</sup> #7X tube
S4007X-5	5-PK	

NOTE: Confirm material compatibility with the chemical resistance guide in the catalog.

Refer to the Flow Rate Outputs chart to match the pump with the correct tube.

# **CHECK VALVES**

### **S30 MODELS**

Duckbill Check Valves 100 psi (6.9 bar) max. Includes duckbills, ferrules 1/4" (EUROPE 6 mm)

	and the second sec		
PART NUMBER	UM	DESCRIPTION	
UCDBINJ	EA	1/4" Duckbill Check Valve includes Santoprene® duckbill, nut, ferrule	
MCDBINJ	5-PK		
UCTYINJ	EA	1/4" Duckbill Check Valve includes Pellethane® duckbill, nut, ferrule	
MCTYINJ	5-PK		
UCINJ38	EA	3/8" Duckbill Check Valve includes Santoprene® duckbill, nut	
MCINJ38	5-PK		
UCTYIJ38	EA	3/8" Duckbill Check Valve includes Pellethane® duckbill, nut	
MCTYIJ38	5-PK		
EUROPE			
UCINJCE	EA	6 mm Duckbill Check Valve includes Santoprene® duckbill, nut, ferrule	
MCINJCE	5-PK		
UCTINJCE	EA	6 mm Duckbill Check Valvez includes Pellethane® duckbill, nut, ferrule	
MCTINJCE	5-PK		

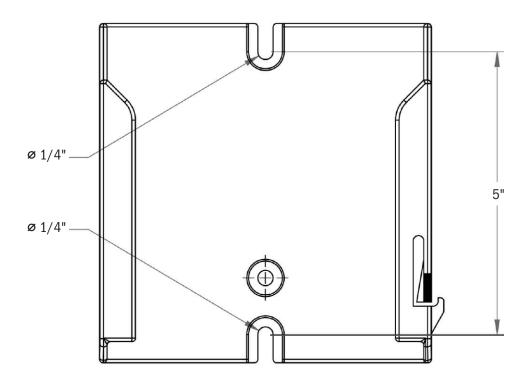
### **S40 MODELS**

**Ball Check Valve** 

PART NUMBER	UM	DESCRIPTION
BC038-1	EA	3/8" Ball Check Valve includes FKM seat & O-Ring, tantalum spring, nut

NOTE: Confirm material compatibility with the chemical resistance guide in the catalog.

## WALL MOUNTING BRACKET DIMENSIONS



**NOTICE:** Leave 8" of clearance above pump to allow for removal from mounting bracket.

### STENNER PUMPS

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Assembled in the USA

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