

S128 MEDICATOR

PERISTALTIC METERING PUMP

INSTALLATION AND MAINTENANCE MANUAL

 **WARNING**

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

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WARRANTY AND CUSTOMER SERVICE

LIMITED WARRANTY

Stenner Pump Company will for a period of two (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® is a registered trademark of the Stenner Pump Company.
Santoprene® is a registered trademark of Exxon Mobil Corporation.
Hastelloy® is a registered trademark of Haynes International, Inc.
AquaShield™ is a trademark of Houghton International.

SAFETY INFORMATION

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

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

 **WARNING** ELECTRIC SHOCK HAZARD

 **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.

 **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.

 **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).

 **WARNING** To reduce the risk of electric shock, replace damaged cord immediately. Contact the factory or an authorized service facility for repair.


 **WARNING** **DO NOT** alter the power cord or plug end. **DO NOT** use receptacle adapters.

 **WARNING** **DO NOT** use pump with a damaged or altered power cord or plug. Contact the factory or authorized service facility for repair.

 **WARNING** After installation, the power supply plug must be accessible during use.

 **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.

 **WARNING** This pump has not been investigated for use in marine areas.

 **AVERTISSEMENT** La pompe n'a pas été vérifiée et approuvée pour utilisation sur des applications de installation marine.

 **PELIGRO** Este dosificador no ha sido investigado para uso en áreas marinas.

 **WARNING** EXPLOSION HAZARD


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

 **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.

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


SAFETY INSTRUCTIONS

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

 **CAUTION** To reduce risk of electric shock, pull plug before servicing this pump.

 **CAUTION** This pump has been evaluated for use with water only.


 **CAUTION** 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.

 **CUIDADO** Dosificador no sumergible. Adecuado para el uso interior y exterior.

 **CAUTION PLUMBING**








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.

 **CAUTION** Electrical installation should adhere to all national and local codes. Consult licensed professional for assistance with proper electrical installation.

 **CAUTION** Pump uses a class 2 switching power supply.

SAVE THESE INSTRUCTIONS

 **CAUTION 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.
-  The ambient temperature rating is 104°F (40°C).

FLOW RATE OUTPUTS

60 psi (4.1 bar) max.

| Item No. Prefix | Pump Tube | Ounces per Minute | Milliliters per Minute |
|-------------------------------|-----------|-------------------|------------------------|
| S4M8X | 8X | 10.0 | 295.7 |
| Approximate Outputs @ 50/60Hz | | | |

NOTE: For 1:128 dosing, the maximum system water flow is 10 gallons/minute or 37.9 liters/minute.



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® (FDA approved)

Ball Check Valve Components

- 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

Polyethylene (FDA approved)

Tube Fittings & Injection Fittings

PVC or Polypropylene (both NSF listed)

Connecting Nuts

Polypropylene (NSF listed)

Suction Line Strainer and Cap

PVC or Polypropylene (both NSF listed); ceramic weight

All Fasteners

Stainless steel

Pump Head Latches

Stainless steel

Leak Detect Components

Hastelloy®

ACCESSORIES


- 3 Connecting Nuts 3/8"
- 1 Ball Check Valve
- 1 Weighted Suction Line Strainer 3/8"
- 1 20' Roll of Suction/Discharge Tubing 3/8", white or UV black
- 1 Additional Pump Tube
- 1 Mounting Bracket
- 1 Manual
- 1 Quick Reference Guide Poster

GENERAL INFORMATION

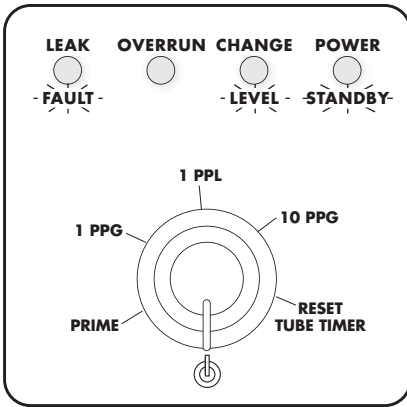
The S128 Medicator injection pump offers practical and flexible functions for animal health applications. The pump is designed to automatically inject solution proportional to flow at the rate of 1 ounce of solution to 128 ounces of water. It is activated by a dry contacting water meter with pulse rates of 1 or 10 PPG or 1 PPL.

The pump has three speeds to automatically adjust the injection rate when the system flow rate increases or decreases. This flow response design allows the pump to evenly distribute and proportionally inject product into the water line especially at low flow rates.

PUMP FEATURES

- 1:128 dosing for process flows up to 10 gpm
- Heavy duty brushless DC motor with ball bearing support
- Adjustable Potentiometer: Prime, 1 PPG, 1 PPL, 10 PPG, Reset Tube Timer,  Standby
- DIP Switch Settings: Leak Detect, Tube Change Timer
- Inputs: Standby, Pulse, Level (when used with fluid level device)
- Output Relays: Signal Repeater, Leak Detect, Drive Fault, Low Level
- LED Indicators: Leak/Fault, Overrun, Change/Level, Power/Standby
- Clear cover on control panel for moisture protection
- cULus indoor/outdoor

OPERATION




LED Indicators and Controls

CONTROLS

PULSE RATE

To set the pump with the water meter pulse rate, turn the potentiometer to 1 PPG, 1 PPL or 10 PPG.



STANDBY

To place the pump in STANDBY, turn the potentiometer fully counterclockwise to the  setting. In standby, the pump does not run, but the incoming water meter pulses are still repeated by the signal repeater relay.

RESET TUBE TIMER

To reset the tube change timer and turn off the CHANGE indicator light, turn the potentiometer to RESET TUBE TIMER for 5 seconds then turn it to the pulse setting. The pump does not run when on the RESET TUBE TIMER setting.

PRIME



To prime the pump, turn the potentiometer to PRIME. After 5 seconds, pump runs for 60 seconds and stops. To initiate another prime cycle, turn the potentiometer to  for 5 seconds and then turn it back to the PRIME setting. When sufficiently primed, turn the potentiometer to , then to the desired pulse setting.

OPERATION continued

LED INDICATORS

POWER/STANDBY



POWER **Solid green** Mains power is connected.

STANDBY **Blinking green** Pump received a contact closure on the standby inputs OR Pump is set on .
To Clear: Automatically clears when pump no longer receives a contact closure on the standby inputs and the potentiometer is not set to .

CHANGE/LEVEL

CHANGE **Solid red** Tube Change Timer reached the set pump tube run time.
To Clear: Set the potentiometer to RESET TUBE TIMER for 5 seconds, then return to a pulse setting.

LEVEL **Blinking red** Pump received a contact closure on the level inputs (must be used with a fluid level device).
To Clear: Automatically clears when the pump no longer receives a contact closure on the level inputs.

OVERRUN **Blinking red** Pump's flow rate output cannot keep up with the system water flow rate.
To Clear: Automatically clears when the system water flow rate is below the pump's maximum flow rate output capacity.
  **CAUTION** OVERRUN indicates the system water flow has exceeded the pump's maximum flow rate output capacity and will cause incorrect dosing. Check the pump setting, water meter pulse rate and the water system flow rate. When using the S128 Medicator, the maximum system water flow is 10 gallons/minute or 37.9 liters/minute.

LEAK/FAULT

LEAK **Solid red** When a leak is detected.
To Clear: Clears when the leak detect components are free of chemical or residue and power to the pump is disconnected, then reconnected.

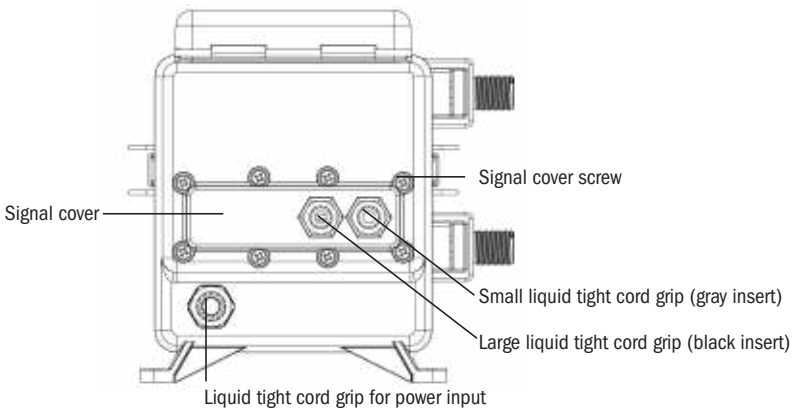
FAULT **Blinking red** If pump has a drive fault error.
To Clear: Disconnect then reconnect power, if FAULT is still present contact factory for evaluation.

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 0.25" 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.

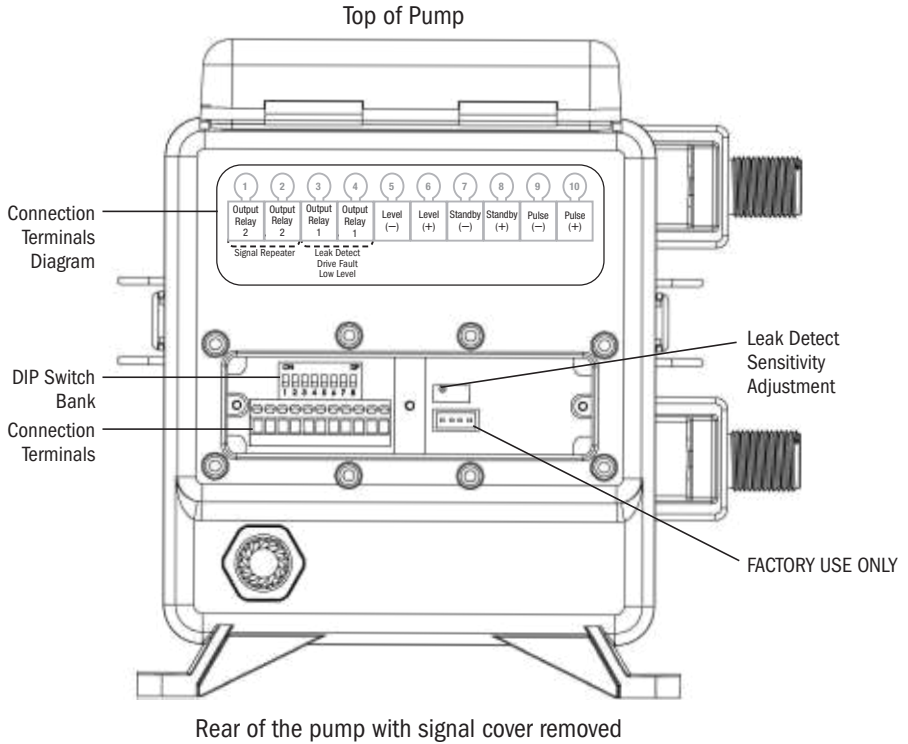
⚠ WARNING Failure to properly tighten or secure the cord grip or signal cover may allow water to enter the pump enclosure, which can cause pump failure, property damage, or personal injury.



⚠ 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".

CONNECTIONS continued

DIAGRAM




CAUTION If connecting a shielded signal cable to the pump, ensure that the shield wire is properly grounded on the controller (non-pump) side.

CAUTION DO NOT run signal wires in proximity to high voltage wires.

CONNECTIONS continued

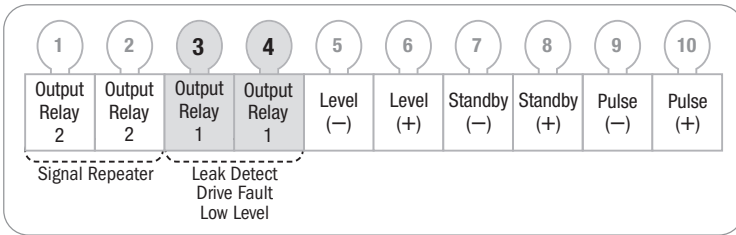
OUTPUT RELAYS

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

 **WARNING** The output relays are for signal level only. Maximum rating is for 24VDC at 50mA.

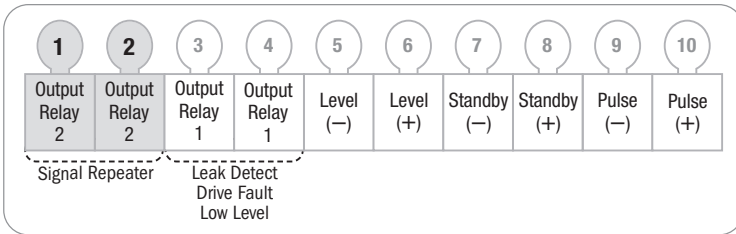
Relay 1: Leak Detect, Drive Fault, or Low Level

- Relay 1 is Normally Open.
- The relay will close if a leak is detected, a drive fault occurs, or a low level is indicated on input positions 5 & 6.
- Connect to Relay 1 in positions 3 and 4.



Relay 2: Signal Repeater

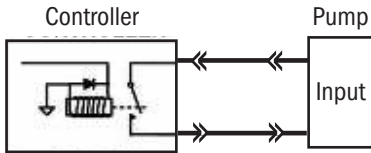
- Relay 2 is Normally Open.
- The Signal Repeater repeats the incoming pulse.
- The Signal Repeater works at all pulse rates. The pump must have power applied.
- Connect to Relay 2 in positions 1 and 2.



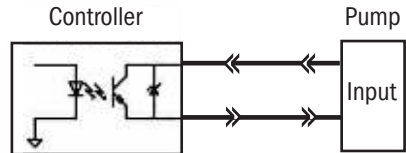
CONNECTIONS continued

PULSE INPUT

When the pump receives a pulse signal from a water meter, the pump injects the solution.



Dry Contact Relay Output



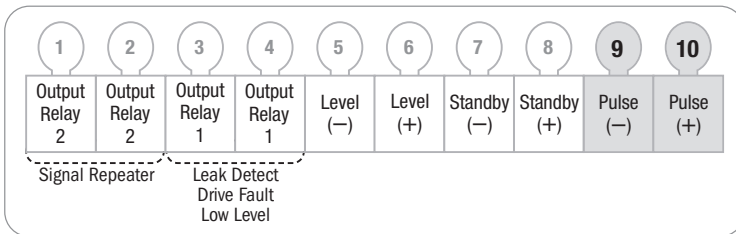
Open Collector Output

For connection to a Dry Contact

- There is no polarity to observe.
- Connect relay to Pulse (-), position 9 and Pulse (+), position 10.

For connection to an Open Collector

- Polarity must be observed.
- Connect OC positive to Pulse (+), position 10.
- Connect OC common to Pulse (-), position 9.

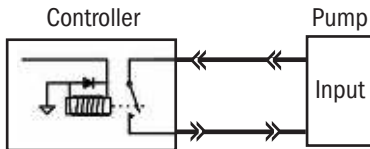


CONNECTIONS continued

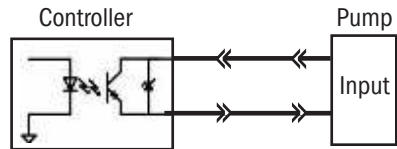
LEVEL INPUT

When using a fluid level device, the Level input can indicate a low level in the solution tank.

When a dry contact or open collector signal is received on the Level inputs, Relay 1 will close and remain closed as long as the signal is present. The red CHANGE/LEVEL LED blinks as long as the signal is present. The pump will continue to operate.



Dry Contact Relay Output



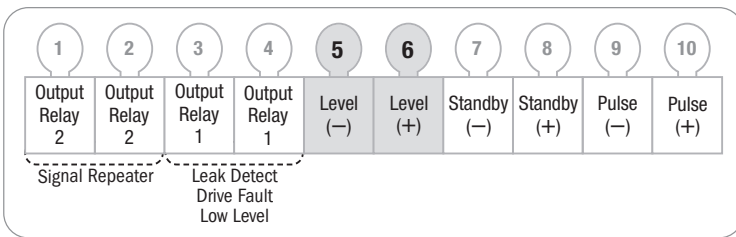
Open Collector Output

For connection to a Dry Contact

- There is no polarity to observe.
- Connect relay to Level (-), position 5 and Level (+), position 6.

For connection to an Open Collector

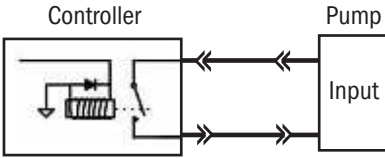
- Polarity must be observed.
- Connect OC positive to Level (+), position 6.
- Connect OC common to Level (-), position 5.



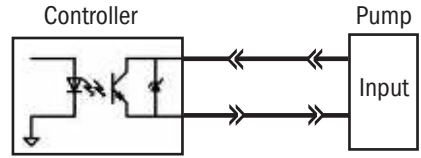
CONNECTIONS continued

STANDBY INPUT

The Standby input can stop the pump remotely. When a dry contact or open collector signal is received to the Standby inputs, the pump ceases operation as long as the signal is present. In standby, the POWER/STANDBY LED blinks green.



Dry Contact Relay Output



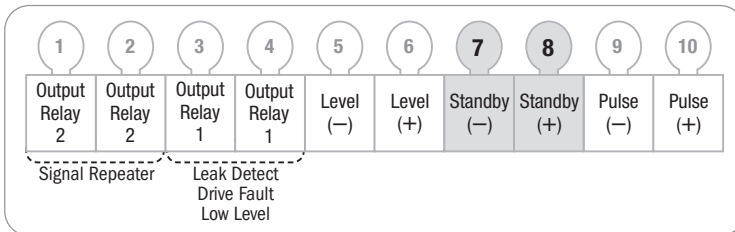
Open Collector Output

For connection to a Dry Contact

- There is no polarity to observe.
- Connect relay to Standby (-), position 7 and Standby (+), position 8.

For connection to an Open Collector

- Polarity must be observed.
- Connect OC positive to Standby (+), position 8.
- Connect OC common to Standby (-), position 7.

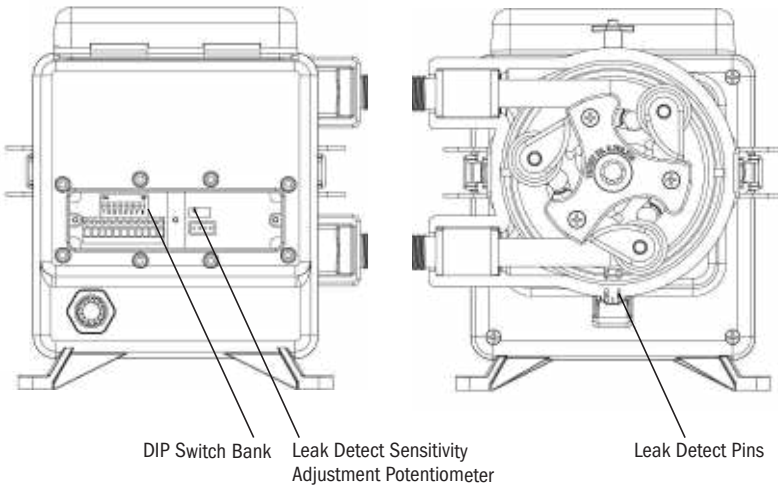


SETTINGS

LEAK DETECT page 1 of 4

The leak detect feature alerts if solution is present in the pump head by sensing the conductivity of the liquid. The sensitivity is factory preset to distinguish between water and common water treatment chemicals. Always calibrate the sensitivity with the chemical and chemical concentration utilized in the application to reduce the number of false tube leaks.

- When a leak is detected the Leak LED is solid red and the pump shuts off unless the DIP Switch setting is set to continue to run the pump. Instruction in LEAK DETECT page 4 of 4.
- To reset the pump, the tube housing, cover and components must be clean & dry and the power must be disconnected and reconnected.
- The sensitivity is adjusted with the potentiometer (brass screw) located under the terminal cover on the back of the pump. Use a small flat blade screwdriver less than 3 mm to turn the potentiometer.




Follow the Leak Detect Sensitivity Calibration steps on the next pages


SETTINGS continued

LEAK DETECT page 2 of 4

CALIBRATE THE LEAK DETECT SENSITIVITY

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

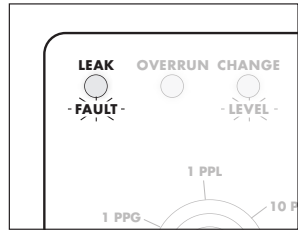
 WARNING Turn off water system, disable all pumps and depressurize the system before performing installation. Always wear proper protective safety equipment when working with metering pumps.

1. Set the pump to .
2. Unplug the pump.
3. Remove tube housing cover from the pump head.
4. Remove the signal cover to allow access to the leak detect adjustment potentiometer.
5. Use a small flat blade screwdriver less than 3 mm and turn the potentiometer clockwise until there is a clicking sound (approx. 25 rotations).
6. Plug the pump in.

SETTINGS continued

LEAK DETECT page 3 of 4

7. Soak a small piece of sponge with the pumping solution and place over the two leak detect pins, use the expected weakest solution and keep in mind some solutions dilute with time.
8. Slowly turn the potentiometer counterclockwise until the LEAK LED blinks red.
9. Turn the potentiometer an additional one full turn counterclockwise.
10. Remove sponge and thoroughly clean the solution off pins and confirm they are dry.
IMPORTANT: Confirm there is no chemical residue remaining on the leak detect pins and bracket.
11. Disconnect, then reconnect power. Confirm the LEAK LED is not lit. If lit, repeat steps 1-11. If the LEAK LED is not lit, go to step 12.
12. If the pump is not outdoors or exposed to water, go to step 14.
13. 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. If the tube LEAK LED is lit, 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 tube the LEAK LED is not lit, the setting is complete.
14. Re-install the tube housing cover and the signal cover on the pump.
15. Prime the pump.
16. Verify pump operation.



SETTINGS continued

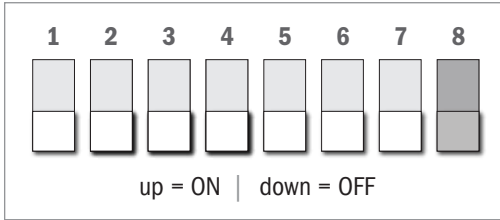
LEAK DETECT page 4 of 4

Set the pump to respond when a leak is detected to either shut off or continue to run.

PUMP SHUTS OFF = Set DIP switch 8 to OFF

PUMP CONTINUES TO RUN = Set DIP switch 8 to ON

The output relay will still close to provide a signal when the pump is shut off or continues to run.



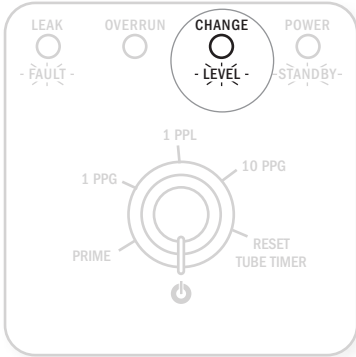
DIP Switch Bank

! Each time the DIP switch settings are changed; unplug the pump, wait 30 seconds, then plug in the pump.

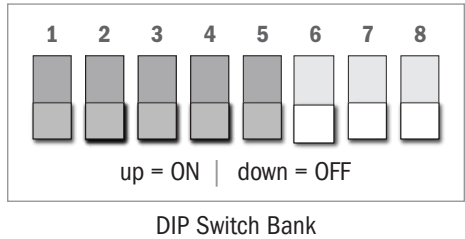
SETTINGS continued

TUBE CHANGE TIMER page 1 of 2

As a part of routine maintenance pump tubes must be replaced at regular intervals according to the specific application. Determine the number of hours you want the pump to run before it indicates a tube change and then set the timer with DIP switches 1-5. When the set time is reached the CHANGE/LEVEL LED indicator is lit solid red.



LED Indicators and Controls



! Each time the DIP switch settings are changed; unplug the pump, wait 30 seconds, then plug in the pump.

The chart on the following page lists all the available run times in 100 hour increments and corresponding DIP switch settings.

SETTINGS continued

TUBE CHANGE TIMER page 2 of 2

Examples

- Pump Run Time 100 hours. Set 1 to ON. Set 2, 3, 4, 5 to OFF.
- Disabled Tube Change Timer: Set 1 through 5 to OFF

| Pump Tube Run Time Hours | Tube Change Timer DIP Switches | | | | |
|-----------------------------|--------------------------------|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 |
| 100 | ON | OFF | OFF | OFF | OFF |
| 200 | OFF | ON | OFF | OFF | OFF |
| 300 | ON | ON | OFF | OFF | OFF |
| 400 | OFF | OFF | ON | OFF | OFF |
| 500 | ON | OFF | ON | OFF | OFF |
| 600 | OFF | ON | ON | OFF | OFF |
| 700 | ON | ON | ON | OFF | OFF |
| 800 | OFF | OFF | OFF | ON | OFF |
| 900 | ON | OFF | OFF | ON | OFF |
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| 2000 | OFF | OFF | ON | OFF | ON |
| 2100 | ON | OFF | ON | OFF | ON |
| 2200 | OFF | ON | ON | OFF | ON |
| 2300 | ON | ON | ON | OFF | ON |
| 2400 | OFF | OFF | OFF | ON | ON |
| 2500 | ON | OFF | OFF | ON | ON |
| 2600 | OFF | ON | OFF | ON | ON |
| 2700 | ON | ON | OFF | ON | ON |
| 2800 | OFF | OFF | ON | ON | ON |
| 2900 | ON | OFF | ON | ON | ON |
| 3000 | OFF | ON | ON | ON | ON |
| 3100 | ON | ON | ON | ON | ON |
| Disabled | OFF | OFF | OFF | OFF | OFF |

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.

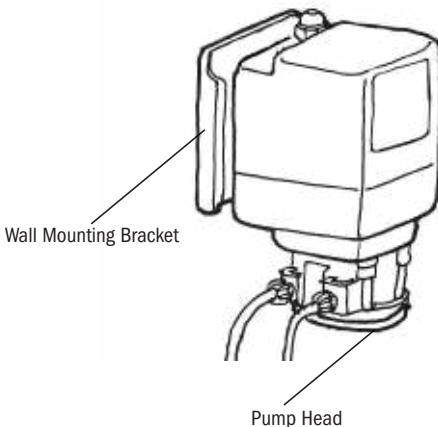


Recommended mounting is vertical with pump head pointed downward or horizontal sitting on motor base.

INSTALLATION continued

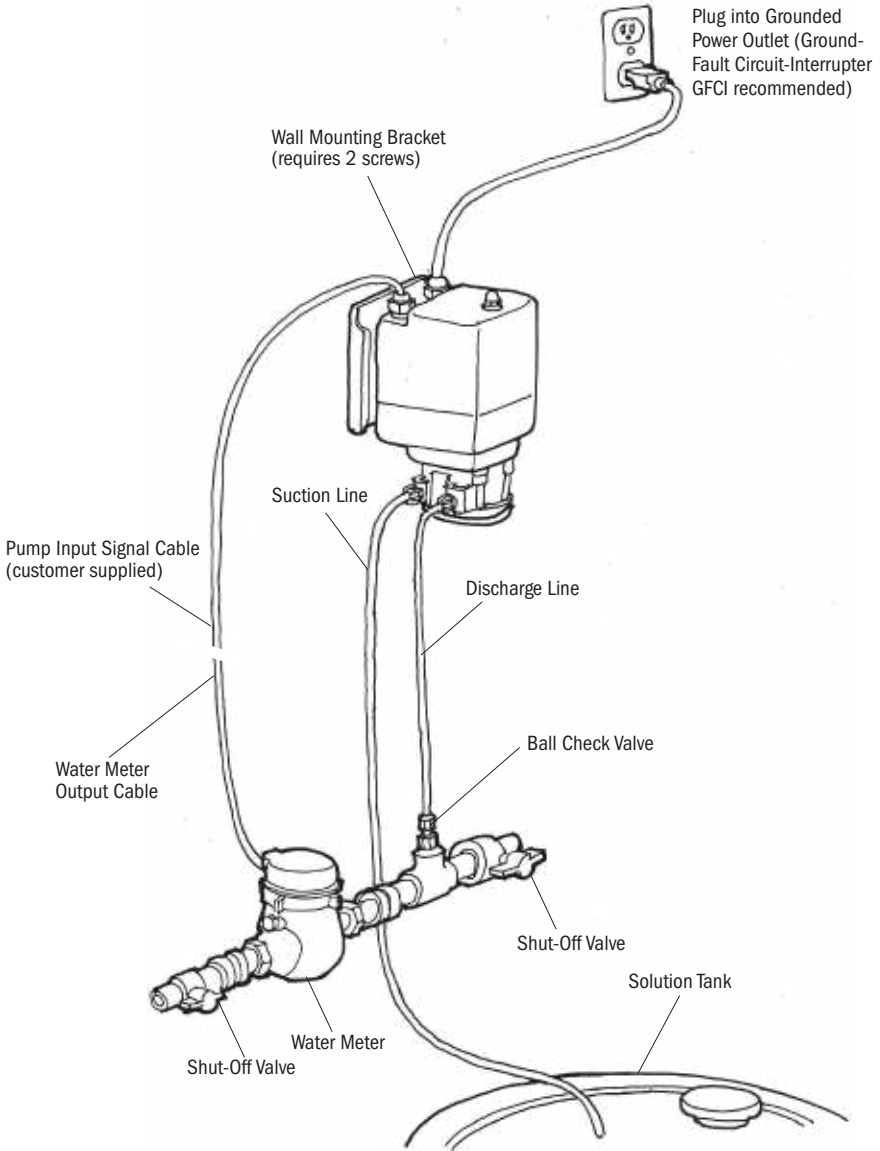
MOUNT PUMP

- ❗ **Recommended mounting is vertical with pump head pointed downward or horizontal sitting on motor base.**
 - ❗ **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.**
 - ❗ **To prevent damage, verify with a volt meter that the receptacle voltage corresponds with the pump voltage.**
 - ❗ **After installation and after the settings are adjusted, be sure to tighten the screw on the cover of the control panel.**



INSTALLATION continued

DIAGRAM



INSTALLATION continued

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.

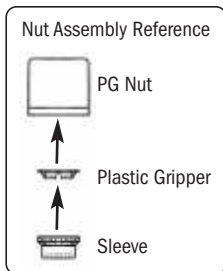
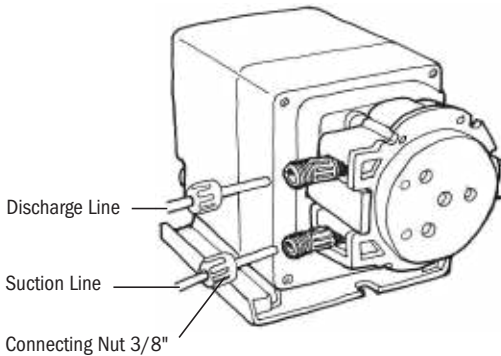
2. Make connections by sliding the line(s) through connecting nut and finger tighten while holding the tube fitting.
3. Wrench tighten the 3/8" connecting nut one additional half turn. If leak occurs, gradually tighten the 3/8" connecting nut as required.



Overtightening the nut may result in damaged fittings and air pick up.



DO NOT use thread seal tape on pump tube connections.



DO NOT use thread seal tape on pump tube threads.

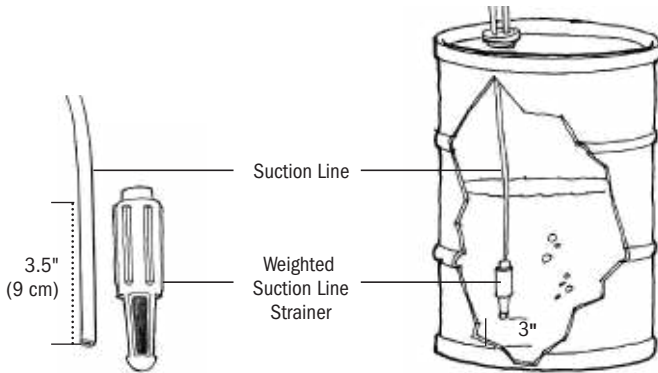
INSTALLATION continued

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.**



INSTALLATION continued

INSTALL DISCHARGE LINE TO PUMP HEAD AND INJECTION POINT

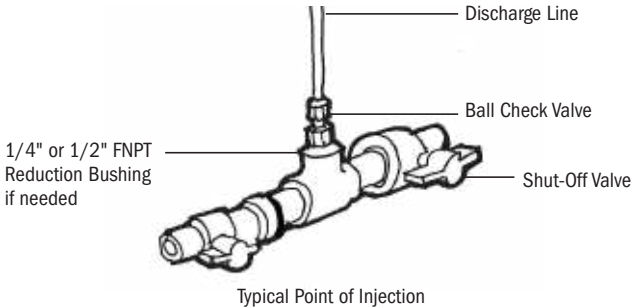
1. Make a secure finger tight connection on the discharge fitting of the pump head as instructed in Install Suction Line instructions.

! DO NOT use thread seal tape on pump tube connections.

⚠ **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.

INSTALLATION continued

4. Hand tighten the injection fitting into the FNPT fitting
 - a. Prior to connection, test ball check valve and NPT threads for leaks by pressurizing system. If necessary, tighten an additional 1/4 turn.
 - b. Install connecting nut to the pump discharge line. Insert discharge line into check valve body until it reaches base of body.
 - c. Finger tighten connecting nut to fitting then wrench tighten the connecting nut one additional turn. If a leak occurs, gradually tighten the connecting nut as required.
 5. Prime the pump, turn the potentiometer to PRIME. After 5 seconds, pump runs for 60 seconds and stops. To initiate another prime cycle, turn the potentiometer to  for 5 seconds and then turn it back to the PRIME setting. When sufficiently primed, turn the potentiometer to the desired pulse setting.
 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.
-  **Regular cleaning of the check valve is needed to ensure proper functioning. Remove, inspect and clean components at every pump tube replacement. Replace components at least annually.**
-  **To allow quick access to the point of injection, installation of shut-off valves is recommended .**


TROUBLESHOOTING – MOTOR



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 |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power LED is not on | No power cord connection point Failed power supply Pump requires re-initialization | Check voltage of receptacle/controller output voltage Return to factory for evaluation Disconnect, then reconnect power to pump |
| Pump flow rate output is higher or lower than expected | Pump is set to an incorrect pulse rate | Ensure pump pulse rate setting matches water meter pulse rate. |
| Pump cycles ON/OFF | Failed fan High ambient temperature | Return to factory for evaluation The ambient temperature rating is 104°F (40°C). |
| Display is working, pump is not | Uncertain cause Failed motor Pump is in standby Leak/Fault LED is lit | Disconnect, then reconnect power to pump Return to factory for evaluation Ensure that potentiometer isn't set to  and pump isn't receiving contacts on terminals 7 and 8 Clear Leak/Fault LED according to instructions |
| Relay does not close or open for given condition | Relay output wired incorrectly | Output relays are dry contact and do not provide any voltage; confirm wiring is correct |
| Leak detect not working | Leak detect parts have chemical or residue on them or are not making contact or are missing Leak detect sensitivity was calibrated incorrectly | Install leak detect components; check to ensure pins are clean and making contact Follow the leak detect sensitivity calibration instructions |

TROUBLESHOOTING – PUMP HEAD


| PROBLEM | POSSIBLE CAUSE | SOLUTION |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Components cracking | Chemical attack | Check chemical compatibility |
| Pump head leaking | Pump tube rupture | Replace tube according to instructions |
| No pump output, pump head rotates | Depleted solution tank Pump suction line weight is above solution Leak in the suction line Sleeve and/or plastic gripper inside 3/8" connecting nut is missing, damaged, or incorrectly assembled Injection point is clogged Clogged suction and/or discharge line and/or ball check valve Life of roller assembly exhausted Life of pump tube exhausted Suction line is flush with the nose of the weighted strainer | Replenish solution Maintain suction line 2-3" above bottom of tank Inspect or replace suction line If damaged or missing, replace entire 3/8" connecting nut; beveled end of gripper faces nut; wider end of sleeve faces gripper Inspect and clean injection point Clean and/or replace as needed Replace roller assembly Replace tube according to instructions Pull suction line approximately 1" from bottom of strainer, cut bottom of suction line at an angle |
| Low pump output, pump head rotates | Life of pump tube exhausted Life of roller assembly exhausted Injection point is restricted High system back pressure | Replace tube, according to instructions Replace roller assembly Inspect and clean injection point Verify system pressure against tube psi, replace tube if needed according to instructions |
| No pump output, pump head doesn't rotate | Stripped roller assembly Motor problem | Replace roller assembly Refer to motor section |
| Pump output high | Selected pulse rate does not match water meter Roller assembly broken | Set potentiometer to pulse rate to match water meter pulse rate Replace roller assembly |



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.







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 | <p>Pump tube ruptured</p> <p>Calcium or mineral deposits</p> <p>Excessive back pressure</p> <p>Tube is twisted</p>  | <p>Replace pump tube according to instructions</p> <p>Clean injection fitting, replace tube</p> <p>Verify system pressure against tube psi, if needed replace tube according to instructions</p> <p>Replace tube according to instructions</p> <p>IMPORTANT: DO NOT TWIST THE TUBE during installation. To ensure it doesn't twist, keep the tube positioned so the <u>printed description</u> stays aligned along the length of the tube. Use your fingers to center the tube on the rollers.</p> |
| Tube life is shortened | <p>Chemical attack</p> <p>Mineral deposits at injection point</p> <p>Sediment blockage at check valve</p> <p>Tube manually stretched or pinched during replacement</p> <p>Seized rollers caused abrasion on tube</p> <p>Exposure to heat or sun</p> | <p>Check chemical compatibility</p> <p>Remove deposits, replace pump tube</p> <p>Clean injection fitting, ensure suction line is 2-3" above bottom of tank.</p> <p>Follow tube replacement instructions</p> <p>Clean roller assembly or replace</p> <p>Do not store tubes in high temperatures or in direct sunlight</p> |
| Tube connection is leaking | <p>Sleeve and/or plastic gripper inside 3/8" connecting nut is missing or damaged</p> <p>Incorrect orientation of sleeve and/or plastic gripper inside 3/8" connection nut</p> | <p>Replace entire 3/8" connecting nut</p> <p>Beveled end of gripper should face nut; wider end of sleeve should face gripper</p> |

TUBE REPLACEMENT – SAFETY INFORMATION



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.
-  Consult chemical manufacturer and SDS sheet for additional information and precautions for the chemical in use.
-  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.






CAUTION PINCH POINT HAZARD

-  Use extreme caution when replacing pump tube. Be careful of your fingers and **DO NOT** place fingers near rollers.

WARNING HAZARDOUS PRESSURE/CHEMICAL EXPOSURE

-  Use caution and bleed off all resident system pressure prior to attempting service or installation.
-  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™ 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 ball check valve for blockages after any tube rupture. Clear or replace as required.

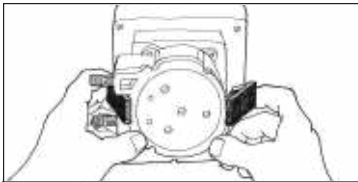
TUBE REPLACEMENT continued

PREPARATION

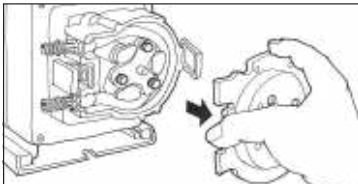
1. Follow all safety precautions prior to tube replacement.
2. Prior to service, pump water or a compatible buffer solution through the pump and suction and discharge lines to remove chemical and avoid contact.

REMOVE THE PUMP TUBE

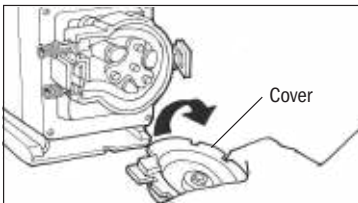
The S128 Medicator has stainless steel latches, plastic latches are shown in the illustrations.



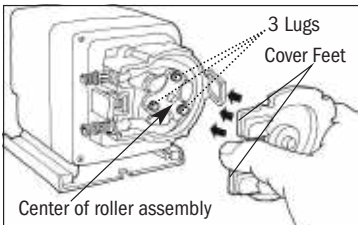
A Open latches



B Remove cover



C Invert cover



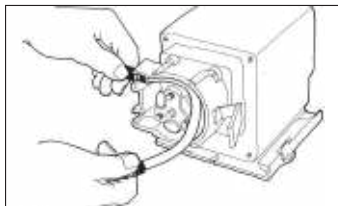
D Align cover feet near tube fitting

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 latches on both sides of the head. *Illustration A*
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 must be collapsed to remove the tube.

TUBE REPLACEMENT continued

REMOVE THE PUMP TUBE



E Remove tube



F Check rollers

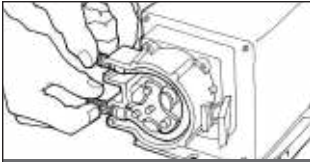
6. Collapse the roller assembly. Hold the motor securely with one hand. With the other hand, hold the tube housing cover with your forefingers inside the top lip of the cover. Use the cover as a wrench and with your palm quickly (snap) rotate the cover counterclockwise to collapse the roller assembly.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



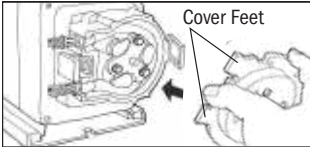
7. Remove and discard the pump tube. *Illustration E*
8. Remove the roller assembly and housing. Set them aside to re-install later.
9. Use a non-citrus all-purpose cleaner to clean chemical residue from all pump components.
10. Check the housing for cracks. Replace if cracked.
11. Ensure the rollers 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 F*
12. Reinstall clean tube housing.
13. Apply AquaShield™ to the shaft tip.
14. Install the roller assembly.

TUBE REPLACEMENT continued

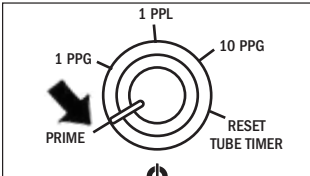
INSTALL THE TUBE/EXPAND THE ROLLER ASSEMBLY



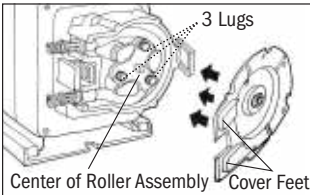
G Place new tube



H Install cover feet first



I Turn potentiometer to PRIME



J Align cover feet near bottom

1. Ensure the power to the pump is off and the input signal is disconnected.
2. Install tube and use fingers to center the tube on the rollers. *Illustration G*



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.

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 H*
4. Plug the pump in. Turn the potentiometer to PRIME, allow the pump to run the roller assembly in its collapsed position for four minutes in total to relax tube. Pump runs for 60 seconds for each PRIME cycle. *Illustration I*
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 tube fittings. *Illustration J*
NOTE: The roller assembly needs to be expanded so the tube is pressed against the tube housing wall.

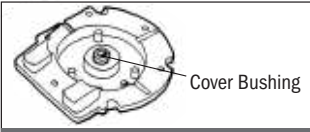
TUBE REPLACEMENT continued

INSTALL THE TUBE/EXPAND THE ROLLER ASSEMBLY continued

IMPORTANT: THE ROLLER ASSEMBLY MUST BE EXPANDED so the tube is pressed against the tube housing wall.



K Expand roller assembly





L Apply Aquashield™ to cover bushing


- 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 K*
- 9.** Apply a small amount of AquaShield™ to the cover bushing **ONLY**. **DO NOT** lubricate the pump tube. *Illustration L*
- 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 H*
- 11.** Reconnect the suction and discharge lines.
- 12.** Prime the pump and verify operation.
- 13.** Set pump to desired pulse rate.

CLEANING THE POINT OF INJECTION – SAFETY INFORMATION


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


 **NOTICE:** Injection ball check valve has an extension tip to be installed in the center of the pipe directly in the flow of water to help reduce deposit accumulation.


 **WARNING** Warns 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.

 **WARNING** HAZARDOUS PRESSURE/CHEMICAL EXPOSURE

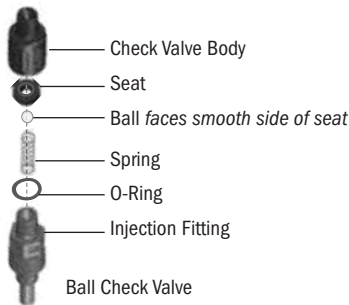
 Use caution and bleed off all resident system pressure prior to attempting service or installation.

 Use 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. Disconnect power. Disable any water pump or auxiliary equipment electrical supply.
2. Depressurize system and bleed pressure from pump discharge line.
3. Loosen and remove connecting nut from the ball check valve to disconnect discharge line.
4. Unscrew the check valve body (top fitting) and remove the ball check components. Be careful to not stretch or damage the spring.
5. Inspect and replace parts as needed.
6. Insert a #2 Phillips head screwdriver through the injection fitting 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.
7. Replace discharge line if cracked, deteriorated, or clogged. If the end is clogged, cut off the calcified or blocked section of discharge line.
8. Reassemble the check valve, refer to the illustration. The ball must face the smooth side of the seat.
9. Reinstall the discharge line to the ball check valve approximately 3/4" until it stops.
10. 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.
11. 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.
12. Put the metering pump back into service and inspect all connections for leaks.



PUMP HEADS, PARTS & SERVICE KIT

Pump Heads

60 psi (4.1 bar) max. Includes S4QP pump head and tube

| PART NUMBER | UM | DESCRIPTION |
|-------------|------|--------------------------------------|
| S4108X-1 | EA | S4QP Pump Head; #8X Santoprene® tube |
| S4108X-2 | 2-PK | |

Pump Heads Parts

| 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 | |

Service Kit

60 psi (4.1 bar) max. Includes S4QP roller assembly, tube, 3/8" nuts

| PART NUMBER | UM | DESCRIPTION |
|-------------|-----|--------------------------------------------------|
| S4108XK | KIT | S4QP Pump Head Service Kit; #8X Santoprene® tube |

NOTE: Confirm material compatibility with the chemical resistance guide.

PUMP TUBES & BALL CHECK VALVE

Pump Tubes

| PART NUMBER | UM | DESCRIPTION |
|-------------|------|----------------------|
| S4008X-2 | 2-PK | #8X Santoprene® tube |
| S4008X-5 | 5-PK | |

Ball Check Valve

| PART NUMBER | UM | DESCRIPTION |
|-------------|----|-------------------------------------------------------------------------------------------|
| BC038-1 | EA | 3/8" Ball Check Valve includes FKM seat & O-ring, tantalum spring, nut |
| BC238-1 | EA | 3/8" Ball Check Valve includes EPDM seat, Santoprene® O-ring, stainless steel spring, nut |

NOTE: Confirm material compatibility with the chemical resistance guide.

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

 **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% | A | B | B | A | B | A | A | A |
| Acetic Acid 30% | B | C | C | A | B | A | A | B |
| Acetic Acid, Glacial | C | C | C | C | C | • | A | A |
| Acetic Anhydride | B | C | C | C | C | C | • | A |
| Aliphatic Hydrocarbons | B | B | B | B | • | • | • | • |
| Aluminum Chloride | A | A | A | B | A | B | A | B |
| Aluminum Sulfate | A | A | A | A | A | A | A | B |
| Alums | A | A | A | A | A | A | • | A |
| Ammonium Acetate | B | B | A | A | A | • | • | A |
| Ammonium Carbonate | A | A | A | A | A | C | • | B |
| Ammonium Chloride | A | B | A | B | A | C | A | B |
| Ammonium Hydroxide | A | B | A | A | B | A | B | A |
| Ammonium Nitrate | A | A | A | A | B | C | A | A |
| Ammonium Phosphate | A | A | A | A | A | A | • | C |
| Ammonium Sulfate | A | A | A | A | B | A | A | B |
| Amyl Acetate | A | C | C | C | C | C | • | A |
| Aniline | B | C | C | C | C | C | A | B |
| Antimony Salts | A | A | A | B | • | • | • | • |
| Arsenic Salts | A | A | A | B | • | • | • | • |
| Barium Hydroxide | A | A | A | B | A | • | B | B |
| Barium Salts | A | • | A | B | • | A | • | • |
| Beer | A | A | A | A | A | • | A | A |
| Benzene | C | C | C | C | B | • | • | B |
| Benzoic Acid | A | C | A | A | A | • | A | B |
| Bleach 5.25% | A | A | A | A | A | • | • | • |
| Boric Acid | A | A | A | A | A | A | A | A |
| Bromine | A | B | B | B | A | C | A | C |
| Butyl Acetate | A | C | C | C | C | C | • | A |
| Butyric Acid | A | C | B | C | B | C | A | B |
| Calcium Chloride | A | A | B | A | A | • | A | B |
| Calcium Hydroxide | A | C | A | A | A | • | B | B |

CHEMICAL RESISTANCE GUIDE continued

| Chemical / Solution | PP Santoprene® EPDM | Versilon® | PVC | LDPE | FKM | Silicone | Tantalum | Stainless Steel |
|-----------------------------------------|---------------------------|-----------|-----|------|-----|----------|----------|--------------------|
| Calcium Hypochlorite 5% | A | B | A | A | A | • | A | B |
| Calcium Salts | A | A | A | A | • | B | • | • |
| Carbon Disulfide | C | C | C | C | A | • | • | B |
| Carbon Tetrachloride | C | C | C | C | A | C | • | B |
| Castor Oil | B | A | A | • | A | • | • | A |
| Chlorine <i>see Sodium Hypochlorite</i> | | | | | | | | |
| Chloroacetic Acid | A | C | B | C | C | • | • | A |
| Chloroform | C | C | C | C | A | C | • | A |
| Chlorosulfonic Acid | B | C | C | C | C | C | • | B |
| Chromic Acid < 50% | B | C | B | A | A | C | A | B |
| Chromium Salts | A | • | A | B | • | • | • | • |
| Citric Acid | B | B | B | C | A | • | A | A |
| Copper Chloride | A | A | A | A | A | • | A | C |
| Copper Sulfate | A | A | A | A | A | • | A | B |
| Cottonseed Oil | B | A | B | A | A | • | • | A |
| d-Limonene | C | B | B | B | A | C | • | • |
| Ethyl Acetate | A | C | C | C | C | B | • | B |
| Ethyl Alcohol | B | C | C | B | B | • | A | • |
| Ethyl Chloride | C | C | C | C | A | C | • | A |
| Ethylene Dichloride | C | C | C | C | A | C | • | B |
| Ethylene Glycol | A | A | A | A | A | A | • | B |
| Ethylene Oxide | B | A | C | C | C | C | • | B |
| Eucalyptus Oil | C | B | C | C | • | • | • | • |
| Fatty Acids | C | B | A | A | A | C | • | A |
| Ferric Chloride | A | A | A | A | A | B | A | C |
| Ferric Sulfate | A | A | A | A | A | B | • | B |
| Ferrous Chloride | A | A | A | A | A | C | • | C |
| Ferrous Sulfate | A | A | A | A | A | C | • | B |
| Fluoboric Acid | A | C | A | C | B | A | • | • |
| Fluosilicic Acid | A | A | A | A | A | C | • | B |
| Formaldehyde < 40% | A | B | A | C | C | B | • | A |
| Formic Acid | A | C | B | C | C | C | A | A |
| Glucose | A | A | A | A | A | A | • | A |
| Glycerin | A | A | A | A | A | A | • | A |
| Hydrochloric Acid 20% | A | C | A | A | A | C | A | C |
| Hydrochloric Acid 37% | A | C | A | A | A | C | A | C |
| Hydrocyanic Acid | A | B | A | A | A | C | A | A |
| Hydrofluoric Acid < 48% | A | C | B | A | A | C | C | C |
| Hydrofluoric Acid 48-75% | A | C | C | C | A | C | C | C |
| Hydrofluoric Acid, anhydrous | B | C | C | C | C | • | C | C |
| Hydrogen Peroxide < 50% | A | B | A | B | A | A | A | A |
| Hydrogen Sulfide | A | A | B | A | C | • | • | A |

CHEMICAL RESISTANCE GUIDE continued

| Chemical / Solution | PP Santoprene® EPDM | Versilon® | PVC | LDPE | FKM | Silicone | Tantalum | Stainless Steel |
|--------------------------|---------------------------|-----------|-----|------|-----|----------|----------|--------------------|
| Iodine | A | A | C | B | A | C | A | C |
| Lactic Acid | A | B | B | A | A | A | A | B |
| Lead Acetate | B | A | A | A | C | C | • | B |
| Linseed Oil | B | A | A | A | A | A | • | A |
| Limonene | C | B | B | B | A | C | • | • |
| Lubricating Oils | C | A | B | C | A | • | • | A |
| Magnesium Chloride | A | A | B | A | A | A | A | C |
| Magnesium Hydroxide | A | A | A | A | A | • | A | A |
| Magnesium Sulfate | A | A | A | A | A | A | A | B |
| Malic Acid | A | B | A | A | A | B | • | A |
| Manganese Salts | A | A | A | A | • | B | • | • |
| Mercuric Chloride | A | A | A | A | A | • | • | C |
| Methylene Chloride | C | C | C | C | B | • | A | B |
| Mineral Oil | B | A | B | B | A | • | • | • |
| Mineral Spirits | C | A | B | B | A | • | • | A |
| Muriatic Acid, 20° Baume | A | C | A | A | A | • | • | • |
| Nitric Acid < 10% | A | C | A | B | A | B | A | A |
| Nitric Acid 10-30% | B | C | A | C | A | C | A | A |
| Nitric Acid 30-60% | C | C | B | C | A | C | A | A |
| Nitric Acid 70% | C | C | B | C | A | C | A | A |
| Nitric Acid, red fuming | C | C | C | C | C | C | • | • |
| Nitrous Acid | A | B | • | • | B | • | • | B |
| Oleic Acid | A | B | C | C | B | C | • | A |
| Oleum 20-25% | C | C | C | C | • | • | • | B |
| Oxalic Acid | A | C | B | A | A | C | A | A |
| Palmitic Acid | A | B | B | A | A | C | • | A |
| Petroleum Distillates | C | B | B | C | • | • | A | A |
| Peracetic Acid 5% | B | B | B | A | A | A | • | • |
| Peracetic Acid 15% | B | B | B | A | A | B | • | • |
| Phenol | B | C | C | B | A | C | • | B |
| Phosphoric Acid | A | C | A | A | A | C | A | C |
| Phthalic Acid | A | C | A | A | A | B | • | A |
| Pickling Solutions | A | C | • | • | B | • | • | • |
| Plating Solutions | A | C | • | • | A | C | • | • |
| Polyphosphate | A | A | A | A | • | • | • | • |
| Potassium Carbonate | A | A | A | A | A | • | • | B |
| Potassium Chlorate | A | A | A | A | A | B | • | B |
| Potassium Hydroxide | A | A | A | A | C | C | B | A |
| Potassium Dichromate | A | A | A | A | A | • | • | B |
| Potassium Iodide | A | A | B | B | A | • | • | A |
| Potassium Permanganate | A | A | A | A | A | • | • | B |
| Sea Water | A | A | A | A | A | • | A | C |

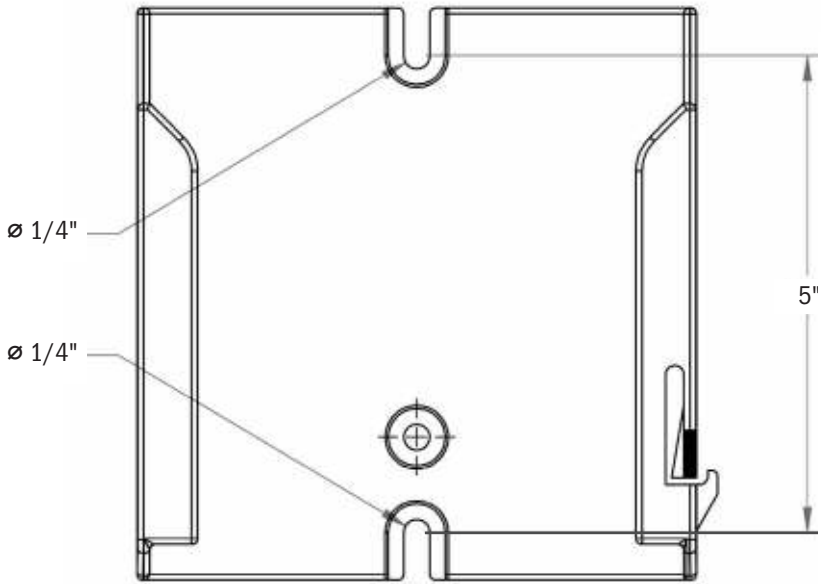
CHEMICAL RESISTANCE GUIDE continued

| Chemical / Solution | PP Santoprene® EPDM | Versilon® | PVC | LDPE | FKM | Silicone | Tantalum | Stainless Steel |
|---------------------------|---------------------|-----------|-----|------|-----|----------|----------|-----------------|
| Silicone Oil | C | A | A | B | A | C | • | A |
| Silver Nitrate | A | A | A | A | A | A | • | B |
| Soap Solutions | A | A | A | C | A | A | • | A |
| Sodium | A | A | A | A | • | • | • | • |
| Sodium Bisulfate | A | A | A | A | A | • | • | C |
| Sodium Bisulfite | A | A | A | A | A | A | • | B |
| Sodium Borate | A | A | A | A | A | A | • | B |
| Sodium Carbonate | A | A | A | A | A | A | • | A |
| Sodium Chlorate | A | A | A | A | A | C | • | B |
| Sodium Chloride | A | A | A | A | A | A | A | B |
| Sodium Dichromate 20% | A | • | B | • | A | • | • | • |
| Sodium Hydroxide < 20% | A | B | A | B | C | A | B | B |
| Sodium Hydroxide 20-46.5% | A | C | A | B | C | • | C | B |
| Sodium Hypochlorite 5% | A* | B | A | A | A | B | A | C |
| Sodium Hypochlorite 6-15% | A* | B | A | A | A | B | A | C |
| Sodium Nitrate | A | A | A | A | A | C | A | B |
| Sodium Silicate | A | A | A | A | A | A | • | B |
| Sodium Sulfide | A | A | A | A | A | A | • | C |
| Sodium Sulfite | A | A | A | A | A | A | • | A |
| Solvents | C | B | B | B | • | • | • | • |
| Soybean Oil | B | A | A | A | A | • | • | A |
| Stannous Chloride 15% | A | A | A | B | A | • | • | A |
| Stearic Acid | A | B | B | B | A | B | • | A |
| Sulfur Dioxide liquid | A | C | C | C | B | • | • | A |
| Sulfur Trioxide | B | C | A | C | A | • | • | C |
| Sulfuric Acid < 40% | B | B | B | B | A | C | A | C |
| Sulfuric Acid > 40% | C | C | C | C | A | C | A | C |
| Sulfurous Acid | A | A | A | B | C | C | • | B |
| Tannic Acid 10% | A | B | A | B | A | B | • | A |
| Tanning Liquors | A | A | A | A | A | • | • | A |
| Tartaric Acid | A | A | A | A | A | A | • | C |
| Titanium Salts | A | A | A | B | • | • | • | • |
| Triethanolamine | A | C | C | C | C | • | • | • |
| Trisodium Phosphate | A | A | A | A | A | • | • | B |
| Tung Oil | B | B | C | C | A | • | • | • |
| Turpentine | B | B | C | C | A | C | • | A |
| Urea | B | A | B | A | A | B | • | B |
| Water & Brine | A | A | A | A | A | B | • | • |
| Zinc Chloride | A | A | B | A | A | A | A | B |
| Zinc Salts | A | A | A | A | • | • | • | • |

NOTE: FKM tested to ANSI/NSF 61 with water only.

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

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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