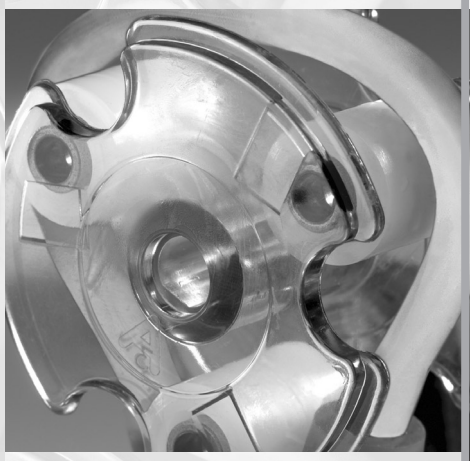
Classic Series INSTALLATION AND MAINTENANCE MANUAL

RELIABLE CHEMICAL FEED PUMPS SINCE 1957



STENNER

OPERATING REQUIREMENTS

SAFETY INSTRUCTIONS

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

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

⚠ **ELECTRIC SHOCK HAZARD**

NOTICE: Indicates special instructions or general mandatory action.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS!

GENERAL SAFETY HAZARDS AND NOTICES

⚠ **⚠ WARNING ELECTRIC SHOCK HAZARD:**
Pump supplied with grounding power cord and attached plug. To reduce risk of electrical shock, connect only to a properly grounded, grounding type receptacle.

⚠ **⚠ AVERTISSEMENT RISQUE DE CHOC ELECTRIQUE:**
Cette pompe est équipée d'une fiche de mise à terre. Pour réduire le risque de choc électrique, s'assurer que la fiche est bien raccordée à une prise de courant avec une connexion de mise à terre.

⚠ **DO NOT** alter the power cord or plug end.

⚠ **DO NOT** use receptacle adapters.

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

⚠ **PUMP INTENDED FOR INDOOR USE.**

⚠ Cette pompe est prévue pour utilisation à l'intérieur.

⚠ **PUMP SUITABLE FOR USE OUTDOORS** when installed with a Stenner Rain Roof Part No. MP90000.

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

⚠ **⚠ WARNING HAZARDOUS VOLTAGE:**
DISCONNECT power cord before removing motor cover for service. **Electrical service by trained personnel only**.

⚠ **⚠ WARNING EXPLOSION HAZARD:**
This pump **is not** explosion proof. **DO NOT** install or operate in an explosive environment.

⚠ **⚠ WARNING RISK OF FIRE HAZARD:**
DO NOT install or operate on any flammable surface.

⚠ **⚠ WARNING RISK OF CHEMICAL EXPOSURE:**
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.

THE FOLLOWING SAFETY HAZARDS AND NOTICES APPLY TO METERING PUMPS THAT CARRY THE "ETL SANITATION" LISTING, CONFORM TO NSF-STD 50, AND ARE LISTED FOR USE IN POOLS AND SPAS.

⚠ WARNING RISK OF CHEMICAL OVERDOSE:
To reduce risk, follow proper installation methods and recommendations. Check your local codes for additional guidelines.

⚠ Removing power from pool/spa recirculation pump must also remove power from pump.

⚠ The use of an auxiliary safety device (not supplied), such as a flow switch or sensor, is recommended to prevent feed pump operation in the event of a recirculation pump failure or if flow is not sensed.

⚠ Point of chemical injection should be beyond all pumps, filters, and heaters.

⚠ 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.

NOTICE: 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.

NOTE: 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.

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

OPERATING REQUIREMENTS

ADDITIONAL PRECAUTIONS AND NOTICES

- **DO** check supply voltage prior to connecting power cord to prevent motor damage.
- **DO** mount the pump in a dry location to avoid water intrusion and pump damage.
- **DO** install pump so that it is in compliance with all national and local plumbing and electrical codes.
- **DO** install pump to work in conjunction with pool, spa, well pump, or system controls.
- **DO** use the proper product to treat potable water systems, use **only** chemicals listed or approved for use with potable water.
- **DO** install the pump vertically, with the pump head pointed downward and the spill recovery in place to reduce the risk and severity of leakage.
- **DO** use all required personal protective equipment when working on or near chemical metering pumps.
- **DO** pump generous amounts of clean water or a compatible buffer solution through pump prior to service, storage, or shipping.
- **DO NOT** attempt installation or service prior to reading and understanding all safety hazards. This equipment is designed for installation and service by trained personnel.
- **DO NOT** use thread sealant tape on pump tube connections or tools to tighten connections.
- **DO NOT** apply grease, oil, or lubricants to the pump tube or pump housing.
- **DO NOT** mount pump vertically with pump head up. This will help to prevent pump damage in the event of a leaking pump tube.
- **DO NOT** mix chemicals in the solution container. Follow recommended mix procedures as provided by the manufacturer.
- **DO NOT** operate pump unless chemical is completely in solution. Turn metering pump off when replenishing solutions.
- **DO NOT** install pump directly above an open solution container. Chemical fumes can damage the pump.
- **DO NOT** allow water intrusion of the motor. Corrosion and damage will occur.

PRE-INSTALLATION INSTRUCTIONS

1. Verify metering pump model and voltage requirements.
2. Unpack pump and all box contents. Separate contents to verify all items have been received.

Accessories included with each metering pump are based on pressure rating (25 or 100 psi) and suction/discharge tubing size (1/4", 3/8", 6mm).

25 psi unit includes:	**100 psi unit includes:**
(3) Connecting Nuts (1/4" or 3/8")	(3) Connecting Nuts (1/4" or 3/8")
(3) Ferrules w/1/4" & 6mm or (2) ferrules w/3/8"	(3) Ferrules w/1/4" & 6mm or (2) ferrules w/3/8"
(1) Injection Fitting	(1) Injection Check Valve
(1) Ceramic weight with clip	(1) Ceramic weight with clip
(1) 20' roll of suction & discharge tubing 1/4" or 3/8" white or UV black OR 6mm (Europe) white	(1) 20' roll of suction & discharge tubing 1/4" or 3/8" white or UV black OR 6mm (Europe) white
(1) Spare pump tube	(1) Spare pump tube
(1) Installation and Maintenance Manual	(1) Installation and Maintenance Manual

3. Read the Installation and Maintenance Manual before beginning the installation.

Storage Suggestions

When your metering pump is not in use, we recommend that you:

- **Run fresh water through pump to rinse chemical from pump tube and allow to run dry.**
- **Rinse off and wipe clean chemical residue or debris from tube housing and roller assembly to avoid corrosion.**
- **Store pump and pumping tubes in a non-corrosive environment and dry location to avoid possible water intrusion.**
- **Do not store pump tubes on chemical tank, in the pump room, or direct sunlight.**

PRODUCT SPECIFICATIONS

System output is determined by motor RPM and pump tube size, as well as by the setting of the feed rate control. In addition, Stenner chemical metering pumps are available as low-pressure or high-pressure models (0-25 psi=low pressure, 26-100 psi=high pressure).

Classic Series

U.S. Gallon Ranges:

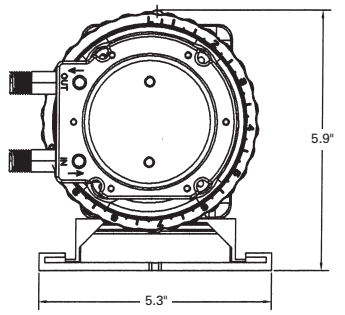
Series 45 . . . . . 0.2-50 GPD
Series 85 . . . . . 0.3-85 GPD
Series 100 . . . . . 0.3-100 GPD
Series 170 . . . . . 0.5-170 GPD

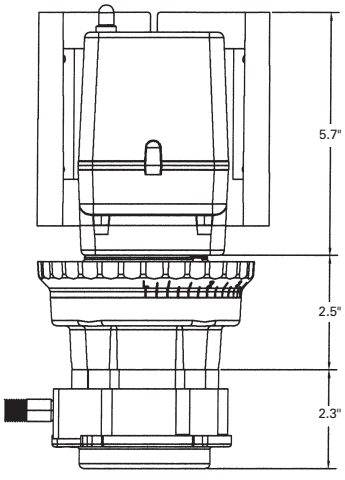
Note: Max GPD for pressures 26-100 psi is 40 gallons. Contact factory for details.

Metric Ranges:

Series 45 . . . . . 0.6-151.4 LPD
Series 85 . . . . . 0.9-257.4 LPD
Series 100 . . . . . 0.9-302.8 LPD
Series 170 . . . . . 1.5-514.8 LPD

Note: Max LPD for pressures 1.72 bar to 6.9 bar is 121.1 liters per day. Contact factory for details.





For double head adjustable models, add pump head (dimensions).
For dual head/dual control, add feed rate control and pump head (dimensions).

Specifications:

Discharge Pressures . . . . . 0-100 psi; 0-6.9 bar
Output Ranges . . . . . 0.2-170 gallons/day;
. . . . . 0.6-514.8 liters/day
Turndown Ratio . . . . . (adjustable models)
. . . . . 20:1, 5% to 100%
. . . . . in 2.5% increments
Voltages Available 120VAC 60Hz; 220VAC 60Hz;
. . . . . 230VAC 50Hz *International*;
. . . . . 250VAC 50Hz *International*
Motor RPM . . . . . 26 (45 & 100 series);
. . . . . 44 (85 & 170 series)
Amp Draw 1.70 120VAC; 0.9 220VAC,
. . . . . 230VAC, 250VAC
Horsepower . . . . . 1/30 fractional
Connections . . . . . 1/4", 3/8" or 6mm
. . . . . suction/discharge tubing
Shipping Weight . . . . . 6 lbs (2.72 kg)-single head, fixed
. . . . . 8 lbs (3.63 kg)-single head adjustable
. . . . . 8.5 lbs (3.85 kg)-double head, fixed
. . . . . 9 lbs (4.08 kg)-double head, adjustable
. . . . . 10 lbs (4.53 kg)-dual head/dual control
Operating Temperature . . . . Maximum 125 degrees Fahrenheit/
. . . . 51.6 degrees Celsius

Materials of Construction:

All Housings* . . . . . Lexan® Polycarbonate Plastic

Peristaltic Tube** . . . . . Santoprene® FDA Approved
Check Valve Duckbill

Suction/Discharge Tubing . . LDPE Polyethylene-NSF/FDA Approved
Ferrules(1/4" & 6mm)

Tube Fittings . . . . . Type 1 Rigid PVC-NSF Listed
Connecting Nuts
Check Valve Fittings
Ceramic Weight Clip

Suction Weight . . . . . Ceramic

All Fasteners . . . . . Stainless Steel

* Lexan® is a registered trademark of General Electric. Consult General Electric for chemical resistance of Lexan®.

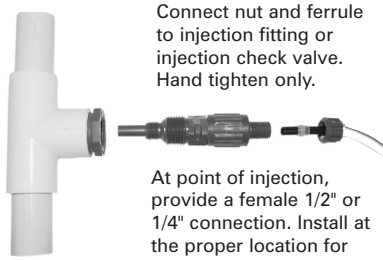
**Santoprene® is a registered trademark of Advanced Elastomer System. Refer to chemical resistance chart in Stenner catalog for material compatibility.

Materials for all wetted parts have been tested and approved for potable water applications.

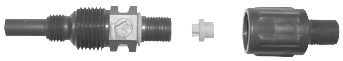
Discharge Side

Shut off water supply.

Connect nut and ferrule to injection fitting or injection check valve. Hand tighten only.



At point of injection, provide a female 1/2" or 1/4" connection. Install at the proper location for your application.



NOTICE: The use of an injection check valve as shown above is required in all high-pressure applications (26 to 100 psi - 1.73 to 6.9 bar).

To prevent leaks, all the ferrules must be installed as illustrated.

Cut suction/discharge tubing to desired length with enough slack to avoid kinks.

Connect nut, ferrule, and discharge tubing to the discharge side of the pump head (labeled “out” on cover of head). Finger tight only. Do not use thread seal tape.

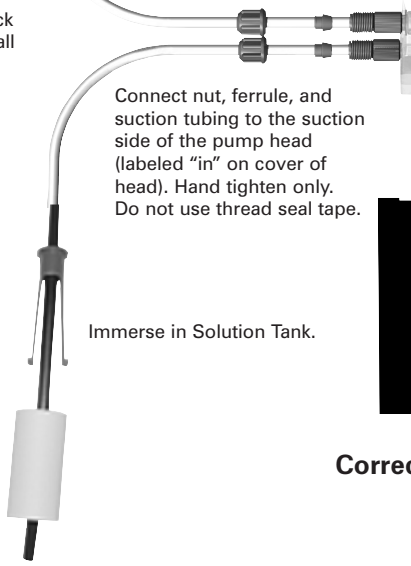
Connect nut, ferrule, and suction tubing to the suction side of the pump head (labeled “in” on cover of head). Hand tighten only. Do not use thread seal tape.

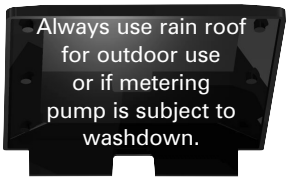
Suction Side

Run the suction tubing to the solution tank. Allow for some slack in the tube to avoid kinks.

Measure the suction tubing on outside of solution tank to ensure it will be 2-3" from the bottom of the tank. Do not allow weight to sit at the bottom of the tank.

Immerse in Solution Tank.





Plugging In

Check voltage of the outlet vs. voltage requirement of metering pump with a voltage meter.

Turn pump on and set feed rate dial to desired GPD. Refer to the output chart of your specific model number.

Plug into a grounded power source.

Spill Recovery

Detach cover. Punch out one of the indented holes with a 7/32" punch.

Insert a length of 1/4" suction/discharge tubing into the newly created hole and place the other end back into the solution tank.

Chemicals will drain back into solution tank reducing spillage.

Correct Mounting Position

STEP 1

Mount Chemical Metering Pump and Verify Voltage Supply

1.1 Locate a suitable location within ten feet of the point of injection. Preferably one to two feet above highest level of chemical solution tank.

NOTICE: **Suction Lift** installation recommended. **AVOID Flooded Suction** or pump mounted lower than the solution container. If pump is installed with Flooded Suction, a shut-off valve or other means to halt flow to pump during service must be provided.

1.2 Using the wall-mounting bracket provided, mark the location of the screw pilot holes by using the bracket as a template. Drill pilot holes as required.

NOTICE: Allow eight inches of clear space above or behind the mounting bracket for pump insertion or removal. This allows pump to be inverted in the bracket for pump tube replacement.

1.3 Secure the wall-mounting bracket to the chosen location with a suitable fastener/anchor combination.

STEP 1...CONTINUED

1.4 Slide the feeder into the bracket from the top.

1.5 Use a volt meter to verify supply voltage of the receptacle prior to connecting the power cord. Cycle the pump control (flow switch, pressure switch, etc.) to verify the metering pump power supply circuit works in conjunction with the control equipment.

1.6 Plug the metering pump into the proper receptacle.

1.7 Turn the Feed Rate Control dial to setting "10." Cycle motor On-Off switch to **ON**. Observe the rollers turn continuously.

1.8 Turn switch to **OFF** position. Proceed to Step 2.

STEP 2

Install Suction Line

2.1 Locate the 20' roll of suction/discharge tubing and uncoil. Determine the required amount of suction tubing required to reach two to three inches from the bottom of chemical tank. Use the outside of the tank as a guide. Mark this length on tubing.

2.2 Using a sharp utility knife, cut the tubing square and burr free.

2.3 Slide the connecting nut over the tubing, followed by the ferrule. Slide up the tube 1/2" to 3/4", making sure the tapered or angled portion of the ferrule and the female thread end of the nut is pointed towards the cut end of tubing.

2.4 Insert the tubing approximately 3/4" into pump tube discharge fitting labeled "IN" on tube housing cover. **FINGER TIGHT ONLY** while holding the "IN" fitting to prevent rotation.

2.5 Drill a 17/64" hole into the bung cap, lid bottle cap, etc., of the chemical tank. Push the suction tubing into the tank.

2.6 Insert the tubing into the ceramic weight assembly keeping the tubing approximately one inch from the end of the ceramic weight. Suspend the ceramic weight two or three inches above the bottom of tank. Proceed to Step 3.

NOTICE: **DO NOT** install suction/discharge without sufficient slack. Normal maintenance requires trimming. Tight radius can lead to kinks and stress cracks.

STEP 3

Install Discharge Line

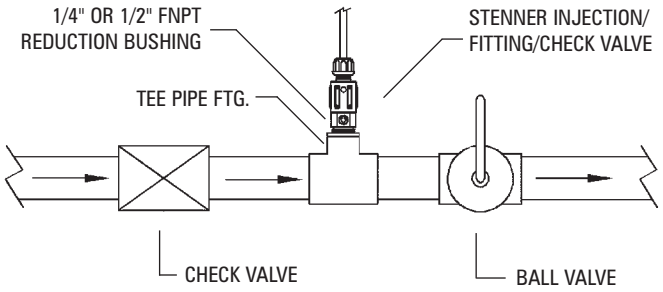
3.1 Locate remaining suction/discharge tubing, two connecting nuts and ferrules.

3.2 Repeat step 2.3. Install connecting nut and ferrule 1/2" to 3/4" up the tubing.

3.3 Insert the tubing approximately 3/4" into pump tube discharge fitting labeled "OUT" on tube housing cover. **FINGER TIGHT ONLY** while holding the "OUT" fitting to prevent rotation.

⚠ WARNING **HAZARDOUS PRESSURE:** Use caution and bleed off all resident system pressure prior to attempting service or installation.

3.4 Shut off water or circulation system and bleed off any resident system pressure.



Typical Point of Injection

3.5 Locate suitable point of injection. Install beyond all pumps and filters or as determined by application. If there is no 1/2" or 1/4" NPT female fitting at the location, one will have to be provided (refer to Steps 3.6 or 3.7).

3.6 Drill and tap the pipe wall 1/2" or 1/4" FNPT.

3.61 Drill the proper tap-size hole directly into the pipe wall (if a hole exists from previous install, be sure it is cleared of any build up). Use caution when drilling so as not to drill completely through pipe.

3.62 Using a corresponding size pipe tap, run the tap into hole 3 to 4 full threads of the tap. **DO NOT** tap too deep.

NOTICE: Verify thread fit with the MNPT end of the injection fitting.

STEP 3...CONTINUED

3.7 Install a suitable pipe tee fitting or reduction tee. Use the proper procedures for solvent welding PVC fittings as provided by the glue manufacturer. Allow ample drying time as recommended by the manufacturer's instructions for the product being used.

3.8 Locate the injection fitting or injection check valve. Wrap the MNPT end of the fitting with 2 to 3 wraps of thread seal tape. Trim extension tip as required to put tip directly in the flow of water.

3.9 Install the MNPT end of the fitting into the FNPT point of injection and hand tighten.

3.10 **High-pressure install (26-100 psi models)**
Turn on the water system and allow the system to reach operating pressure. Check the installed check valve for leaks at the NPT threads and tighten an additional one-fourth to one turn if required. Install the remaining connecting nut and ferrule onto the discharge tubing. Insert the tubing into the injection check valve until tubing bottoms in the fitting. Tighten the connecting nut.

Low-pressure install (0-25 psi models)
Install the remaining connecting nut and ferrule onto the discharge tubing. Insert the discharge tubing into the injection fitting 3/4" to 1". Tighten the connecting nut.

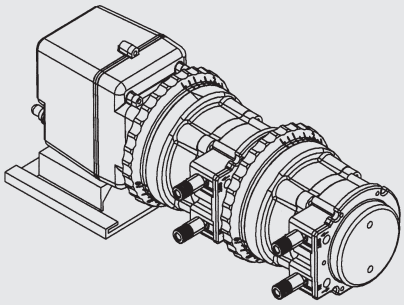
STEP 3...CONTINUED

3.11 Turn the metering pump ON.

3.12 Allow the metering pump to run on setting "10" to prime system. Visually observe the chemical move through the tubing (when tubing is clear).

3.13 Turn the Feed Rate Control dial to your required initial setting. Check the entire system for leaks.

3.14 After a suitable amount of time dosing, verify your application with test equipment. Perform final adjustments to the metering pump setting to provide the required residual or results as determined through adequate test equipment or analysis.



Determining Dual Head Dual Control Output

On double-head systems, dual-control mechanisms are available to match your application needs. In this type of configuration, the outside head is set to operate at a percentage of the inside head. To determine output rates on a dual head dual control pump:

1. **Use the appropriate output table to select the desired output for the inside pump head, or Primary Output.**

2. **Using as an example: 170MDC5**

- **Primary feed rate control on 4 = 34 GPD (103 LPD)**
- **Outside feed rate control on 3 = 30% of primary feed rate setting OR 10.2 GPD (30.9 LPD)**

NOTICE: The outside feed rate control is completely dependent on the primary feed rate control. To achieve maximum output, both settings have to be on 10.

PUMP TUBE REPLACEMENT INSTRUCTIONS

SAFETY HAZARDS AND NOTICES

⚠ 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, pump generous amounts of water or a compatible buffer solution to remove chemical from pump prior to service.
- Consult chemical manufacturer and MSDS 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.

⚠ 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 tubing from pump. Discharge may be under pressure. Tubing may contain chemical.

⚠ CAUTION PINCH POINT HAZARD:

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

ADDITIONAL PRECAUTIONS AND NOTICES

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

NOTICE: Inspect the suction/discharge tubing, injection point (into pipe), and injection check valve duckbill for blockages after any tube rupture. Clear as required.

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

NOTICE: Rinse off chemical residual and clean all chemical and debris from pump head components prior to tube replacement. Apply Stenner grease to main shaft and tube housing cover bushing during tube replacement.

Prepare Pump For Tube Replacement

1. Read and understand all safety instructions and precautions prior to attempting tube replacement.
2. Pump a generous amount of water or compatible buffer to flush chemical from pump tube and lines. Allow pump to run dry several minutes.
3. Disconnect pump suction and discharge tubing connections from pump head. Use caution and follow all safety instructions.
4. Relocate pump to a suitable bench or location to perform service.
5. Plug power cord into a constantly energized, properly grounded receptacle for service.

Removing the Old Pump Tube

1. Turn metering pump “off.”
2. Unscrew and remove the tube housing cover.
3. Set the Feed Rate dial to L setting and leave on this setting until finished.
4. Turn the pump “on” and let it run until one of the three slots in the roller assembly lines up with the bottom tube fitting (suction side).
5. Turn pump “off.”
6. Without moving the roller assembly further, lift the tube fitting out of the housing slot and pull it toward the center of the roller.
7. Turn the pump “on” and allow roller assembly to jog while guiding the tube up and out of the housing. Turn the pump “off” when the slot in the roller assembly aligns with the “OUT” (discharge) tube fitting. Completely remove the tube assembly.

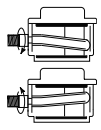
Installing the New Pump Tube

1. With the pump still on L setting, run until one of the three slots in the roller assembly lines up with the bottom tube fitting (suction side). Turn pump “off.”
2. Place the tube fitting into position in the housing and slot.
3. Turn the pump “on” and allow the pump to jog the roller assembly while guiding the tube to prevent it from getting pinched between housing and roller assembly.
4. When the roller assembly slot reaches the housing slot the fitting inserts into, turn pump “off.” Turn Feed Rate dial to “10.” While holding fitting away from roller assembly, turn pump “on” and allow rollers to stretch tube until fitting can be inserted into the housing.
5. Turn the pump “off.”
6. Replace the cover and the screws leaving the front screws over the fitting loose enough to rotate the tube fitting.

Centering the Pump Tube

To obtain maximum tube life, the tube must ride in the center of the rollers.

1. To center the tube on the rollers, set the Feed Rate dial to setting “10.” Turn pump “on.”
2. Turn the “IN” (suction) tube fitting located on the bottom of the pump head not more than 1/8 of a turn in the direction in which the tube must move.
3. Observe the tube assembly respond and adjust in either direction until the tube rides approximately in the center of the rollers.
4. Turn the pump “off.” Tighten the cover screws.



NOTICE: Avoid rotating your wrist while installing tube. This will prevent tube twisting. A twisted tube will not center. BE CAREFUL OF YOUR FINGERS. Do not force the tube.

SEPARATING AND RECONNECTING COMPONENTS

Stenner's quick-lock riveting system makes component separation and reconnection fast and easy.

Separating

1. Turn the pump off and unplug the power cord.
2. Hold the feed rate control section and turn pump head clockwise until it stops.
3. Pull the pump head straight out.
4. Grasp the feed rate control section and turn clockwise until it stops and pull straight out.

For Double Head and Dual Head Control pumps, follow the above steps, starting with the outside pump head first and working toward the motor.

Reconnecting

1. To reconnect the feed rate control to the motor, confirm pressure spring is in place, line up the flat side of the motor shaft with the flat side of the brass spider in the feed rate control, and push straight on.
2. Turn the feed rate control so the rivet holes line up with the rivets and turn counter clockwise until it locks into place. The arrow on the feed rate should be on top.
3. Put the pump head (with shaft) into the feed rate control and turn it counter clockwise until the shaft falls into place and locks.
4. Line up the rivet holes on the pump head with the rivets on the feed rate control while pushing and turning it until the snap lock engages firmly to the pump head by turning it counterclockwise.
5. Attach the pump head firmly by turning it counterclockwise.

CLEANING THE POINT OF INJECTION

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

NOTICE: Low-pressure models are installed using an injection fitting and high-pressure models use an injection check valve. Both allow the extension tip to be installed in the center of the pipe directly in the flow of water to help reduce deposit accumulation.

⚠ 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 tubing from pump. Discharge may be under pressure. Tubing 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.

1. Turn metering pump "off" and unplug power cord. Disable water pump or auxiliary equipment electrical supply.
2. Depressurize system and bleed pressure from pump discharge tubing.
3. Loosen and remove connecting nut and ferule from the injection check valve or injection fitting to disconnect discharge tubing.

For high-pressure models (100 psi)

- Unscrew the top fitting (check valve body) to disassemble. The bottom fitting (injection fitting with arrow) should remain attached to the pipe.
- Remove duckbill from check valve body and replace if deteriorated or swollen (yearly replacement recommended). If clogged, clean or replace.
- Examine O-Ring on the injection fitting and replace if deteriorated or damaged.

4. Insert a round shank 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 tubing if cracked or deteriorated. If the end is clogged, cut off the calcified or blocked section of tubing.
6. **For low-pressure models (25 psi)**

- Replace ferrule and insert the discharge tubing into the injection fitting approximately 3/4"-1" until it stops.

For high-pressure models (100 psi)

- Reassemble the injection check valve in reverse order.
- Replace ferrule and insert the discharge tubing into the injection check valve approximately 3/4" until it stops.

7. Tighten the connecting nut finger tight.
8. Enable the water pump electrical supply and pressurize the water system.
9. Put the metering pump back in service and inspect all connections for leaks.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	SOLUTION
Gear Motor	⚠ **WARNING** **HAZARDOUS VOLTAGE:** **DISCONNECT** power cord before removing motor cover for service. **Electrical service by trained personnel only.**	
Noise is excessively loud.	Ball bearings are worn.	Replace ball bearing assembly.
	Lubrication is insufficient.	Grease gears and gear posts.
	Gears or gear posts are worn.	Inspect/replace gears and gear posts.
Motor does not work; fan is not running.	Electrical supply is faulty.	Check supply voltage circuit.
	Motor coil is damaged.	Replace motor coil.
	Motor bearings are worn or damaged.	Replace ball bearing assembly.
	Power cord is damaged.	Inspect/replace power cord.
	Wire connections are faulty.	Inspect/repair electrical connections.
Motor runs; fan turns; output shaft does not.	Gear has failed.	Replace failed gear.
	Output gear is stripped.	Replace output shaft.
Motor overheats and shuts off and on.	Voltage is incorrect.	Check that voltage and frequency match data label.
	Ambient temperature is high.	Install pump in an area not to exceed a maximum of 125˚ F.
	Coil is damaged/malfunctioning.	Replace motor coil.
Feed Rate Control		
Adjustment ring will not turn.	Variable cam has seized.	Grease variable cam and cam slot.
	Adjustment ring has seized.	Clean and lubricate ring.
Adjustment ring turns, output doesn't change.	Variable cam has disengaged from ring.	Re-insert bend into ring.
	Variable cam is broken.	Replace variable cam.
Pump head is not rotating.	Index plate is worn.	Turn over or replace index plate.
	Problem with the gear motor.	Refer to Gear Motor Section.
	Pump head roller assembly is stripped.	Replace roller assembly.
	Index pin is broken.	Replace index pin and lifter assembly.
Pump head rotates continuously.	Variable cam is installed incorrectly.	Replace or re-insert variable cam.
Indexing is erratic.	Index plate is worn.	Turn over or replace index plate.
	Variable cam is worn.	Replace variable cam.
	Lifter is worn.	Replace index pin and lifter assembly.
Pump Tubes	**NOTICE:** A leaking pump tube damages the metering pump. Inspect pump frequently for leakage and wear. Refer to pump tube replacement section for additional safety precautions and instructions.	
Tube is leaking.	Pump tube has ruptured.	Replace pump tube at routine intervals.
	Calcium or mineral deposit.	Clean injection fitting, replace pump tube.
	Excessive back pressure.	Check tube psi rating against system pressure; replace accordingly.
	Tube is not centered.	Replace tube and center it.
Tube life is shortened.	Chemical attack.	Check chemical compatibility.
	Mineral deposit at injection point.	Remove deposit and replace pump tube.
	Sediment blockage.	Maintain suction line 2 – 3" above bottom of tank. Use a suction line strainer.
	Degraded check valve duckbill.	Replace check valve duckbill at every tube change.
Pump Heads		
Components are cracking.	Chemical attack.	Check chemical compatibility.
Visible fluid in pump head.	Pump tube rupture/leak.	Replace pump tube and ferrules and center.
No pump output; pump head rotates.	Depleted solution tank.	Replenish solution.
	Pump suction line weight is above solution.	Maintain suction line 2 – 3" off bottom of tank.
	Suction line leak.	Inspect or replace suction line.
	Ferrules installed incorrectly or damaged.	Replace compression ferrules.
	Injection point is clogged.	Inspect and clean injection point.
	Clogged suction/discharge tubing and/or injection check valve.	Clean and/or replace as necessary.
	Life of pump tube is exhausted.	Replace pump tube.
Low pump output; pump head rotates.	Pump tube is worn.	Replace pump tube.
	Injection point is restricted.	Inspect and clean injection point.
	High system back pressure.	Check tube against system pressure; replace accordingly.
No pump output; pump head not rotating.	Roller assembly is stripped.	Replace roller assembly.
	Feed Rate Control problem.	Refer to Feed Rate Control section.
	Gear motor problem.	Refer to Gear Motor section.
Pump output is high.	Incorrect tube size.	Replace tube with correct size.
	Roller assembly is broken.	Replace roller assembly.
	Malfunctioning Feed Rate Control.	Refer to Feed Rate Control section.
	Incorrect model of motor.	Replace with proper gear motor.

ROTOR AND CAM ASSEMBLY REPLACEMENT INSTRUCTIONS

Rotor Assembly

CAM Assembly

ROTOR ASSEMBLY REPLACEMENT INSTRUCTIONS

⚠ WARNING HAZARDOUS VOLTAGE:
DISCONNECT power cord before removing motor cover for service. **Electrical service by trained personnel only.**

1. Remove the two motor cover screws with Phillips screwdriver. Remove motor cover to expose motor fan, rotor, and coil assembly.
2. Pry off plastic fan with flat head screwdriver.
3. With Phillips screwdriver, remove the two coil screws and lock washers (set aside), then remove and discard the first plastic bearing bracket.
4. Take the coil out of the motor housing and set aside.
5. Remove the rotor assembly and second plastic bearing bracket and discard both.
6. Snap new plastic bearing bracket with tolerance ring into place.
7. Install new rotor assembly. Be sure the helical gear end of the shaft is inserted into the gear case.
8. Reinstall the coil over the rotor. When viewing from the fan end of the rotor shaft, the copper shaded pole on the coil is to the right.
9. Place the second plastic bearing bracket with tolerance ring through the rotor shaft and snap into place.
10. Reinstall the two coil screws and lock washers. Be sure to turn the self-tapping screws backwards, until they fall into the original threads of the motor housing to avoid stripping.
11. Tighten the coil screws down and press the fan (hub side down) back onto the rotor shaft.
12. Reassemble motor cover. Turn screws counterclockwise to engage threads. Once engaged in threads, tighten screws clockwise.

CAM REPLACEMENT INSTRUCTIONS

1. Grasp the feed rate control, turn clockwise, and pull away to detach from the motor.
2. Remove the three mounting plate screws and the mounting plate.
3. Remove the feed rate dial and observe how the old cam is installed before removing it.
4. Remove old cam from guide slot.
5. Before installing the new cam, lubricate the angled tip with grease from the feed rate control.
6. Feed the angled tip into the slot while making sure that the 90-degree bent end is pointing in the correct direction (see above illustration). To keep the cam from rising up while inserting, place finger as a guide over the cam guide slot. Feed entire cam in until the angled tip is approximately 1/2" from contacting cam. Place the spider on the index plate so the lifter is in the 1/2" cam gap and the pin tip is in a hole in the index plate.
7. Insert the 90-degree bent end of the cam into the dial ring boss (hole) and fit the dial ring on the feed rate housing.
8. Put the mounting plate back on the feed rate, aligning the arrows located on the mounting plate and feed rate housing.
9. When replacing the mounting plate screws, start by turning the screws counterclockwise to engage the existing threads. Once properly engaged in threads, turn the screws clockwise.
10. Grasp the dial ring in one hand and the feed rate housing with the other hand with the arrow facing up. Turn the dial ring from L to 10 and back again. Dial ring should move easily without binding.

OUTPUT SPECIFICATIONS

Series 45 M – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
45M1	#1	0.2	0.6	0.3	0.9	0.6	1.8	0.9	2.7	1.2	3.6	1.5	4.5	1.8	5.5	2.1	6.4	2.4	7.3	2.7	8.2	3.0	9.1
45M2	#2	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.2	9.0	27.3	10.0	30.3
45M3	#3	1.1	3.3	2.2	6.6	4.4	13.3	6.6	20.0	8.8	26.6	11.0	33.3	13.2	40.0	15.4	46.6	17.6	53.3	19.8	60.0	22.0	66.6
45M4	#4	1.7	5.1	3.5	10.6	7.0	21.2	10.5	31.8	14.0	42.4	17.5	53.0	21.0	63.6	24.5	74.2	28.0	84.8	31.5	95.4	35.0	106.0
45M5	#5	2.5	7.6	5.0	15.1	10.0	30.3	15.0	45.4	20.0	60.6	25.0	75.7	30.0	90.8	35.0	106.0	40.0	121.1	45.0	136.3	50.0	151.4

Series 45 MHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
45MHP2	#1	0.2	0.6	0.3	0.9	0.6	1.8	0.9	2.7	1.2	3.6	1.5	4.5	1.8	5.5	2.1	6.4	2.4	7.3	2.7	8.2	3.0	9.1
45MHP10	#2	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.2	9.0	7.3	10.0	30.3
45MHP22	#7	1.1	3.3	2.2	6.6	4.4	13.3	6.6	20.0	8.8	26.6	11.0	33.3	13.2	40.0	15.4	46.6	17.6	53.3	19.8	60.0	22.0	66.6

Series 85 M – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
85M1	#1	0.3	0.9	0.5	1.5	1.0	3.0	1.5	4.5	2.0	6.1	2.5	7.6	3.0	9.1	3.5	10.6	4.0	12.1	4.5	13.6	5.0	15.1
85M2	#2	0.8	2.4	1.7	5.1	3.4	10.3	5.1	15.4	6.8	20.6	8.5	25.7	10.2	30.9	11.9	36.0	13.6	41.2	15.3	46.3	17.0	51.5
85M3	#3	2.0	6.1	4.0	12.1	8.0	24.2	12.0	36.3	16.0	48.5	20.0	60.6	24.0	76.7	28.0	84.8	32.0	96.9	36.0	109.0	40.0	121.1
85M4	#4	3.0	9.1	6.0	18.2	12.0	36.3	18.0	54.5	24.0	76.7	30.0	90.8	36.0	109.0	42.0	127.2	48.0	145.3	54.0	163.5	60.0	181.7
85M5	#5	4.3	13.0	8.5	25.7	17.0	51.5	25.5	77.2	34.0	103.0	42.5	128.7	51.0	154.4	59.5	180.0	68.0	205.9	76.5	231.6	85.0	257.4

Series 85 MHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
85MHP5	#1	0.3	0.9	0.5	1.5	1.0	3.0	1.5	4.5	2.0	6.1	2.5	7.6	3.0	9.1	3.5	10.6	4.0	12.1	4.5	13.6	5.0	15.1
85MHP17	#2	0.8	2.4	1.7	5.1	3.4	10.3	5.1	15.4	6.8	20.6	8.5	25.7	10.2	30.9	11.9	36.0	13.6	41.2	15.3	46.3	17.0	51.5
85MHP40	#7	2.0	6.1	4.0	12.1	8.0	24.2	12.0	36.3	16.0	48.5	20.0	60.6	24.0	76.7	28.0	84.8	32.0	96.9	36.0	109.0	40.0	121.1

Series 100 DM – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
100DM1	#1	0.3	0.9	0.6	1.8	1.2	3.6	1.8	5.5	2.4	7.3	3.0	9.1	3.6	10.9	4.2	12.7	4.8	14.5	5.4	16.4	6.0	18.2
100DM2	#2	1.0	3.0	2.0	6.1	4.0	12.1	6.0	18.2	8.0	24.2	10.0	30.3	12.0	36.4	14.0	42.4	16.0	48.5	18.0	54.5	20.0	60.6
100DM3	#3	2.2	6.7	4.4	13.3	8.8	26.7	13.2	40.0	17.6	53.3	22.0	66.6	26.4	79.9	30.8	93.3	35.2	106.6	39.6	119.9	44.0	133.2
100DM4	#4	3.5	10.6	7.0	21.2	14.0	42.4	21.0	63.6	28.0	84.8	35.0	106.0	42.0	127.2	49.0	148.4	56.0	169.6	63.0	190.8	70.0	212.0
100DM5	#5	5.0	15.1	10.0	30.3	20.0	60.6	30.0	90.8	40.0	121.1	50.0	151.4	60.0	181.7	70.0	212.0	80.0	242.2	90.0	272.5	100.0	302.8

Series 100 DMHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING:Outputs per day in U.S. Gallons (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
100DMHP5	#1	0.3	0.9	0.6	1.8	1.2	3.6	1.8	5.5	2.4	7.3	3.0	9.1	3.6	10.9	4.2	12.7	4.8	14.5	5.4	16.4	6.0	18.2
100DMHP20	#2	1.0	3.0	2.0	6.1	4.0	12.1	6.0	18.2	8.0	24.2	10.0	30.3	12.0	36.4	14.0	42.4	16.0	48.5	18.0	54.5	20.0	60.6

OUTPUT SPECIFICATIONS

Series 100 MDC – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right) for primary feed rate only

		L		1		2		3		4		5		6		7		8		9		10	
100MDC1	#1	0.2	0.6	0.3	0.9	0.6	1.8	0.9	2.7	1.2	3.6	1.5	4.5	1.8	5.5	2.1	6.4	2.4	7.3	2.7	8.2	3.0	9.1
100MDC2	#2	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.2	9.0	27.3	10.0	30.3
100MDC3	#3	1.1	3.3	2.2	6.6	4.4	13.3	6.6	20.0	8.8	26.6	11.0	33.3	13.2	40.0	15.4	46.6	17.6	53.3	19.8	60.0	22.0	66.6
100MDC4	#4	1.7	5.1	3.5	10.6	7.0	21.2	10.5	31.8	14.0	42.4	17.5	53.0	21.0	63.6	24.5	74.2	28.0	84.8	31.5	95.4	5.0	106.0
100MDC5	#5	2.5	7.6	5.0	15.1	10.0	30.3	15.0	45.4	20.0	60.6	25.0	75.7	30.0	90.9	35.0	106.0	40.0	121.1	45.0	136.3	50.0	151.4

Series 100 MDCHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right) for primary feed rate only

		L		1		2		3		4		5		6		7		8		9		10	
100MDCHP5	#1	0.2	0.6	0.3	0.9	0.6	1.8	0.9	2.7	1.2	3.6	1.5	4.5	1.8	5.5	2.1	6.4	2.4	7.3	2.7	8.2	3.0	9.1
100MDCHP20	#2	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.3	9.0	27.3	10.0	30.3

Series 170 DM – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60 Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
170DM1	#1	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.2	9.0	27.3	10.0	30.3
170DM2	#2	1.7	5.1	3.4	10.3	6.0	18.2	9.5	28.8	13.6	39.1	17.0	51.5	20.4	61.8	23.8	72.1	27.2	82.4	30.6	92.7	34.0	102.6
170DM3	#3	4.0	12.1	8.0	24.2	16.0	48.5	24.0	72.7	32.0	96.9	40.0	121.1	48.0	145.4	56.0	169.6	64.0	193.8	72.0	218.0	80.0	242.2
170DM4	#4	6.0	18.2	12.0	36.3	24.0	72.7	36.0	109.0	48.0	145.3	60.0	181.7	72.0	218.0	84.0	254.4	96.0	290.7	108.0	327.0	120.0	363.4
170DM5	#5	8.5	25.7	17.0	51.5	34.0	86.0	51.0	154.4	68.0	205.9	85.0	257.4	102.0	308.9	119.0	360.4	136.0	411.8	153.0	463.3	170.0	514.8

Series 170 DMHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60 Hz (left) & Liters @ 50Hz (right)

		L		1		2		3		4		5		6		7		8		9		10	
170DMHP9	#1	0.5	1.5	1.0	3.0	2.0	6.1	3.0	9.1	4.0	12.1	5.0	15.1	6.0	18.2	7.0	21.2	8.0	24.2	9.0	27.3	10.0	30.3
170DMHP34	#2	1.7	5.1	3.4	10.3	6.0	18.2	9.5	28.8	12.9	39.1	17.0	51.5	20.4	61.8	23.8	72.1	27.2	82.4	30.6	92.7	34.0	102.6

Series 170 MDC – Adjustable Low Pressure: 0 to 25 psi (1.72 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right) for primary feed rate only

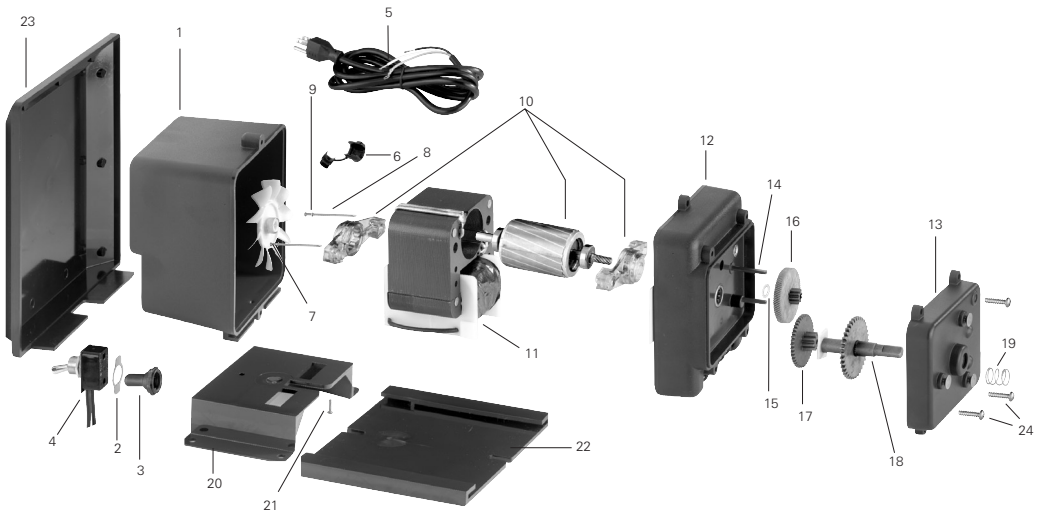
		L		1		2		3		4		5		6		7		8		9		10	
170MDC1	#1	0.3	0.9	0.5	1.5	1.0	3.0	1.5	4.5	2.0	6.1	2.5	7.6	3.0	9.1	3.5	10.6	4.0	12.1	4.5	13.6	5.0	15.1
170MDC2	#2	0.8	2.4	1.7	5.1	3.4	10.3	5.1	15.4	6.8	20.6	8.5	25.7	10.2	30.9	11.9	36.0	13.6	41.2	15.3	46.3	17.0	51.5
170MDC3	#3	2.0	6.1	4.0	12.1	8.0	24.2	12.0	36.3	16.0	48.5	20.0	60.6	24.0	76.7	28.0	84.8	32.0	96.9	36.0	109.0	40.0	121.1
170MDC4	#4	3.0	9.1	6.0	18.2	12.0	36.3	18.0	54.5	24.0	76.7	30.0	90.8	36.0	109.0	42.0	127.2	48.0	145.3	54.0	163.5	60.0	181.7
170MDC5	#5	4.3	13.0	8.5	25.7	17.0	51.5	25.5	77.2	34.0	103.0	42.5	128.7	51.0	154.4	59.5	180.0	68.0	205.9	76.5	231.6	85.0	257.4

Series 170 MDCHP – Adjustable High Pressure: 0 to 100 psi (6.9 bar) Maximum Discharge Pressure

MODEL TUBE FEED RATE CONTROL SETTING: Outputs per day in U.S. Gallons @ 60Hz (left) & Liters @ 50Hz (right) for primary feed rate only

		L		1		2		3		4		5		6		7		8		9		10	
170MDCHP9	#1	0.3	0.9	0.5	1.5	1.0	3.0	1.5	4.5	2.0	6.1	2.5	7.6	3.0	9.1	3.5	10.6	4.0	12.1	4.5	13.6	5.0	15.1
170MDCHP34	#2	0.8	2.4	1.7	5.1	3.4	10.3	5.1	15.4	6.8	20.6	8.5	25.7	10.2	30.9	11.9	36.0	13.6	41.2	15.3	46.3	17.0	51.5

MOTOR ASSEMBLIES AND PARTS



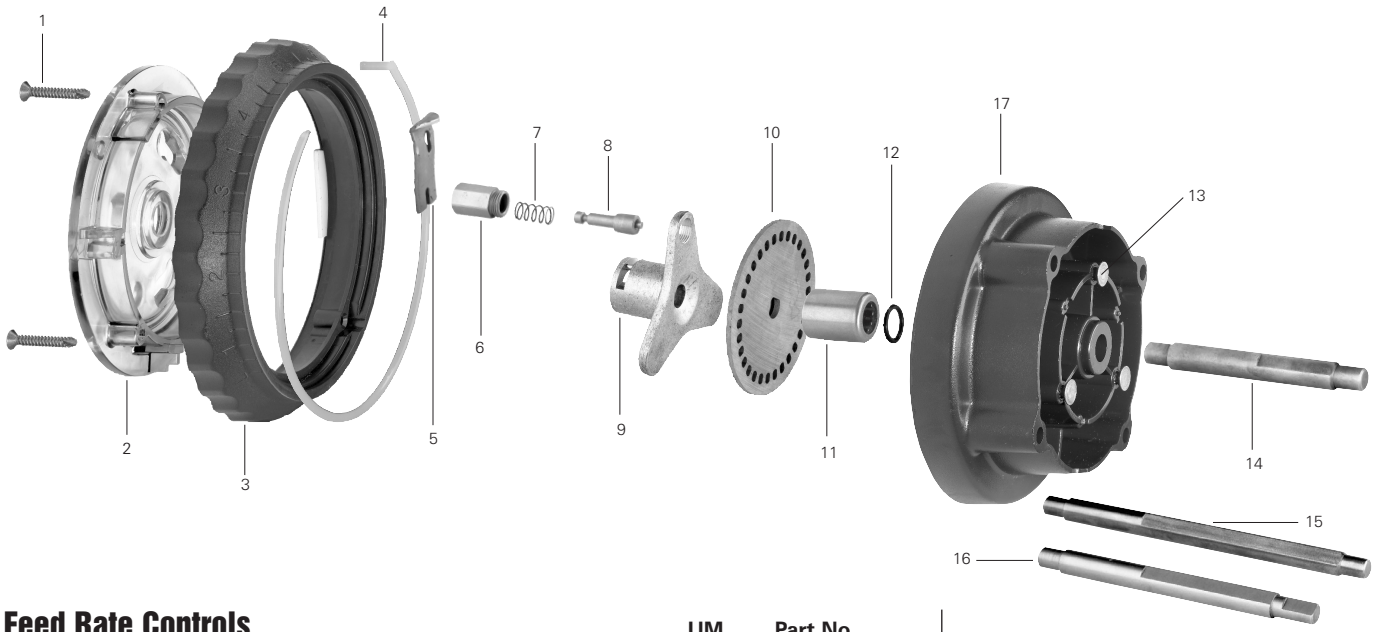
Gear Motor Assemblies for Adjustable Rate Models	UM	Part No.
Series 45 & 100 – Complete Gear Motor 120VAC 60Hz	EA	PM6041D
Series 45 & 100 – Complete Gear Motor 220VAC 60Hz	EA	PM6042D
Series 45 & 100 – Complete Gear Motor 230VAC 50Hz	EA	PM64230
Series 45 & 100 – Complete Gear Motor 250VAC 50Hz	EA	PM6426D
Series 85 & 170 – Complete Gear Motor 120VAC 60Hz	EA	PM6081D
Series 85 & 170 – Complete Gear Motor 220VAC 60Hz	EA	PM6082D
Series 85 & 170 – Complete Gear Motor 230VAC 50Hz	EA	PM68230
Series 85 & 170 – Complete Gear Motor 250VAC 50Hz	EA	PM6826D

Gear Motor Assemblies for Single Head-Fixed Rate Models	UM	Part No.
Series 45MP – Complete Gear Motor 120VAC 60Hz	EA	ME6041D
Series 45MP – Complete Gear Motor 220VAC 60Hz	EA	ME6042D
Series 45MP – Complete Gear Motor 230VAC 50Hz	EA	ME64230
Series 45MP – Complete Gear Motor 250VAC 50Hz	EA	ME6426D
Series 85MP – Complete Gear Motor 120VAC 60Hz	EA	ME6081D
Series 85MP – Complete Gear Motor 220VAC 60Hz	EA	ME6082D
Series 85MP – Complete Gear Motor 230VAC 50Hz	EA	ME68230
Series 85MP – Complete Gear Motor 250VAC 50Hz	EA	ME6826D

Gear Motor Assemblies for Double Head-Fixed Rate Models	UM	Part No.
Series 100DMP – Complete Gear Motor 120VAC 60Hz	EA	DM6041D
Series 100DMP – Complete Gear Motor 220VAC 60Hz	EA	DM6042D
Series 100DMP – Complete Gear Motor 230VAC 50Hz	EA	DM64230
Series 100DMP – Complete Gear Motor 250VAC 50Hz	EA	DM64250
Series 170DMP – Complete Gear Motor 120VAC 60Hz	EA	DM6081D
Series 170DMP – Complete Gear Motor 220VAC 60Hz	EA	DM6082D
Series 170DMP – Complete Gear Motor 230VAC 50Hz	EA	DM68230
Series 170DMP – Complete Gear Motor 250VAC 50Hz	EA	DM68250

Gear Motor Parts	UM	Part No.
1- Motor Cover with Cord (120VAC)	EA	PM6A0BL
Motor Cover with Cord (220VAC)	EA	PM6A0OL
2- On-Off Switch Plate	EA	MP6D000
3- Switch Boot	EA	MP6C000

Gear Motor Parts…Continued	UM	Part No.
4- Toggle Switch	EA	PM6E000
Wire Connector *not shown*	EA	PM6E001
5- Power Cord 120VAC	EA	MP6B010
Power Cord 220VAC	EA	MP6B020
6- Strain Relief Bushing	EA	MP6V000
7- Motor Fan	EA	PM6F000
8&9- Coil Screw "G" w/Lock Washer	EA	PMS00G1
10- Rotor Assembly with Bearings, Brackets and Tolerance Rings	EA	PMBRPL2
11- Coil 120VAC 60Hz	EA	MP6J115
Coil 220VAC 60Hz	EA	MP6J226
Coil 230VAC 50Hz *International*	EA	MP6J223
Coil 250VAC 50Hz *International*	EA	MP6J222
12- Gear Case	EA	PM6K0BL
Motor Shaft Cup Bearing *not shown*	EA	PM6K001
13- Gear Case Cover	EA	PM6R0BL
14- Gear Posts	EA	PM6M000
15- Thrust Washer	EA	MP6P000
16- Phenolic Gear w/Gear Spacer (26 RPM - Series 45 & 100)	EA	MP6N040
Phenolic Gear w/Gear Spacer (44 RPM - Series 85 & 170)	EA	MP6N080
Phenolic Gear Spacer *not shown*	EA	PM6M001
17- Metal Reduction Gear (26 RPM - Series 45 & 100)	EA	MP6O040
Metal Reduction Gear (44 RPM - Series 85 & 170)	EA	MP6O080
18- Motor Shaft w/Gear (Adjustable Rate Models)	EA	MP6Q00D
Motor Shaft w/Gear (Single Head - Fixed Rate Models)	EA	ME6Q0LD
Motor Shaft w/Gear (Double Head - Fixed Rate Models)	EA	DM6Q0LD
19- Pressure Spring	EA	MP6T000
20- Motor Base	EA	MP70000
21- Motor Base Screw "D"	EA	PMS000D
22- Mounting Bracket	EA	MP80000
23- Rain Roof	EA	MP90000
24- Cover Screw "B" (Package of 10)	PK	UCCPS0B
Cover Screw "B" (Package of 24)	PK	MCCPS0B
Coil Ground Screw "E" *not shown*	EA	PMS000E



Feed Rate Controls

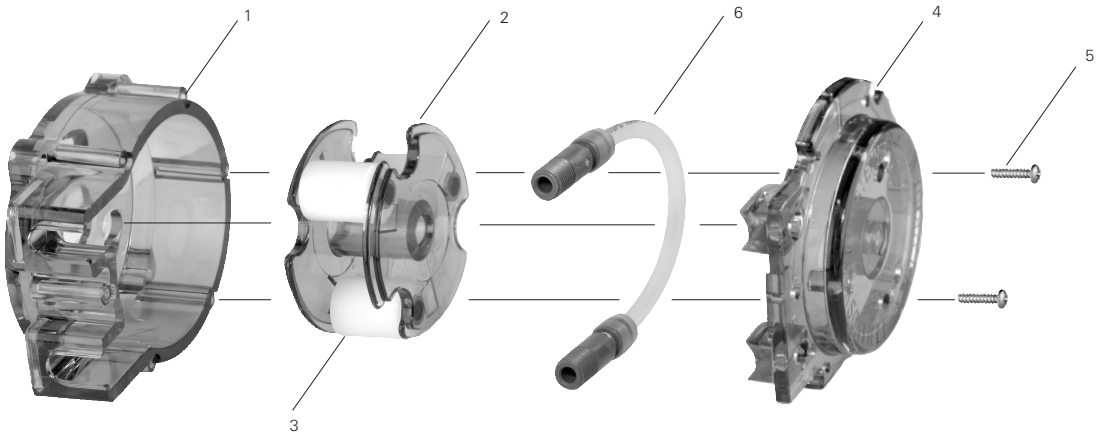
	UM	Part No.
Single Head Feed Rate Control w/Shaft	EA	FC5040D
Double Head Feed Rate Control w/Shaft	EA	DM5040D
Dual Head Dual Control Feed Rate Control w/Shaft	EA	DM504DC

Feed Rate Parts

	UM	Part No.
1- FRC Screw "A"	EA	FCS000A
2- Feed Rate Mounting Plate	EA	FC5N000
3- Dial Ring	EA	FC5M040
4- Variable Cam (Package of 2)	PK	UCFC5H0
Variable Cam (Package of 5)	PK	MCFC5H0
Index Pin Assembly with Lifter (Package of 1) *not shown*	PK	UCFC5AY
Index Pin Assembly with Lifter (Package of 2) *not shown*	PK	MCFC5AY
5- Index Pin Lifter (Package of 2)	PK	UCFC5L1
Index Pin Lifter (Package of 5)	PK	MCFC5L1
6- Index Pin Holder	EA	FC5L003
7- Index Pin Spring	EA	FC5L005
8- Index Pin	EA	FC5L002
9- Index Spider	EA	FC5K00D
10- Index Plate (Package of 1)	PK	UCFC5ID
Index Plate (Package of 5)	PK	MCFC5ID
11- Roller Clutch	EA	FC5F000
12- O-Ring Seal 3/8"	EA	FC5E000
13- Mounting Rivet "C"	EA	FCS000C
14- Main Shaft for Single Head-Adjustable Rate (Package of 1)	PK	UCFC5AD
Main Shaft for Single Head-Adjustable Rate (Package of 2)	PK	MCFC5AD
15- Main Shaft for Double Head Adjustable Rate	EA	DM5A00D
16- Main Shaft for Dual Head Dual Control – Adjustable Rate	EA	DM5A0DC
17- Feed Rate Housing w/Roller Clutch, Seal and Rivets	EA	FC5D0OS

Patented Mechanical Control

Stenner's unique control mechanism allows output to be scaled from 5% to 100% with a simple turn of the dial. Numbers on the dial are in 10% increments, and each graduation marking represents a 2.5% step.



Pump Heads (pump tube included)

		UM	Part No.
#1 Pump Head (Package of 1)		PK	UCTHC1D
#1 Pump Head (Package of 2)		PK	MCTHC1D
#1 Pump Head (Package of 1)	(ferrules 1/4" & duckbill included)	PK	UCPH1FD
#2 Pump Head (Package of 1)		PK	UCTHC2D
#2 Pump Head (Package of 2)		PK	MCTHC2D
#2 Pump Head (Package of 1)	(ferrules 1/4" & duckbill included)	PK	UCPH2FD
#3 Pump Head (Package of 1)		PK	UCTHC3D
#3 Pump Head (Package of 2)		PK	MCTHC3D
#4 Pump Head (Package of 1)		PK	UCTHC4D
#4 Pump Head (Package of 2)		PK	MCTHC4D
#5 Pump Head (Package of 1)		PK	UCTHC5D
#5 Pump Head (Package of 2)		PK	MCTHC5D
#7 Pump Head (Package of 1)	Single Head Only	PK	UCTHC7D
#7 Pump Head (Package of 2)	Single Head Only	PK	MCTHC7D
#7 Pump Head (Package of 1)	(ferrules 1/4" & duckbill included)	PK	UCPH7FD

Refer to output tables for correct tube size

Pump Head Parts

	UM	Part No.
1- Tube Housing Only (Package of 1)	PK	UCCP400
Tube Housing Only (Package of 2)	PK	MCCP400
2- Roller Assembly – (Package of 1)	PK	UC3ASYD
Roller Assembly – (Package of 4)	PK	MC3ASYD
3- Standard Roller	EA	CP33000
4- Tube Housing Cover Bushing Included (Package of 1)	PK	UCCP100
Tube Housing Cover Bushing Included (Package of 4)	PK	MCCP100
5- Cover Screw “B” (Package of 10)	PK	UCCPS0B
Cover Screw “B” (Package of 24)	PK	MCCPS0B
Adapter Tube Housing Cover (Package of 1) *not shown*	PK	UCDM1A0
Adapter Tube Housing Cover (Package of 2) *not shown*	PK	MCDM1A0
Roller Shaft Bushing *not shown*	EA	CP31RSB
Tube Housing Cover Bushing Only *not shown*	EA	CP100CB

Prime Point

Never use lubrication grease or oil on the pump tube, pump head, or roller assembly. Some types of grease and oil are incompatible with plastic parts and could cause failure.

PUMP TUBES AND ADAPTER PUMP HEADS

PUMP TUBE ASSEMBLY NOTES:

- **Stenner pump tubes (except #7) are interchangeable with all Stenner metering pumps. Pump output range can be changed by using a different pump tube.**
- **Pump tube fittings are stamped with numbers, 1-5 are rated for 0-25 psi back pressure and 1,2, & 7 are rated for 0-100 psi back pressure.**
- **Note: #7 pump tubes only fit single-head pumps for high-pressure applications.**

Pump Tubes (ferrules included)

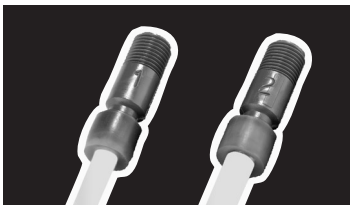
		UM	Part No.	
6- #1 Pump Tube (Package of 2)		PK	UCCP201	Refer to output tables for correct tube size
#1 Pump Tube (Package of 5)		PK	MCCP201	
#1 Pump Tube (Package of 2)	(ferrules 1/4" & duckbills included)	PK	UCCP1FD	
#2 Pump Tube (Package of 2)		PK	UCCP202	
#2 Pump Tube (Package of 5)		PK	MCCP202	
#2 Pump Tube (Package of 2)	(ferrules 1/4" & duckbills included)	PK	UCCP2FD	
#3 Pump Tube (Package of 2)		PK	UCCP203	
#3 Pump Tube (Package of 5)		PK	MCCP203	
#4 Pump Tube (Package of 2)		PK	UCCP204	
#4 Pump Tube (Package of 5)		PK	MCCP204	
#5 Pump Tube (Package of 2)		PK	UCCP205	
#5 Pump Tube (Package of 5)		PK	MCCP205	
#7 Pump Tube (Package of 2)	Single Head Only	PK	UCCP207	
#7 Pump Tube (Package of 5)	Single Head Only	PK	MCCP207	
#7 Pump Tube (Package of 2)	(ferrules 1/4" & duckbills included)	PK	UCCP7FD	
Pump Tubes – Europe (6mm ferrules included)				
#1 Pump Tube (Package of 2)		PK	UCCP21CE	Refer to output tables for correct tube size
#1 Pump Tube (Package of 5)		PK	MCCP21CE	
#1 Pump Tube (Package of 2)	(ferrules 6mm & duckbills included)	PK	UC1FDCE	
#2 Pump Tube (Package of 2)		PK	UCCP22CE	
#2 Pump Tube (Package of 5)		PK	MCCP22CE	
#2 Pump Tube (Package of 2)	(ferrules 6mm & duckbills included)	PK	UC2FDCE	
#3 Pump Tube (Package of 2)		PK	UCCP23CE	
#3 Pump Tube (Package of 5)		PK	MCCP23CE	
#4 Pump Tube (Package of 2)		PK	UCCP24CE	
#4 Pump Tube (Package of 5)		PK	MCCP24CE	
#5 Pump Tube (Package of 2)		PK	UCCP25CE	
#5 Pump Tube (Package of 5)		PK	MCCP25CE	
#7 Pump Tube (Package of 2)	Single Head Only	PK	UCCP27CE	
#7 Pump Tube (Package of 5)	Single Head Only	PK	MCCP27CE	
#7 Pump Tube (Package of 2)	(ferrules 6mm & duckbills included)	PK	UC7FDCE	

Adapter Pump Heads (pump tube included)

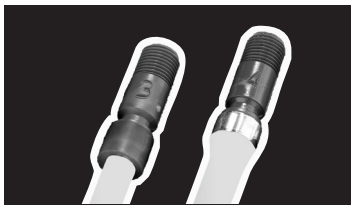
		UM	Part No.	
#1 Adapter Pump Head (Package of 1)		PK	UC1ATC1	For Double Head and Dual Head Dual Control Pumps Only
#1 Adapter Pump Head (Package of 2)		PK	MC1ATC1	
#1 Adapter Pump Head (Package of 1)	(ferrules 1/4" & duckbills included)	PK	UCAH1FD	
#2 Adapter Pump Head (Package of 1)		PK	UC1ATC2	
#2 Adapter Pump Head (Package of 2)		PK	MC1ATC2	
#2 Adapter Pump Head (Package of 1)	(ferrules 1/4" & duckbills included)	PK	UCAH2FD	
#3 Adapter Pump Head (Package of 1)		PK	UC1ATC3	
#3 Adapter Pump Head (Package of 2)		PK	MC1ATC3	
#4 Adapter Pump Head (Package of 1)		PK	UC1ATC4	
#4 Adapter Pump Head (Package of 2)		PK	MC1ATC4	
#5 Adapter Pump Head (Package of 1)		PK	UC1ATC5	
#5 Adapter Pump Head (Package of 2)		PK	MC1ATC5	

Prime Point

Schedule a regular pump tube maintenance change-out to prevent chemical damage to the metering pump or possible chemical spills.



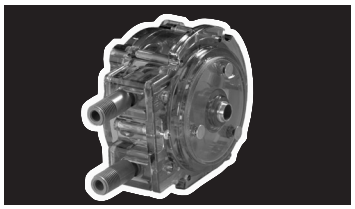
#1 & #2 Pump Tube



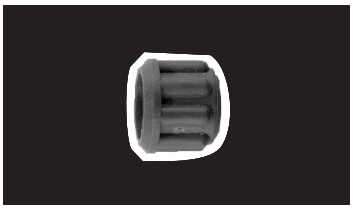
#3 & #4 Pump Tube

#5 Pump Tube

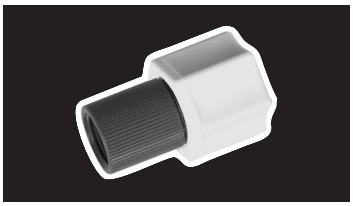
#7 Pump Tube



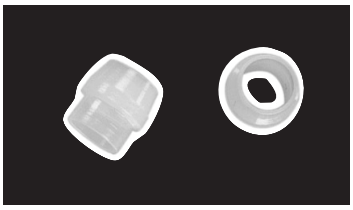
Adapter Pump Head



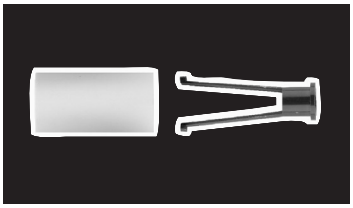
Connecting Nut 1/4"



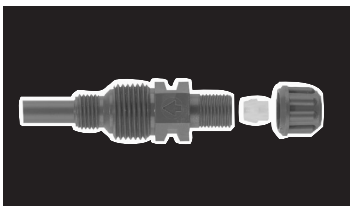
Connecting Nut 3/8" with Adapter



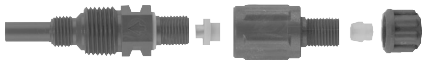
Ferrules



Ceramic Weight with Clip



Injection Fitting 1/4"



Injection Check Valve 1/4"

Miscellaneous Parts

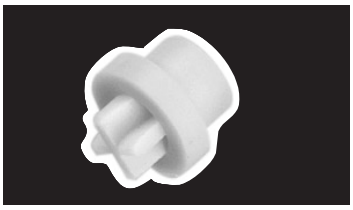
	UM	Part No.
Connecting Nut 1/4" (Package of 10)	PK	UCAK100
Connecting Nut 1/4" (Package of 24)	PK	MCAK100
Connecting Nut 3/8"	EA	MANUT00
Connecting Nut 3/8" with Adapter (Package of 2)	PK	UCADPTR
Connecting Nut 3/8" with Adapter (Package of 5)	PK	MCADPTR
Injection Point Cap 1/4" (Package of 5)	PK	UCAK101
Injection Point Cap 1/4" (Package of 24)	PK	MCAK101
Ferrule 1/4" (Package of 10)	PK	UCAK200
Ferrule 1/4" (Package of 24)	PK	MCAK200
Ferrule 6mm (Package of 24) *Europe*	PK	MCAK2CE
Ceramic Weight w/ 1/4" clip (Package of 1)	PK	UCMACW0
Ceramic Weight w/ 1/4" clip (Package of 5)	PK	MCMACW0
Ceramic Weight w/ 3/8" clip (Package of 1)	PK	UCMAC38
Ceramic Weight w/ 3/8" clip (Package of 5)	PK	MCMAC38
Ceramic Weight w/ 6mm clip (Package of 1) *Europe*	PK	UCMACCE
Suction/Discharge Tubing UV Black 20' x 1/4"	EA	AK4002B
Suction/Discharge Tubing White 20' x 1/4"	EA	AK4002W
Suction/Discharge Tubing UV Black 100' x 1/4"	EA	AK4010B
Suction/Discharge Tubing White 100' x 1/4"	EA	AK4010W
Suction/Discharge Tubing UV Black 1000' x 1/4"	EA	AK4100B
Suction/Discharge Tubing White 1000' x 1/4"	EA	AK4100W
Suction/Discharge Tubing UV Black 20' x 3/8"	EA	MALT02B
Suction/Discharge Tubing White 20' x 3/8"	EA	MALT002
Suction/Discharge Tubing UV Black 100' x 3/8"	EA	MALT10B
Suction/Discharge Tubing White 100' x 3/8"	EA	MALT010
Suction/Discharge Tubing UV Black 1000' x 3/8"	EA	MALTB10
Suction/Discharge Tubing White 1000' x 3/8"	EA	MALT100
Suction/Discharge Tubing White 20' x 6mm *Europe*	EA	AK20W6M
Suction Line Strainer with Ferrule & Nut 1/4"	EA	MASST00
Suction Line Strainer with Ferrule & Nut 3/8"	EA	MASST03
Grease (8 oz. tube)	EA	MAGCSGR

Check Valve Parts

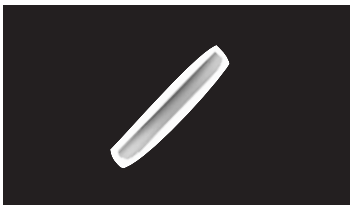
	UM	Part No.
Injection Fitting w/ Nut & Ferrule 1/4" (Package of 1)	PK	UCAK300
Injection Fitting w/ Nut & Ferrule 1/4" (Package of 5)	PK	MCAK300
Injection Fitting w/ Nut & Ferrule 6mm (Package of 1) *Europe*	PK	UCAK3CE
Injection Check Valve 1/4" (Package of 1)	PK	UCDBINJ
Injection Check Valve 1/4" (Package of 5)	PK	MCDBINJ
Injection Check Valve 3/8" (Package of 1)	PK	UCINJ38
Injection Check Valve 3/8" (Package of 5)	PK	MCINJ38
Injection Check Valve 6mm (Package of 1) *Europe*	PK	UCINJCE

Check Valve Parts...Continued

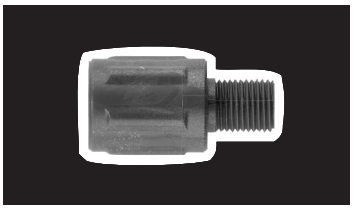
	UM	Part No.
Check Valve Duckbill Only (Package of 2)	PK	UCCVDB0
Check Valve Duckbill Only (Package of 5)	PK	MCCVDB0
Check Valve Body Only 1/4"	EA	CVF1/4
Check Valve Body Only 3/8"	EA	CVF3/8
Check Valve Injection Fitting Only 1/4"	EA	CVIJ1/4
Check Valve Injection Fitting Only 3/8"	EA	CVIJ3/8
Check Valve O-Ring	EA	CVIJOR



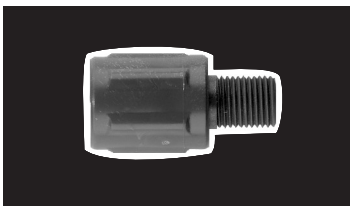
Check Valve Duckbill



Check Valve O-Ring



Check Valve Body Only 1/4”



Check Valve Body Only 3/8”

Accessory Kits

Accessories in each kit are based on pressure rating (25 psi or 100 psi), connection size (1/4", 3/8" or 6mm) and suction/discharge color. Double Head or Dual Control models will have two kits per metering pump.

- **(3) Connecting nuts (1/4" or 3/8")**
- **(3) Ferrules w/1/4" & 6mm or (2) ferrules w/3/8"**
- **(1) Injection check valve (0-100 psi) or (1) Injection Fitting (0-25 psi)**
- **(1) Ceramic weight with clip**
- **(1) 20' roll of suction & discharge tubing**
  1/4" or 3/8" white or UV black
  OR
  6mm (Europe) white
- **(1) Spare pump tube**
- **(1) Installation and maintenance manual**

High Pressure (0-100 psi) Choose #1, 2 or 7 pump tube

	UM	Part No.
Accessory Kit with #__ Tube & 1/4" White Suction/Discharge	EA	HPACK-__
Accessory Kit with #__ Tube & 1/4" UV Black Suction/Discharge	EA	HPACK__B
Accessory Kit with #__ Tube & 3/8" White Suction/Discharge	EA	MAHPK-__
Accessory Kit with #__ Tube & 3/8" UV Black Suction/Discharge	EA	MAHPK__B
Accessory Kit with #__ Tube & 6mm White Suction/Discharge *Europe*	EA	CEHPK-__

Low Pressure (0-25 psi) Choose #1-5 pump tube

	UM	Part No.
Accessory Kit with #__ Tube & 1/4" White Suction/Discharge	EA	CPACK-__
Accessory Kit with #__ Tube & 1/4" UV Black Suction/Discharge	EA	CPACK__B
Accessory Kit with #__ Tube & 3/8" White Suction/Discharge	EA	MAACK-__
Accessory Kit with #__ Tube & 3/8" UV Black Suction/Discharge	EA	MAACK__B
Accessory Kit with #__ Tube & 6mm White Suction/Discharge *Europe*	EA	CEACK-__

LIMITED WARRANTY AND SERVICE POLICY

Damaged or Lost Shipments

UPS and prepaid 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.

Returns

Stenner offers a 30-day return policy. Except as otherwise provided, no material will be accepted for return after 30 days from purchase. To return merchandise at any time, call Stenner at 800-683-2378 for a Returned Goods Authorization (RGA) number. A 15% re-stocking fee will be applied. Include a copy of your invoice or packing slip with your return.

Limited Warranty

G. H. Stenner & Co., Inc. will for a period of one (1) year from the date of purchase (proof of purchase required) repair or replace – at our option – all defective parts. G. H. Stenner & Co., Inc. 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. G. H. Stenner & Co., Inc. 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. G. H. Stenner & Co., Inc. limits its liability solely to the cost of the original product. We make no other warranty expressed or implied.

Disclaimer

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

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Hours of Operation (EST):
Mon. – Thu. 7 AM – 5 PM
Friday 7 AM – Noon