

Instruction Manual

Rough-In, Assembly, Installation, Operation, & Maintenance

Sage Systems Remote Models

High Pressure Sanitizing Systems

Models SRW- and SR-

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Warranty

Sage Systems warrants to the original purchaser, other than for purposes of resale, that all Sage Systems products shall be free from defect in workmanship and materials for a period of one (1) year from installation. Under no circumstance shall Sage Systems be liable to the purchaser or any other person for any loss of use of the product or any special or consequential costs, expenses, or damages whatsoever arising out of Breach of Warranty, Breach of Contract, or otherwise incurred by the purchaser or any other user.

Liability under this warranty is limited to Sage Systems or Sage Systems authorized repair or replacement of the material found to be defective, after proper examination by Sage Systems authorized personnel during the warranty period. Before any in field warranty service can be performed, the owner must contact our dedicated Sage Service Technician at USA 888-757-3784 or Rest of the World +44 (0) 1793 603488. This warranty does not cover products that have been altered or modified after purchase, or for defects caused by physical abuse or misuse of the product.

Any express warranty not provided herein and any remedy for Breach of Contract which but for this provision might arise by implication or operation of law, are hereby excluded and disclaimed. Any implied warranties of merchantability or fitness for a particular purpose are limited in duration to the above one year period.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damage. Therefore, all the above limitations or exclusions appearing herein may not be permitted. Local statutes should be consulted with respect thereto, or to any other rights which your state statutes may specifically confer on the purchaser.

Safety Introduction

Warning! When using this product, basic precautions should always be followed, including the following

Read all instructions before using the product.

To reduce the risk of injury, close supervision is necessary if a product is used near children.

Know how to stop the product and bleed the pressure quickly. Be thoroughly familiar with the controls. Stay alert, and watch what you are doing.

Do not operate the product when you are fatigued or under the influence of alcohol or drugs.

Keep the operating area clear of all persons

Do not overreach or stand on unstable supports. Keep good footing and balance at all times.

Follow the maintenance instructions specified in the manual.

This product requires the use of a Ground Fault Circuit Interrupter (GFCI) built into the supplying power line.

If replacement of electrical components is needed, use only identical replacement parts.

Warning! Risk of infection or injury – Do not direct discharge at persons.

Grounding Instructions

This product must be grounded. If it should malfunction or break down, grounding provides a path of least resistance for electrical current to reduce the risk of electric shock. This product is equipped with a Master Control Panel, which should be properly installed and grounded in accordance with all local codes and ordinances.

Danger! Improper connection of the equipment grounding conductor can result in a risk of electrocution.

Check with a qualified electrician or service personnel if you are in doubt as to whether the power supply line is properly grounded.

Do not modify the Master Control Panel provided with the product. If necessary, have a qualified electrician complete or check the installation to insure proper grounding.

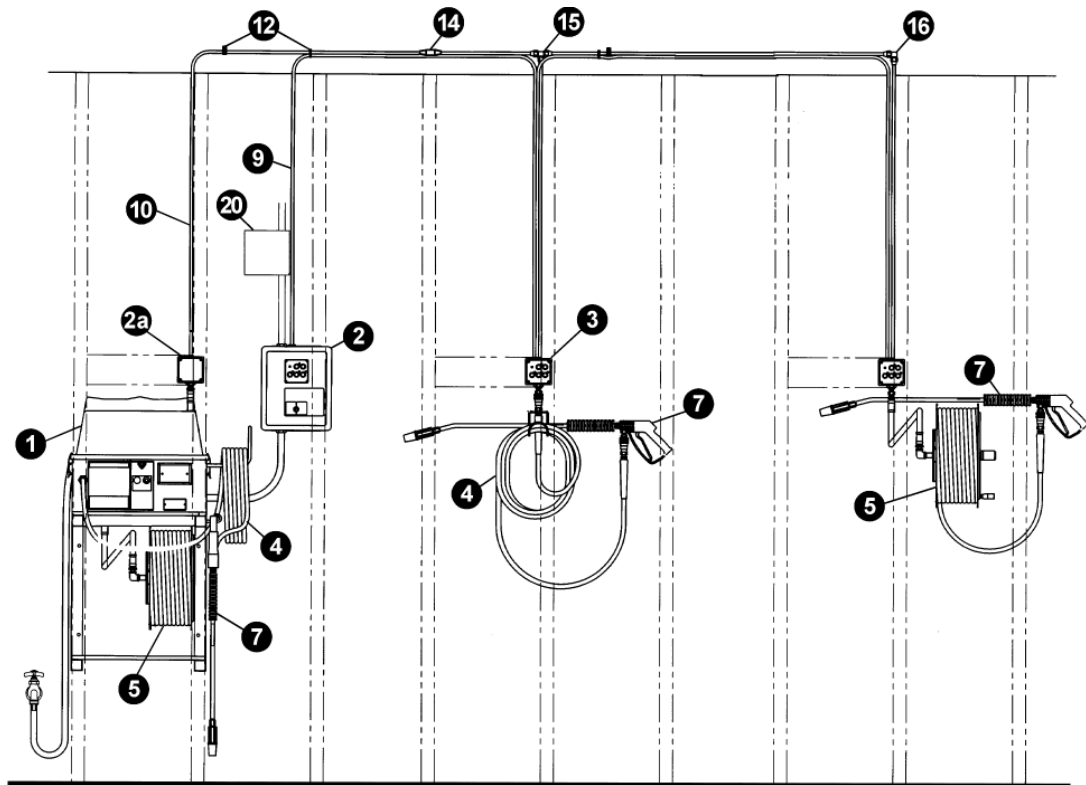
Ground Fault Circuit Interrupter Protection

This pressure washer requires the installation of a Ground Fault Circuit Interrupter (GFCI) onto the incoming power lines before the Master Control Panel. This device provides additional protection from the risk of electric shock. Consult a qualified electrician should repair or replacement of the GFCI become necessary.

Warning! To reduce the risk of electrocution, keep all wires, switches, and wire connections free of excess exposure to water and in good condition. Do not touch electrical systems with wet hands.

Caution! Consult with the factory before using a nozzle other than the one provided with this machine.

Save these Instructions



System Components

Components included with Sage Remote Wall-mount System, SRW- models, to be assembled and installed.

Master Control Panel (MCP) (2) and Manifold (2a)

MCP powers machine motor and transforms incoming power to a safe 24 Volt for the remote network.

Manifold connects Machine to the high-pressure stainless steel tubing network.

Machine (1)

Pressurizes incoming water and injects chemicals.

Wall Bracket, Water Inlet, and Water Supply Hose

Wall Bracket mounts to the wall and supports the Machine.

Water Supply Hose connects incoming water to the Machine.

High pressure Hose (4)

Connects Machine or Remote Panel to Spray Gun

Hose Reel (Optional) (5)

Connects Machine or Remote Panel to Spray Gun

Spray Gun Assembly (7)

Dispenses pressurized spray

Remote Panel (3)

Provides access to the high pressure Tubing network at remote locations.

Remote Cover (Optional)

Covers and locks the Remote Panel for vandal resistant locations.

Supplies Necessary

Ground Fault Circuit Interrupter (GFCI) (20)

Required but not supplied with system. 30 amp recommended.

Stainless Tubing (10)

3/8 in (9.5 mm) OD x 22 gauge Tubing connects Machine through Manifold to all Remote Panels.

Tubing network hardware (14) (15) (16)

Union, Elbow, and Tee Flare fittings to connect runs of stainless tubing

Flaring Tool


SAE tool to flare 3/8 in tubing to accept Union, Elbow and Tee flare fittings noted above.

Clamps & Ties

Cushioned Clamps for attaching Tubing to walls or ceilings, and Ties for attaching Wire to the Tubing.

Remote Wire

12 conductor 18 gauge wire connects Machine through Master Control Panel to all Remote Panels



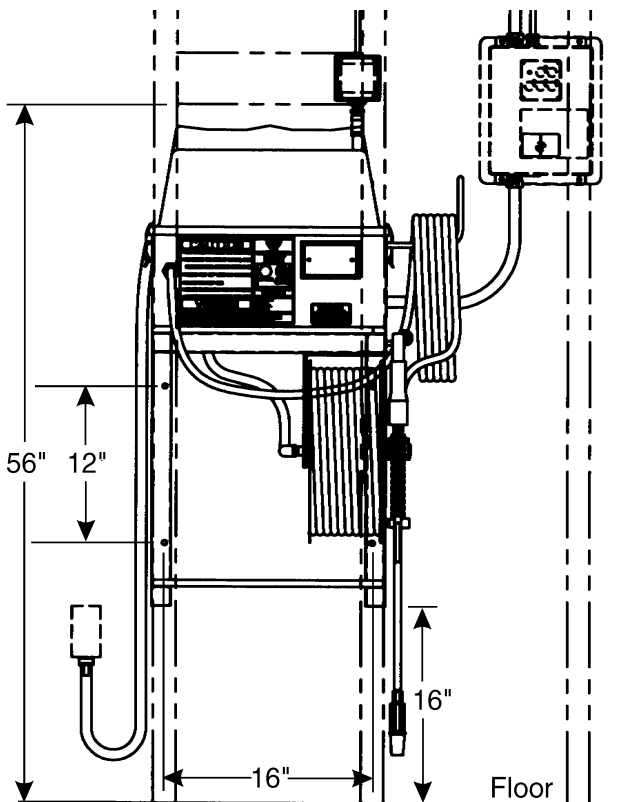
Rough-In

This section is intended to give general guidelines for site preparation and rough-in. Dimensions or suggested locations described in this section are based on standard mounting specifications and may vary to meet special installation requirements or conditions. All rough-in items should be completed before walls, floors, or ceilings are finished.

Construction

At the time of wall construction, there are four critical preparation issues for a Sage Systems Remote System.

Wall Bracket



The Wall Bracket will support approximately 200 pounds (91 kg) of Machine and accessories. Also, the Wall Bracket has four 3/8" holes spaced in a rectangular pattern 16 in (40.6 cm) wide and 12 in (30.5 cm) high. The wall and wall supports should be constructed to accommodate these dimensions and weight. The lowest two holes should be at least 16 in (54 cm) above the floor, to insure enough clearance for chemical containers. Wood studs on 16 in (40.6 cm) centers will accept four 5/16 in x 6 in long (8 mm x 15 cm long) lag screws. Masonry surfaces will accept four 5/16 in (8 mm) anchor bolts.

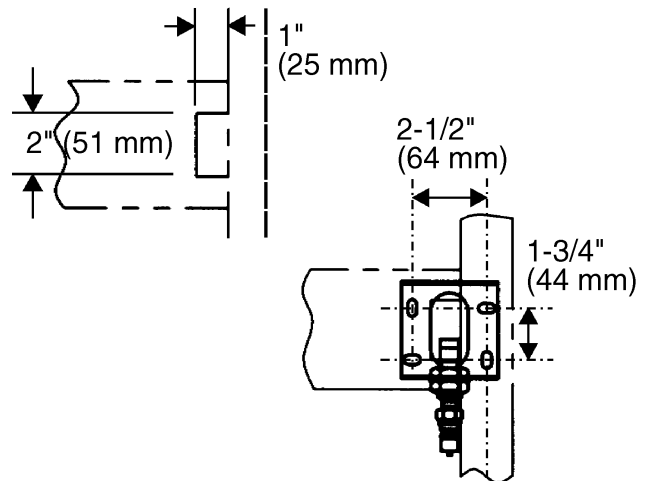
Manifold and Remote Panel

The Manifold and Remote Panel attach to the wall the same. The mounting bracket has four 5/16 in (8 mm) holes spaced in a rectangular pattern 2.5 in (63.5 mm) wide and 1.75 in (44.5 mm) high.

A horizontal support board is required for positioning of the Wire and Tubing at completion of the wall, and to provide solid mounting support behind the wall surface for the Manifold or Remote Panel.

The support is a 2 in x 4 in (5 cm x 10 cm) board installed between studs at Manifold and all Remote Panel locations. The bottom of the support should be at least 54 in (137 cm) above the floor.

The face of this support needs to be flush with the edge of the studs on each side. At one end of the support board,



where the Manifold or Remote Panel will mount, notch the board 2 in x 1 in (5 cm x 2.5 cm). This slot will allow clearance for the Wire and/or Tubing to enter the Manifold or Remote Panel.

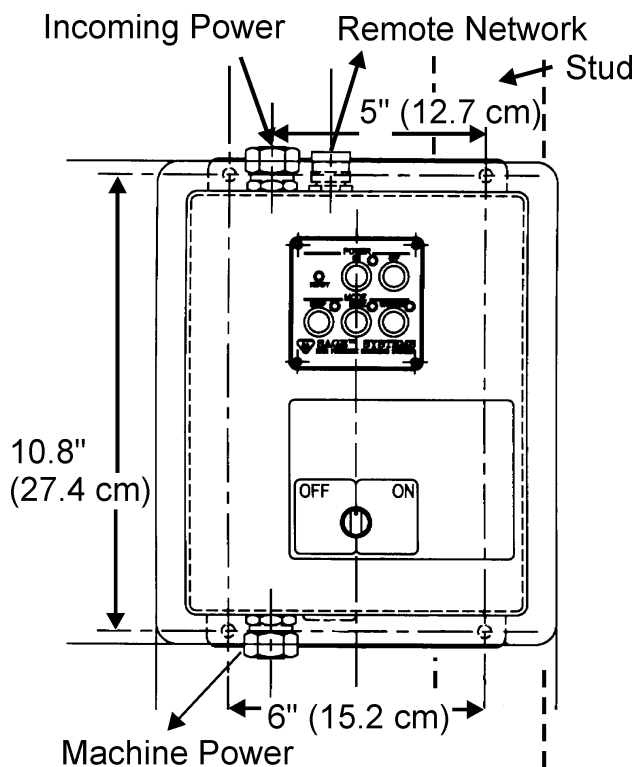
The Manifold support board should be between the same studs where the Machine will mount. The Manifold should mount above the right side of the Machine.

Master Control Panel

The Master Control Panel (MCP) also attaches to the wall near the Machine. The MCP has four 5/16 in (8 mm) holes spaced in a rectangular pattern 6 in (15 cm) wide and 10.75 in (27.3 cm) high.

The right two holes mount to the next stud 16 in (40.6 cm) to the right of the Machine support studs, approximately 48 in (12 cm) above the floor.

The left two holes of the MCP can fasten either to the finished wall material or to optional support board(s) behind the wall surface. The face of any supports needs to be flush with the edge of the studs on each side.



Hose Reel at the Remote Panel (Optional)

A Hose Reel can attach to the wall at the Remote Panel. The Reel bracket has three 0.62 in (0.16 cm) holes with 0.31 in (0.79 cm) slots spaced in a straight vertical line 3 in (7.6 cm) apart. The bracket also has two short slots of the same width 4.5 in (11.4 cm) to the left of the top and bottom holes with slots.

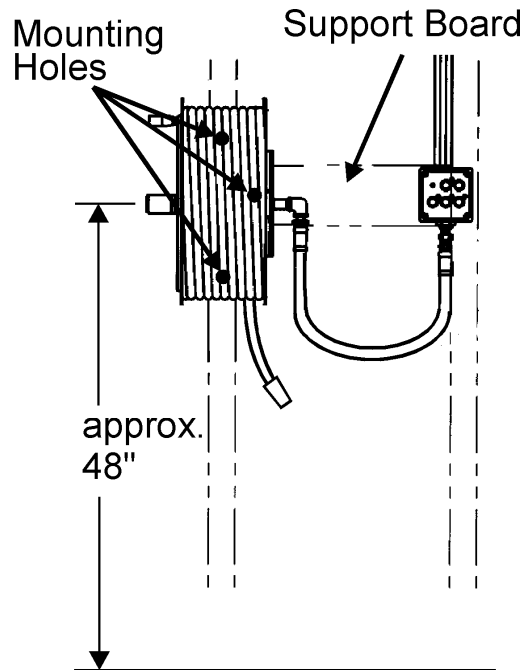
The three holes with slots should mount to the next stud 16 in (40.6 cm) to the right or left of the Remote Panel, approximately 48 in (12 cm) above the floor.

The two short slots can either mount to anchors in the wall itself, or to an optional support board, for strength and stiffness, perhaps even the same support board already mounted for the Remote Panel itself.

Remember, the face of any supports needs to be flush with the edge of the studs on each side.

Machine Electrical

Remote Systems require one dedicated 20 amp appliance circuit for 115 Volt 60 Hertz, or one dedicated 10 amp appliance circuit for either the 230 Volt 50 Hertz or 230 Volt 60 Hertz systems. This dedicated circuit supplies power to the Master Control Panel (MCP).



Caution! The installation of a Ground Fault Circuit Interrupter (GFCI) on the incoming power line before the MCP is required though not provided. The GFCI is essential to personal safety.

Run the dedicated line in conduit to the GFCI, not provided. Then run the outlet line from the GFCI in conduit so that the outlet is located approximately 60 in (152 cm) above the floor and 12 in (30 cm) right of the Machine. Leave approximately 1 ft (30.5 cm) of wire exposed for connection to the MCP.

Machine Plumbing

All machines require a water connection with shut-off ability and a 3/4" garden hose thread outlet. The machine requires a minimum of 4.0 gpm (15 lpm) at no less than 30 psi (2 bar).

Recommended water temperature may vary depending on the chemical(s) selected. However, typical soap and sanitizing solutions work best with water between 120°F and 150°F. Maximum water temperature for all Sage Systems machines is 160°F.

A single temperature faucet is acceptable if the provided water is less than 160°F, and if the provided water temperature is appropriate for all chemicals desired. In some cases, a separate tempering device before the faucet may be necessary.

A mixing faucet may be required if the provided water temperature needs to vary depending on the application. In these cases, the maximum hot water temperature supplied to the mixing faucet should not exceed 160°F. Also, a thermometer to measure the outlet water's temperature is suggested.

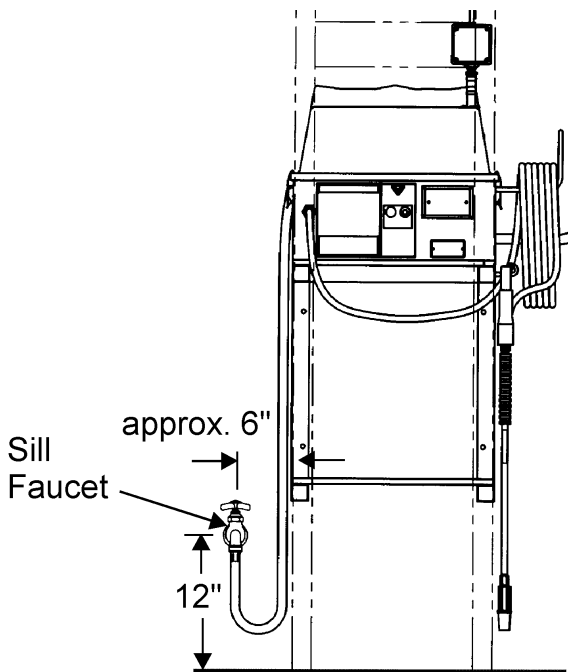
3 options

- 1 160°F (71°C) water straight to a sill faucet
- 2 180°F (82°C) water mixed through a temperature control device to a sill faucet
- 3 160°F (77°C) water and cold water mixed at a two handle faucet

Note! Some chemicals may lose their effectiveness if mixed with water too hot.

Check with your probable chemical suppliers for the optimal application temperature for each set of circumstances.

Locate the Sill Faucet approximately 6 in (15 cm) left of the Machine and 12 in (30 cm) above the floor.



Remote System Electrical

All low voltage Remote Wiring comes under class 2 wiring specifications as the power supply for this wiring is a UL listed Class 2 transformer with a 24 Volt 40 VA output. Under the National Electrical Code, conduit is not required for 24 Volt control circuits except where wiring is in an unprotected area.

The Sage Systems Remote network requires 12 conductor 18 gauge wire to connect the Machine through Master Control Panel to all Remote Panels in either series or parallel. In other words, separate lines may run from the MCP to each Remote Panel, or a single line may run from the MCP with branches to each Remote Panel. This Wire is typically available in 250 ft (76 m) coils.

The Remote Wire starts at the MCP. Run the Remote Wire in conduit from the MCP to the ceiling, or nearest point where the Wire can mate up with the Tubing. The conduit should stop approximately 60 in (152 cm) above the floor and 14 in (35 cm) right of the machine, or 2 in (5 cm) to the right of the main power line from the GFCI. Leave at least 12 in (30.5 cm) of Wire protruding from the conduit for hook-up to the MCP. Remote Wire typically follows the high pressure Tubing runs from a mating point near or above the MCP to all Remote Panels. A 1 in (2.5 cm) hole provides enough clearance through walls or stud for Tubing and Wire. However, if it would be more convenient, the Wire can be run independently of the Tubing.

Ending point for each branch of Wire is at the Remote Panel locations, approximately 48 in to 60 in (122 cm to 152 cm) above the floor. Leave at least 8 in (20 cm) of Wire protruding from the wall for hook-up to the Remote Panel. Tape exposed Tubing and Wire together, and tag with the following statement.

Wall Contractor: leave Wire and Tubing exposed through 1" (2.5 cm) hole in finished wall. Do not damage wire or kink tubing.

Remote System Plumbing

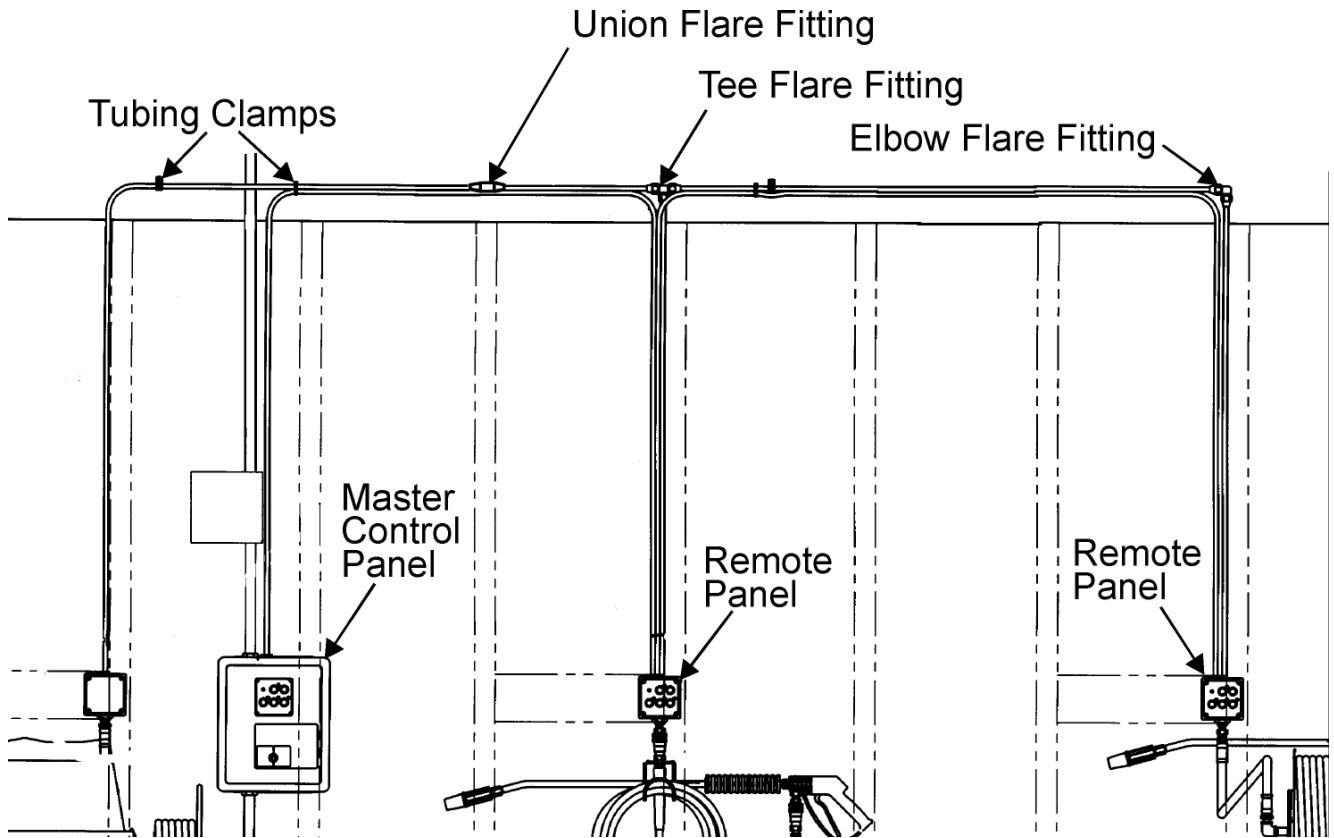
The recommended tubing for Sage Systems Remote systems is 3/8 in (9.5 mm) OD x 22 gauge (0.028 in / 0.07 cm wall) stainless steel Tubing. This tubing connects the Machine through the Manifold to all Remote Panels. This annealed stainless tubing is typically available in 50 ft (15 m) coils. Connections at all joints are made with flare fittings.

Note! Access to all joint or fittings should be provided for check and maintenance purposes.

Internal Tubing Warnings

Tubing is typically run inside the wall or above ceiling areas at rough-in.

Protect Tubing from nailing by leaving enough clearance from nailing surfaces, locating away from nailing hazards, or shielding with metal plates.



Do not locate tubing in areas subject to freezing temperatures.
 Make all bends in the Tubing, especially those less than 3 in (7.5 cm) radius, with a tubing bending tool to prevent kinking.
 Tubing should not come in contact with any sharp or protruding objects.
 Fasten the tubing securely to the building structure with rubber cushioned straps every 3-4 ft (90-120 cm) to eliminate vibration.

External Tubing Option

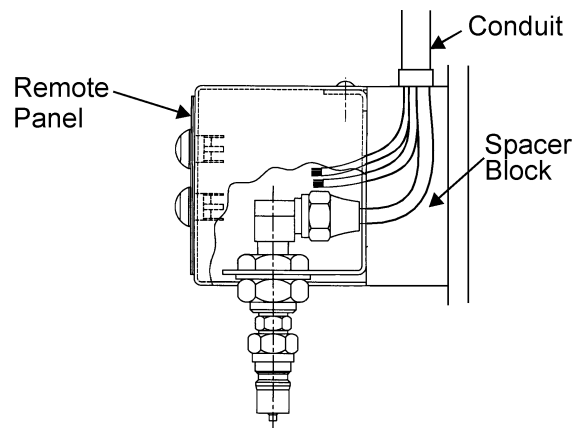
Some installations may require or prefer the Tubing to run externally (not concealed behind walls or above ceilings). For these installations, the Manifold and Remote Panels are spaced out from the wall by use of a 1½ in (3.8 cm) thick Spacer Block. This Block allows the Tubing to lay along the surface of the wall, enter into a groove along the back of the Block, and turn 90° to attach to the standard provided flare fittings. The perimeter and grooves of the Spacer Block should be caulked after installation for water tightness.

Tubing Runs

Begin Tubing runs at the Manifold, approximately 6 in (15 cm) above the right edge of the Machine, at the notch in the Manifold support board. Typically, the tubing runs up above ceiling level and either bends, elbows, or tees to provide tubing runs to the rest of the network.
 Continue Tubing runs along the planned route or another convenient route that reaches from the Manifold location to all Remote Panel locations.

Leave approximately 4 in (10 cm) protruding straight out from the notch in each support board.

Note! The Sage Systems authorized Service Agent will want to pressure test the entire network at Start-Up.

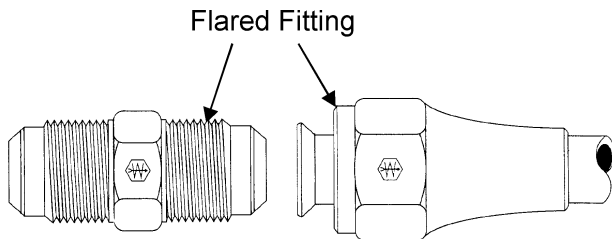


Flared Fittings

Flare fittings offer excellent resistance to vibration when longer tubing runs are used, and are used with tubing whose diameter and thickness allows flaring. Use Union Flare fittings to connect Tubing runs. Use Elbow Flare fittings to change direction sharply, as in a tight drop down to a Remote Panel.

Note! Whenever possible, bend the tubing, with a tubing bender if necessary, in place of an Elbow fitting to reduce pressure loss through the turn.

Use Tee Flare fittings to split the main run into two, as in above the Manifold, or to continue a run while dropping a branch, as in at a Remote Panel.



Note! All required tubing bends should be done prior to the assembly of flare fittings

Cut Tubing to desired length, making sure to make a square cut and to remove all burrs after cutting.

Note! Never cut stainless tubing for flare applications with a tubing cutter. Instead, cut evenly and square with a hacksaw.

Slide the flare Nut on the tube, with the threaded end facing out, to the cut end.

Flare the end of the Tubing with a 45° flaring tool.

Measure the flare diameter and examine the flare for excess thinning or splitting of the flared Tubing wall.

Lubricate the threads and hand tighten the flare nut to the flare fitting. Further tighten the flare nut with a wrench until a solid feeling is encountered., then tighten one-sixth (1/6) of a turn further.

Note! Over-torquing may damage the fitting or split the flared tubing.

Tubing through Concrete

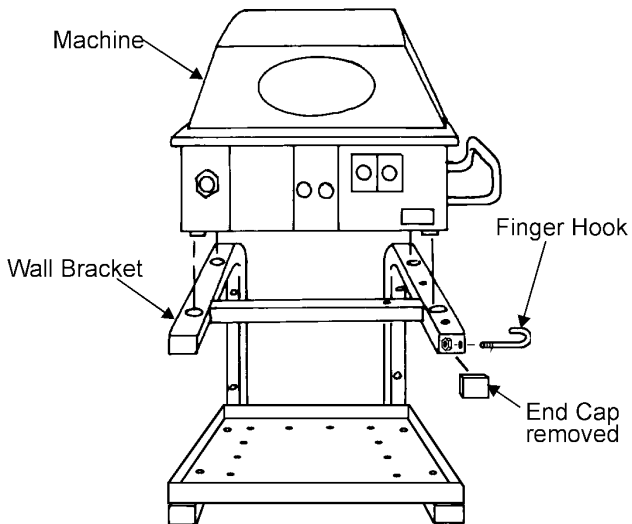
Tubing can also run through pipe prior to pouring where connection through a concrete mass is required. Leave approximately 36 in (91 cm) extending above any slab. Bend the Tubing 90° to project into or along wall frames.

Assembly

Remote systems arrive with each critical component packaged separately. Only two of the components require any assembly, in preparation for installation.

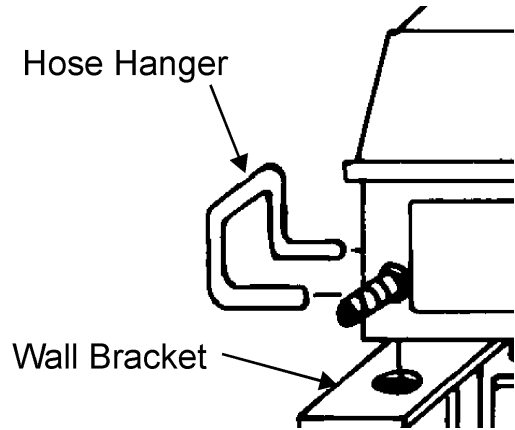
Wall Mount Bracket

Remove the black plastic end-cap from the top right side tubing on bracket. Insert the threaded end of the Gun Hook through the outside hole near the removed end-cap. Tighten the Gun Hook to the Bracket with the Lock Nut provided so that the hook aims up to the ceiling. Replace the end-cap.



Machine

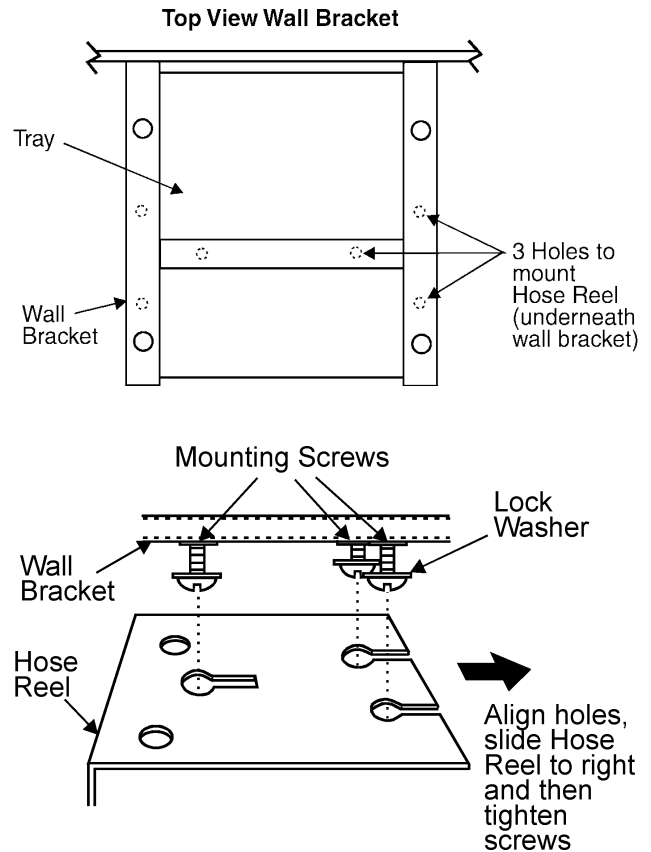
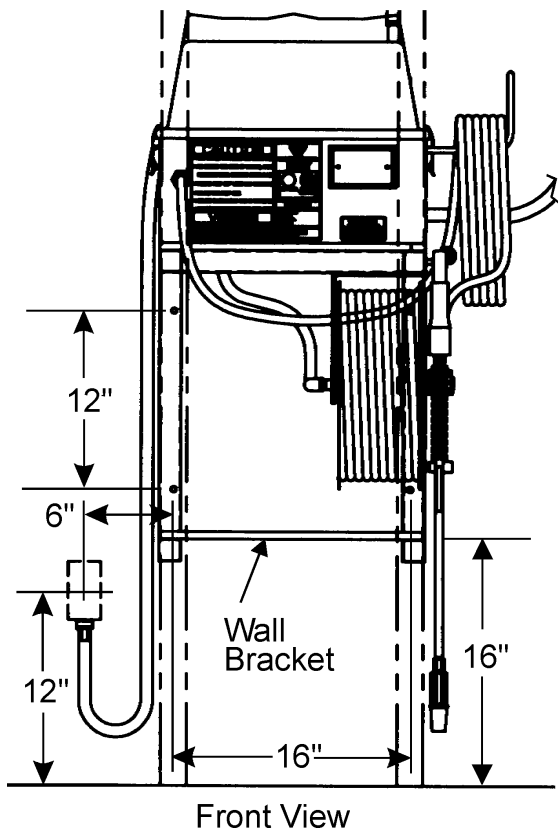
Align the stainless Hose Hanger with the holes in the side of the Machine. Attach the Hanger to the Machine with the two ½ in (1.3 cm) long bolts provided.



Installation

Wall Mount Bracket

Position the Wall Mount bracket on the wall at the desired location. Keep the bottom of the bracket at least 16 in (40.6 cm) above the floor, to insure enough clearance for chemical containers.



Note! Do not tighten these screws all the way at this time. Instead, start them by hand only 2-3 turns.

Attach the Bracket to the wall with the appropriate hardware (not provided) for the installation. Wood studs on 16 in (40.6 cm) centers will accept four 5/16 in x 6 in long (8 mm x 15 cm long) lag screws. Masonry surfaces will accept four 5/16 in (8 mm) anchor bolts.

Machine

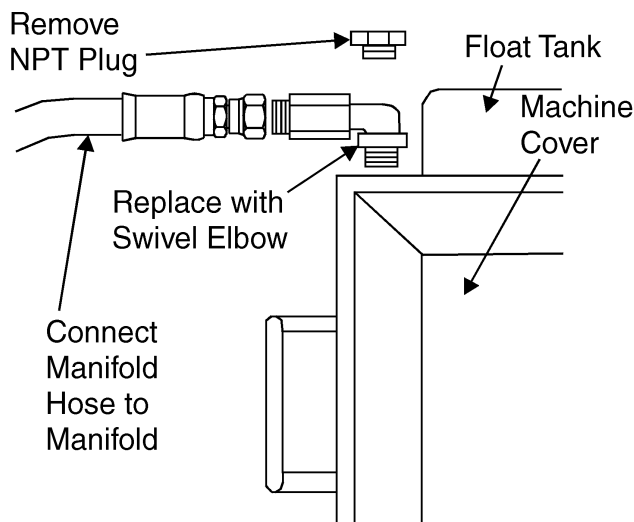
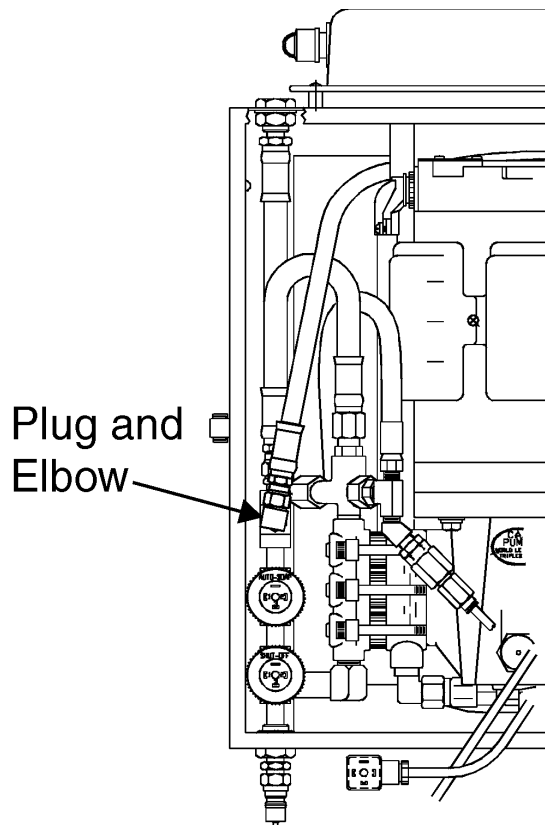
Place the Sage Systems Machine onto the Bracket, with labels facing away from the wall. Align the four holes in the top of the Bracket with the rubber pads on the bottom of the Machine.

Secure the Machine to the Bracket with the four 1-3/4 in (4.4 cm) long screws provided with the Bracket.

Hose Reel (Optional)

Place the 1/4 in (6.4 mm) internal tooth washers over the 3/4 in (19 mm) long screws, both supplied with the Hose Reel. Start these three screws into either the right or left three holes on the under side of the top of the Bracket.

Align the center hole and two short slots in the Hose Reel Bracket with the three screws in the Wall Bracket. Slide the Hose Reel into place, with the screw head and washer over thin part of the slots in the Hose Reel Bracket. Tighten the three mounting screws. Remove the yellow cover from the Machine. Find and remove the 1/4 in (6.4 mm) brass plug on far left of the inside of the machine, in the third position after the two pressure switches, facing up. Replace the plug with the brass NPT-to-Flare Elbow supplied with the Hose Reel. The NPT threads fit the hole where the plug was removed. The flare threads will mate with the supply hose to the Hose Reel. Tighten the elbow until the NPT threads seal, and until the flare threads face the rear of the machine, then tighten 10°-15° counter right. Work the black supply hose from the Hose Reel up through the bottom of the Machine, between the left side of the Machine and motor/pump assembly. Tighten the swivel fitting on the supply hose to the flare threads of the elbow just installed.



Top View Machine

Manifold, Plumbing

Find the stainless tubing protruding straight out from the finished wall just above the Machine. Cut this Tubing to be perpendicular to the wall and approximately 1-1/2 in (3.8 cm) from the finished wall surface.

Note! Never cut stainless tubing for flare applications with a tubing cutter. Instead, cut evenly and square with a hacksaw.

Make sure all burrs are removed and ends are cut square.

Disassemble the Manifold cover from the Manifold bracket with fitting and hose. Remove the flare nut from the fitting inside the Manifold.

Slide the flare nut onto the tubing with the threaded end facing out, to the cut end.

Flare the end of the Tubing with a 45° flaring tool for stainless of 3/8 in (0.95 cm) diameter.

Inspect the flare for an even symmetric shape without any excess thinning or splitting of the stainless.

Maximum diameter of the flare should not exceed 5/16 in (1.43 cm).

Mount the bracket securely to the wall with four fasteners. The flared tubing with nut should mate with the flare fitting when the Manifold bracket is tightened to the wall. Fasteners are not supplied, and should be chosen as best for the wall material. Remember the recommended horizontal support board behind the finished wall when selecting fasteners.

Lubricate the threads and hand-tighten the flare nut to the flare fitting. Further tighten the flare nut with a wrench until a solid feeling is encountered., then tighten one-sixth (1/6) of a turn farther.

Note! Do not over torque, as it may damage the fitting or split the flared Tubing.

Replace the Manifold cover with two top screws. Locate and remove the 1/4 in (6.4 mm) brass plug on the back outside of the machine, on the left, facing the wall. Replace the plug with the brass NPT-to-Flare Elbow supplied with the Manifold. The NPT threads fit the hole where the plug was removed. The flare threads will mate with the supply hose to the Manifold. Tighten the elbow until the NPT threads seal, and until the flare threads face a convenient direction for connection of the Manifold hose.

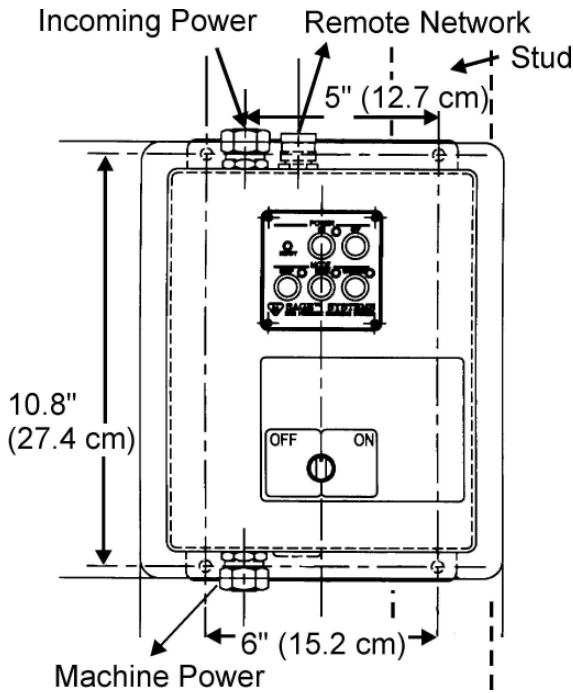
Tighten the swivel fitting on the black supply hose to the flare threads of the elbow just installed.

Master Control Panel, Electrical

The incoming power line should already be available just above the mounted Master Control Panel, approximately 60 inches off the floor, and 12 in (30 cm) right of the Machine. As a check make sure that the incoming power is on a dedicated 20 amp circuit, that a GFCI (not supplied) of some sort is installed on the line, and that the line is not live.

The Master Control Panel has three ports, two on top, one on bottom. The top left is for incoming power. The top right is for the remote network. The bottom is for machine power.

Feed the 18 in (45 cm) of exposed power wire through the left top port. Use the port fittings to make the wire secure both to its conduit and to the Master Control Panel itself.



Feed the 18 in (45 cm) of exposed Remote wire through the right top port. Use the port fittings to make the wire water tight and secure to the Master Control Panel. Feed the power supply wires from the Machine into the bottom port of the Master Control Panel. Use the fitting to make the gray cover secure and water tight to the MCP.

Use the supplied wiring schematic inside the MCP to connect all three sets of wires. The table below matches the schematic and can be used to connect all wires to the Master Control Panel.

Incoming Power	Function	MCP Connection
Black 60 Hz (Red 50 Hz)	Power	Screw Terminal 1
White 60 Hz (Black 50 Hz)	Return	Screw Terminal 3
Green	Ground	Mount Screw, upper left

Machine Power	Function	MCP Connection
Red	Machine Power	Screw Terminal 7
Black	Machine Return	Screw Terminal 4
Green	Ground	Screw Terminal 6

Machine Control	Function	MCP Connection
Red	5 Minute Time-Out Pressure Switch	TC 1
Blue	Auto-Chem Pressure Switch	TC 2
Brown	Pressure Switch Commons	TC 4
Orange	Soap Power	TC 7
Yellow	Sanitize Power	TC 8
Gray	Soap & Sanitize Commons	TC 12

Remote Control	Function	MCP Connection
Blue	Green ON switch (S1)	TC 1
Yellow	Red OFF switch (S2)	TC 2
Orange	Orange SOAP switch (S3)	TC 3
Red	Blue RINSE switch (S4)	TC 4
Brown	Green SANITIZE switch (S5)	TC 5
Black	Switch COMMON	TC 6
Blue/Black	Green ON light (L2)	TC 7
Yellow/Black	Amber SOAP light (L3)	TC 8
Orange/Black	Amber RINSE light (L4)	TC 9
Red/Black	Amber SANITIZE light (L5)	TC 10
Brown/Black	Amber READY light (L1)	TC 11
Black/Red	Light COMMON	TC 12

Remote Panel, Plumbing

Find the stainless tubing protruding straight out from the finished wall at each Remote Panel location. Cut this Tubing to be perpendicular to the wall and approximately 1-1/2 in (3.8 cm) from the finished wall surface.

Note! Never cut stainless tubing for flare applications with a tubing cutter. Instead, cut evenly and square with a hacksaw.

Make sure all burrs are removed and ends are cut square.
Disassemble the Remote cover with switch panel from the Remote bracket with fitting.

Note! Do not remove the switch panel from the Remote cover with the four screws on the front of the Panel.

Remove the flare nut from the fitting inside the Remote. Slide the flare nut onto the tubing with the threaded end facing out, to the cut end.

Flare the end of the Tubing with a 45° flaring tool for stainless of 3/8 in (0.95 cm) diameter.

Inspect the flare for an even symmetric shape without any excess thinning or splitting of the stainless. Maximum diameter of the flare should not exceed 5/16 in (1.43 cm).

Mount the bracket securely to the wall with four fasteners. The flared tubing with nut should mate with the flare fitting when the Remote bracket is tightened to the wall. Fasteners are not supplied, and should be chosen as best for the wall material. Remember the recommended horizontal support board behind the finished wall when selecting fasteners.

Lubricate the threads and hand-tighten the flare nut to the flare fitting. Further tighten the flare nut with a wrench until a solid feeling is encountered., then tighten one-sixth (1/6) of a turn farther.

Note! Do not over torque, as it may damage the fitting or split the flared Tubing.

Remote Panel, Electrical

Strip and prepare the 12 conductor remote wire. Strip the main jacket back 6 in (15 cm). Strip each conductor back 1 in (2.5 cm).

Attach each wire to the appropriate labeled wire from the switch panel with the wire nuts provided. Tape wire nuts to wire for a permanent connection. A table of wire color, function, and Remote panel tag number is outlined below as a suggested system.

<i>Remote Wire Color</i>	<i>Remote Function (Schematic)</i>	<i>Panel Wire Tag Number</i>
<i>Blue</i>	<i>Green ON switch (S1)</i>	<i>1</i>
<i>Yellow</i>	<i>Red OFF switch (S2)</i>	<i>2</i>
<i>Orange</i>	<i>Orange SOAP switch (S3)</i>	<i>3</i>
<i>Red</i>	<i>Blue RINSE switch (S4)</i>	<i>4</i>
<i>Brown</i>	<i>Green SANITIZE switch (S5)</i>	<i>5</i>
<i>Black</i>	<i>Switch COMMON</i>	<i>6</i>
<i>Blue/Black</i>	<i>Green ON light (L2)</i>	<i>7</i>
<i>Yellow/Black</i>	<i>Amber SOAP light (L3)</i>	<i>8</i>
<i>Orange/Black</i>	<i>Amber RINSE light (L4)</i>	<i>9</i>
<i>Red/Black</i>	<i>Amber SANITIZE light (L5)</i>	<i>10</i>
<i>Brown/Black</i>	<i>Amber READY light (L1)</i>	<i>11</i>
<i>Black/Red</i>	<i>Light COMMON</i>	<i>12</i>

If any substitutions or changes are made, make sure to document which color wire is attached to which Remote panel function/number. Any combination is acceptable, as long as the entire network, MCP and all Remote Panels, are wired correspondingly.

Replace the remote cover, being careful not to stress or cut any internal wires, and fasten with the two top screws.

Remote Panel Accessories

Remote Cover

Center the Remote Cover over the Remote Panel, so that the Remote Cover will close, completely encapsulating the Remote Panel and QD plug when the hose is disconnected.

Mark the end of all four slots in the Remote Cover on the wall with a pen or pencil.

Mount the Cover securely to the wall with four fasteners. Fasteners are not supplied, and should be chosen as best for the wall material. Remember the recommended horizontal support board behind the finished wall when selecting fasteners. Also, select fasteners with a head diameter small enough to fit through the hole, but large enough to tighten over the slots.

Start the chosen fasteners with only 2-3 threads. Slide the Cover into place over the fastener heads. Tighten all four fasteners.

Hose Hanger

Position the hose hanger on the wall, near the remote panel, so that the holes align with a stud or wall support structure. Attach the hanger to the wall with the appropriate hardware for the wall material. (Hardware not provided)

Hose Reel

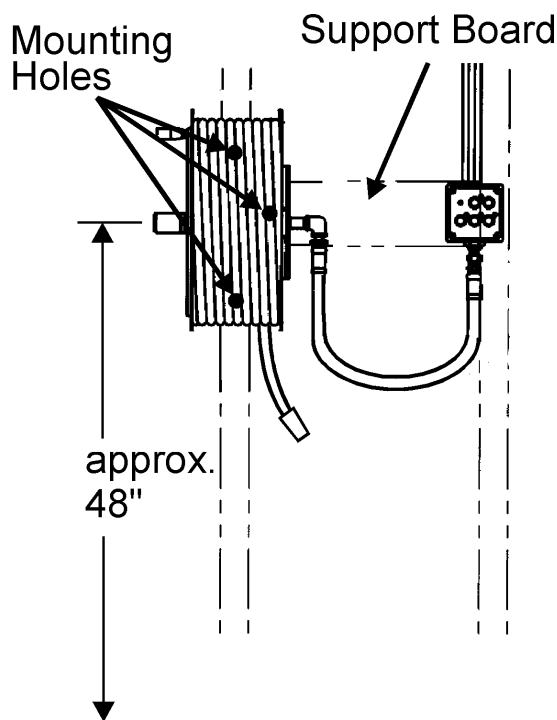
A Hose Reel can attach to the wall at the Remote Panel. The Reel bracket has three 0.62 in (0.16 cm) holes with 0.31 in (0.79 cm) slots spaced in a straight vertical line 3 in (7.6 cm) apart. The bracket also has two short slots of the same width 4.5 in (11.4 cm) to the left of the top and bottom holes with slots.

The three holes with slots should mount to the next stud 16 in (40.6 cm) to the right or left of the Remote Panel, approximately 48 in (12 cm) above the floor.

Choose the best style screw or bolt that will function with the wall construction, and support the hose reel over years of pull and use. For wood studs, try 1¼ in (3.18 cm) lag screws.

The two short slots can either mount to anchors in the wall itself, or to an optional support board, if installed at rough in.

Place the Reel on the wall and mark the end of all five slots, so that the three in line will fasten to the supporting wall stud. Start all five screws/bolts into the marks made.

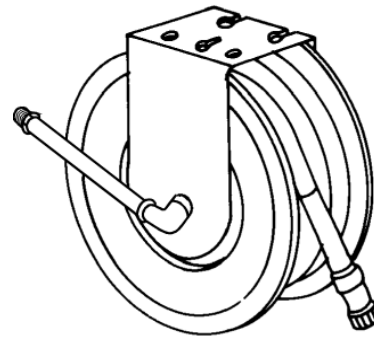


Note! Do not tighten these screws all the way at this time. Instead, start them by hand only 2-3 turns.

Align the three in line holes with the screw/bolt heads, slide the Hose Reel into place, with the screw head over the thin part of the slots in the Hose Reel Bracket.

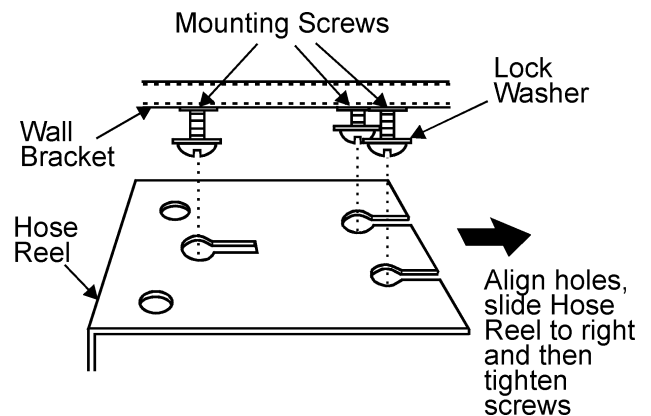
Sage Systems Technician USA/CANADA 888-757-3784

Rest of the World +44 (0)1793 603488



Tighten all five mounting screws. Remove the QD plug and hex nipple from the Remote Panel. Install the brass NPT-to-Flare Elbow supplied with

the Hose Reel. The NPT threads fit the hole where the nipple was removed. The flare threads will mate with the supply hose to the Hose Reel. Tighten the elbow until the NPT threads seal, and until the flare threads face the Hose Reel. Work or coil the black supply hose to meet the elbow. Tighten the swivel fitting on the supply hose to the flare threads of the elbow just installed.



Back to the Machine

Water Inlet

Attach the 6 ft (1.8 m) water supply hose to the nearby Sill Faucet with ¾ in (1.9 cm) garden hose thread.

Note! The machine must not be piped directly to the water source.

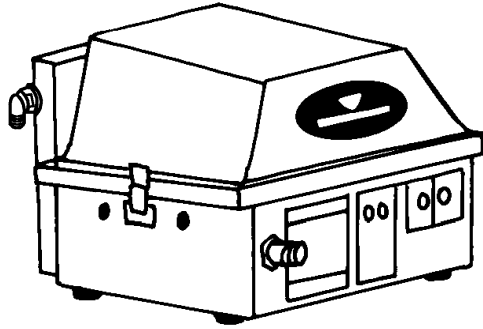
The resilience of the water supply hose is required to absorb water shock. Otherwise, the piping system for the building may shake and rattle under normal operation.

Turn on the Sill Faucet. The float tank on the back of the Machine should fill with water, and the shut off.

Note! Verify that the water level in the float tank fills to about 1" (2.5 cm) below the overflow rim.

Chemical Feed

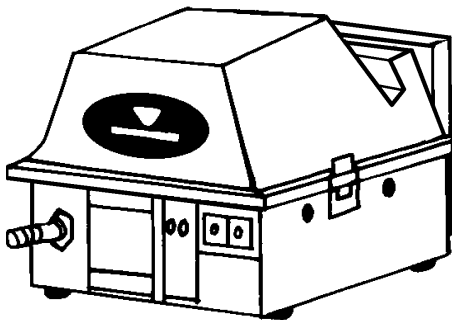
Cover without Chemical



If one poly-tubing line exits the Machine, the Machine feeds one chemical only, typically soap. If two lines exit the Machine, the Machine feeds two chemicals, typically soap and sanitize. The line exiting the back right of the Machine is for soap. The optional line exiting the back left of the Machine is for sanitizing solution.

If the yellow cover is indented, the chemical is Gravity fed. If the yellow cover is not indented, the chemical is Pump fed.

Cover with Chemical



Note! Gravity fed models, chemical must remain at least 6 in (7.5 cm) above the machine's pump. Place chemical containers in the indentations in the cover or higher.

For gravity fed Machines, place 1-gallon (3.8 liter) chemical containers in the cover indentation(s), and fully insert the respective poly-tubing lines.

For pump fed Machines, place 5-gallon (18.9 liter) chemical containers either on the Wall Bracket tray or on the floor below the Wall Bracket, and fully insert the respective poly-tubing lines.

High Pressure Spray Hose

Attach a quick disconnect (QD) socket at one end of the supplied high pressure Hose to the QD plug on the front of the machine. Hang the coils of Hose on the Hose Hanger on the side of the Machine.

Spray Gun

Attach the QD socket from either the other end of the high pressure Hose or from the optional Hose Reel to the QD plug on the Spray Gun. Hang the Spray Gun on the Gun Hook on the Wall Bracket.

High Pressure Spray Hose

Attach a quick disconnect (QD) socket at one end of the supplied high pressure Hose to the QD plug on the front of the machine. Hang the coils of Hose on the Hose Hanger on the side of the Machine.

Spray Gun

Attach the QD socket from either the other end of the high pressure Hose or from the optional Hose Reel to the QD plug on the Spray Gun. Hang the Spray Gun on the Gun Hook on the Wall Bracket.

Start Up Inspection

All remote systems include a Start-up inspection by an authorized Sage Systems Service Agent.

When assembly and install of a Sage Remote System is complete, call the Sage dedicated Technician at (888) 757-3784 to inform him/her of the job. The Technician will dispatch a Sage Service Agent to the job site to inspect the system, and verify its operation. The Service Agent will contact the owner directly to set the appointment time.

The Service Agent will inspect the entire installation, and inform the owner of any installation or damage issues not related to warranty. The Service Agent on the spot will repair any warranty issues that may surface.

Sage Systems authorized Service Agents can offer monthly maintenance and upkeep of a Sage System, including routine and scheduled maintenance, as well as chemical selection and replenishment. Make sure to ask the Sage Service Agent any service based questions.

Demonstration

The Sage Representative in the installed territory will perform a system demonstration for the manager and employees on a convenient date after successful start-up inspection.

Upon receipt of a successful start-up form from the Service Agent, the Technician will alert the Sage Representative to contact the owner directly to set an appointment time for Demonstration. The demonstration can be scheduled for immediately after Start-up. However, if problems are found during the Start-up inspection, Demonstration may need to be cancelled and rescheduled for after the problems are corrected.

The demonstration includes full disclosure of all the operations of the system, basic trouble shooting, and delivery of printed materials.

Operation

Machine Preparation

Warning! Check oil level of pump before operating.

Check the oil level, through the site hole in the front of the machine. The oil level should bisect the red dot on the front of the pump when the Machine is not running. Oil should not be too low or too high. If oil level is too low, add just enough to bisect the red dot. If oil level is too high, see "Oil level has caused pump contamination" in the Troubleshooting section of this manual.

Caution! Before using machine, remove black solid plug from top of the pump, and replace it with red vented plug, shipped in a plastic bag near pump.

Insert soap and/or sanitize polytubing(s) into the chemical container. Gravity fed systems need 1 gallon (3.8 liter) containers placed in indentations in the cover. Pump fed system can use any size container, placed nearby either above or below the Machine.

Caution! Do not operate machine without cover in place

Open the Sill faucet and check for the float tank to fill to about 1" below the overflow line. Once the float tank is full, the unit is now ready to operate.

Caution! To prevent damage to the pump, water must be turned on and the float tank should be properly filled before starting the Machine.

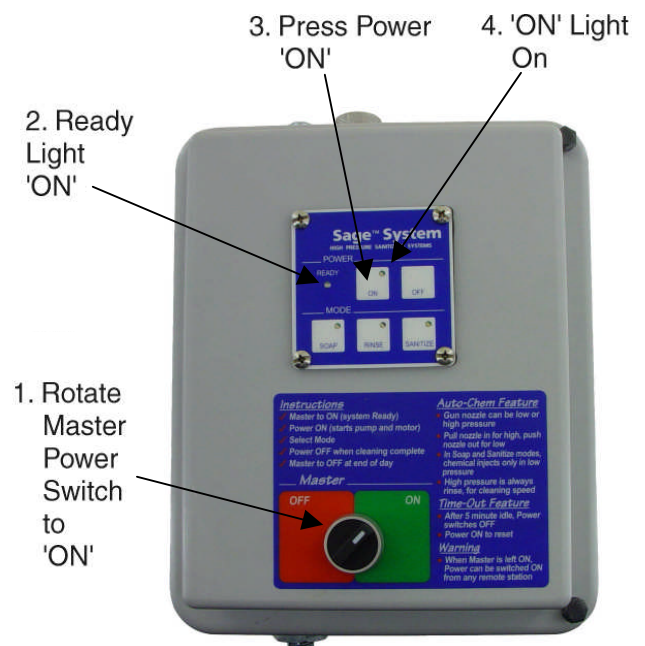
Power Setup and Control

Turn the Master Power switch on the MCP to ON. Think of this switch as the Manager switch. The Master Power switch must be ON to control the machine from the MCP or any remote panel. Some Master Power switches are supplied with a key-lock feature.

Switch panels on the MCP and all Remote Panels are the same, and therefore control the machine and operate the same.

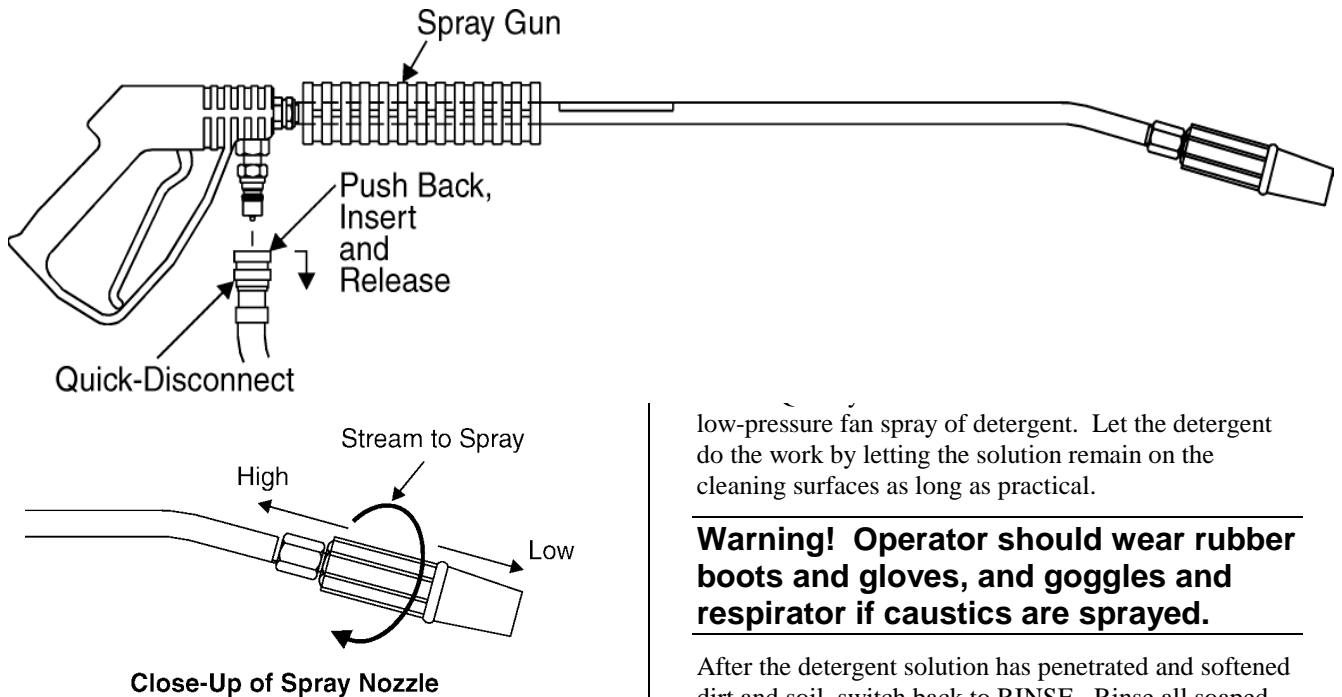
Check the READY light. If on, the Master Power switch is on, and the system is ready to operate. If off, the manager will need to turn the Master Power switch at the MCP to ON.

Check the ON light. If on, the Machine is already running, and may currently be in use at another station. If off, press the ON switch to light the ON led and to start the machine running.



Note! The Sage system should only be used one station at a time, or else suffer drastic pressure loss.

Also, the system can only be in one mode at a time. Multiple stations in simultaneous use will aggravate each other as they change modes.



Hose and Spray Gun Control

Attach the QD socket at one end of the high-pressure hose to the QD plug on the machine front or Remote Panel bottom. Hose Reels are permanently plumbed at installation to the machine or remote panel. Attach the QD socket at the other end to the QD plug on the spray gun supplied with the machine.

Note! Use only Sage System Spray guns with the Sage system to insure proper orifice size and pressure control.

Each standard spray gun has an adjustable nozzle, with variable pressure and spray. Push out on the nozzle to have low pressure. Pull in on the nozzle for high pressure. Turn the nozzle one way to have a sharp stream. Turn the nozzle the other way to have a fan spray.

Panel Operation and Cleaning

Warning! Do not spray electrical outlets or equipment until power is off or susceptible electrical components are covered.

Press the RINSE button to switch to rinse, or all water only, mode. Quickly wet the areas to be cleaned with a low-pressure fan spray of water.

Caution! Make sure that no chemical containers are empty before switching to either "SOAP" or "SANITIZE".

low-pressure fan spray of detergent. Let the detergent do the work by letting the solution remain on the cleaning surfaces as long as practical.

Warning! Operator should wear rubber boots and gloves, and goggles and respirator if caustics are sprayed.

After the detergent solution has penetrated and softened dirt and soil, switch back to RINSE. Rinse all soaped areas using a high-pressure fan spray in slow even motions with the spray nozzle 4 to 6 in (5 to 7.5 cm) above the surface.

Note! User can switch from low pressure SOAP/SANITIZE to high pressure RINSE without walking all the way back to the switch panel. See AutoChem Feature section.

Repeat the low-pressure application and high pressure rinse with the sanitize solution, if desired. If an operator pauses longer than 5 minutes between sprayings, the machine will switch itself OFF to prevent overheating. If this happens, press the ON button to restart the machine. After cleaning is complete, press the OFF button on the switch panel. Machine will remain ready for the next user, but will stop running to conserve energy and prevent damage. Squeegee all floor areas toward the nearest floor drain. After drying, lubricate any moving parts on equipment that was cleaned with the appropriate lubricant.

AutoChem Feature

AuoChem is a standard feature on all machines. This feature allows the operator to switch from low-pressure soap or sanitize to high-pressure rinse without walking all the way back to the Machine or Remote station. Each standard spray gun has an adjustable pressure nozzle. Push out on the nozzle to have low pressure with chemical feed. Pull in on the nozzle for high pressure for rinse only.

AutoChem limits soap and sanitize application to the low-pressure nozzle setting only. This reduces overspray of chemicals, which is safer for the operator and better in sensitive foodservice establishments. With the soap button pressed at the Master Control Panel or Remote Panel, soap will feed only in the low pressure setting. The same is true for sanitize. Neither soap nor sanitize should feed when in high pressure or unloaded (with the trigger released).

Chemical Selection

Warning! Compare any active chemical ingredients against the Cat Pump Chemical Compatibility Chart attached as an appendix to this manual.

Most industrial liquid soap and sanitizers are compatible with the Sage Systems. However, some may cause or accelerate pump damage. Also, when selecting a chemical, the following precautions should be observed.

Note! Avoid detergents that tend to precipitate hard water elements

These accelerate build up in pump and lines. These soaps will create a need for more frequent delimiting than is convenient. Instead, use a detergent that is formulated to hold hard water elements in suspension to keep the inside of the pump and lines maintaining their “as new” appearance.

Note! Use only non-foaming non-detergent sanitizers.

Foaming products should not be fed through the Sage System. Instead, for applications where a foaming chemical is required, use the Sage Systems Foamer Spray Gun assembly. This device mixes the chemical with water at an adjustable rate at the spray gun, isolating the expansion of the foam far downstream from the pump.

Caution! Avoid chlorine-based solutions.

These can produce dangerous fumes when in contact with acid solutions. Chlorine solutions can also attack brass or stainless steel in strong solutions, or unless specially formulated.

Caution! Some concentrated detergents or sanitizers may be toxic.

Follow the directions on the container label in handling and dispensing.

Caution! Avoid breathing the spray mist of chemicals formulated with caustics.

Always wear goggles, boots, gloves, respirator, or any other safety equipment recommended by the chemical manufacturer when handling or dispensing their product through the Sage System.

Note! Sage Systems recommends application of caustic chemical through the optional foamer gun, to reduce fumes and pump damage.

Some of the national manufacturers of detergents and sanitizers are listed below, along with their products. Assistance with selecting the right chemical is available from the Sage Systems authorized Dealer or Service Agent, or from the chemical manufacturer’s local representative. Products from other manufacturers, equally as effective, but not listed herein, may also be used.

Recommended Chemicals

Type of cleaning	Company	Product
General Purpose <i>Cleaning walls, floors, and equipment in food process areas</i>	Auto-Chlor	Neutral MP Cleaner
	BASF	Hazzit Sure Power
	EcoLab	Soilax Liquid S
	Proctor & Gamble	Clean Quick
General Purpose <i>Same as above, but sanitizing agent included</i>	BASF Wyondotte	Render
	EcoLab	Mikro-Quat
Heavy duty cleaning <i>Degreaser with bleaching agent, for blackened or greasy duck boards, cement floors, filters, ranges, hoods, exhaust fans.</i>	Auto-Chlor	Kitchen & Concrete Degreaser Floor Break
	BASF	Interest
	Dubois	Kloro-sprex
	EcoLab	Regain, Trump
Removing stains, lime film, and scale <i>Mild acid detergent for removal of stains or water spots from stainless steel or other kitchen equipment</i>	BASF	Elevate
	Dubois	Orbit
	EcoLab	Lime-a-way

Sanitizing with germicide <i>Non foaming detergent or cleaning agent to sanitize food handling facilities and equipment after washing</i>	<i>Auto-Chlor</i>	<i>Solution QA</i>
	<i>Dubois</i>	<i>D-trol</i>

Chemical Mix Ratio

All Sage Systems machines output a maximum of 2.9 gpm (11.0 lpm). The actual pump output may vary, depending on the power specified and supplied to the machine, and the efficiency of the pump and motor over time. When calculating mix ratios, assume 2.9 gpm (11.0 lpm) total output, most of which is water, and some of which is the fed chemical.

Valve and pump settings are approximate, based on typical installation and feed device manufacturer's specifications. For field verification of a setting, place the chemical feed tube in a measured container or graduated cylinder. Time the feed rate of the chemical. Compare the feed rate to the 2.9 gpm (11.0 lpm) pump output. Adjust the feed rate accordingly to mix the specified volume of chemical with the

Note! Gravity fed models, place chemical containers in the indentations in the cover. Pump fed models, place containers underneath machine, preferably on its tray.

Gravity Fed, Solenoid Valves

The solenoid valve is a white bodied device with a larger green head, and a blue adjustment knob. The blue knob has approximately 11 full turns of adjustment. Tighten the knob (clockwise) to reduce or loosen (counter clockwise) to increase the feed rate. Feed rate will be somewhat dependent on the height of the chemical above the valve, and the level of chemical in the container.

Note! For gravity fed, solenoid valve machines, the chemical must remain at least 6 in (7.5 cm) above the machine's pump.

The following table outlines from fully closed (0 turns) to fully open (11 turns) the equivalent feed ratios and rates for gravity fed Sage Systems. All machines are preset at 3 turns open, or about a 10:1 mix ratio.

Gravity Fed Mix Ratios

Turns Open	Mix Ratio	mL/L	mL/gal	oz/gal
1	30.1:1	33.2	125.6	4.2
2	14.9:1	67.1	254.1	8.6
3	9.8:1	101.8	385.4	13.0
4	7.3:1	137.3	519.7	17.6
5	5.8:1	173.6	657.2	22.2
6	4.7:1	210.8	797.9	27.0
7	4.0:1	248.8	941.9	31.8
8	3.5:1	287.8	1089.3	36.8
9	3.1:1	327.7	1240.4	41.9
10	2.7:1	368.6	1395.1	47.2
11	2.4:1	410.5	1553.7	52.5

Sage Systems Mix Ratios are three times less than the actual ratio, but are equal to the chemical's suggested ratio because less chemical is necessary when applied evenly under pressure than if mixed into standing water, like with a mop and bucket.

Pump Fed, Peristaltic Pump

The peristaltic pump is a blue bodied device with a clear cover, and a white adjustment knob. The white knob has less than one full turn of adjustment, with six dots for reference. Think of the white knob as a clock hand, with straight up being 12 o'clock. Turn the knob clockwise to reduce or counter clockwise to increase the feed rate.

Feed rate is not dependent on the height of the chemical above the pump. The pump is a positive displacement device that feeds a constant rate into the system.

The following table outlines from fully closed (12 o'clock) to fully open (10 o'clock) the equivalent feed ratios and rates for pump fed Sage Remote Systems. All machines are preset at full open, or about a 20:1 mix ratio.

Pump Fed Mix Ratios

<i>Knob Position</i>					
<i>Dot</i>	<i>Time</i>	<i>Mix Ratio</i>	<i>mL/L</i>	<i>mL/gal</i>	<i>oz/gal</i>
	<i>1 o'clock</i>	<i>216:1</i>	<i>4.6</i>	<i>17.6</i>	<i>0.6</i>
<i>O</i>		<i>120:1</i>	<i>8.4</i>	<i>31.6</i>	<i>1.1</i>
	<i>2 o'clock</i>	<i>108:1</i>	<i>9.3</i>	<i>35.2</i>	<i>1.2</i>
<i>O</i>	<i>3 o'clock</i>	<i>72:1</i>	<i>13.9</i>	<i>52.8</i>	<i>1.8</i>
	<i>4 o'clock</i>	<i>54:1</i>	<i>18.6</i>	<i>70.4</i>	<i>2.4</i>
<i>O</i>		<i>51:1</i>	<i>19.5</i>	<i>74.0</i>	<i>2.5</i>
	<i>5 o'clock</i>	<i>43:1</i>	<i>23.3</i>	<i>88.1</i>	<i>3.0</i>
<i>O</i>		<i>40:1</i>	<i>25.2</i>	<i>95.2</i>	<i>3.2</i>
	<i>6 o'clock</i>	<i>36:1</i>	<i>28.0</i>	<i>105.9</i>	<i>3.6</i>
<i>O</i>		<i>32:1</i>	<i>30.8</i>	<i>116.5</i>	<i>3.9</i>
	<i>7 o'clock</i>	<i>31:1</i>	<i>32.7</i>	<i>123.6</i>	<i>4.2</i>
<i>O</i>		<i>27:1</i>	<i>36.4</i>	<i>137.8</i>	<i>4.7</i>
	<i>8 o'clock</i>	<i>27:1</i>	<i>37.4</i>	<i>141.4</i>	<i>4.8</i>
	<i>9 o'clock</i>	<i>24:1</i>	<i>42.1</i>	<i>159.2</i>	<i>5.4</i>
	<i>10 o'clock</i>	<i>21:1</i>	<i>46.8</i>	<i>177.1</i>	<i>6.0</i>

Sage Systems Mix Ratios are five times less than the actual ratio, but are equal to the chemical's suggested ratio because less chemical is necessary when applied evenly under pressure than if mixed into standing water, like with a mop and bucket.



Troubleshooting Problems

Nothing happens when Machine is switched on

- GFCI may need to be reset
- Motor needs to be reset
- Motor is not operating

Machine starts but immediately stops

- Power supply is inadequate

Machine starts with low pressure

- Machine is starved for water
- Pressure is leaking out of system
- Adjustable nozzle issues
- Lime build up is hampering the pump
- Unloader valve needs adjustment
- Pump may need rebuilding

Machine starts with high pressure, but then the pressure drops

- Air is entering the system
- Machine is starved for water

Machine is loud, shuddering, or vibrating and not producing pressure

- Machine is starved for water
- Air is entering the system
- Temperature relief valve is discharging
- Unloader valve needs adjustment

Machine is not dispensing soap or sanitizing agent

- Chemical containers are empty
- Chemical is too thick or viscous
- Solenoid(s) do not have gravity assist
- Chemical feed tubing is cracked or leaking
- Pressure switch for AutoChem feature needs adjusting
- Chemical feed devices are not functioning properly

Machine is constantly dispensing soap or sanitizing agent

- Pressure switch for AutoChem feature needs adjusting

Machine will only dispense soap or sanitize in low pressure nozzle setting

This is normal. It's called the AutoChem feature, and has some distinct advantages. Please see the Operation section titled AutoChem feature, or the Troubleshooting Solutions section titled...

- Pressure switch for AutoChem feature needs adjusting

Troubleshooting Solutions

GFCI may need to be reset

Depress the Reset button on the GFCI and release. Make sure to verify that the supply power is adequate, on a dedicated line with a 20 amp circuit breaker.

Chemical is too thick or viscous

Thick, dense, or viscous chemicals may have difficulty flowing through the small diameter poly-tubing. The same chemical may need to be diluted, or may even be available in a thinner form from the supplier. Try running colored water in place of the chemical. If the water draw and mixes with the high pressure spray, your standard chemical may be too thick.

Power supply is inadequate

Remote Systems require one dedicated 20 amp appliance circuit for 115 Volt 60 Hertz, or one dedicated 10 amp appliance circuit for either the 230 Volt 50 Hertz or 230 Volt 60 Hertz systems. Check for the capacity of the circuit or for any other loads on the dedicated line.

Pressure is leaking out of system

Isolate the Machine from the Remote Tubing network by disconnecting the Manifold from the Machine, and replacing with a plug. Determine whether there may be a leak in the Machine itself. If not, there may be a leak in the Remote Tubing network. Inspect all fittings and hoses in the targeted section of the system for leaks. Tighten or replace if necessary any leaking hoses or fittings.

Adjustable nozzle issues

Check the push/pull adjustable nozzle for its position. Pushed out is the low pressure position. Pulled in is the high pressure position. Inspect the high pressure spray pattern. If the pattern appears inconsistent, the nozzle may be worn and may need replacing.

Lime build up is hampering the pump

Check for lime build-up on visible fittings in the float tank. Lime build-up may cause the pump to fail. If deliming of the machine was last done over one month ago, use the Sage Systems Deliming assembly and a deliming solution to delime the Machine.

Unloader valve needs adjustment

Call the dedicated Sage Technician at (888) 757-3784 for assistance in adjusting the unloader valve, or see the Service section of this manual. Please note, special tools are required for proper Unloader valve adjustment. Sage Systems suggests that only authorized Service Agents set or adjust Unloader Valves.

Motor needs to be reset

If the unloader valve is adjusted improperly, the machine may operate at too high a pressure, or may work inefficiently, causing the Machine to draw too many amps for the line. This can create an overload of the motor, which has built in overload protection. The reset button is on the back end of the motor. Make sure to adjust the unloader valve to correct this problem permanently.

Motor is not operating

Very rarely are motors worn out to the point of necessary replacement. Any service on a motor is handled through the local authorized Leeson service agent in your area. Refer to the Leeson service guide for a listing.

Machine is starved for water

Starving the pump for water will cause serious damage to the pump. Check that the water supply is open, and the float tank is filling with water.

Verify that the water supply to the float tank is 4.0 gpm (15 lpm) and 30 psi (2 bar) minimum. If the float tank does not remain sufficiently full to cover the float tank outlet port while the machine is running, the inlet water flow or pressure is insufficient.

Observe the water level in the float tank with the Machine on and Spray Gun spraying. The water level should never drain down to the outlet fitting that leads into the Machine. If the water level does drop and does not refill, adjust the float arm for shut off about 1" (2.5 cm) below the overflow rim.

Check for kinks or leaks in the water supply hose. Inspect the two filter screens, and clean or replace if necessary. The first is in the supply hose at the float tank. The second is in the in-line water filter inside the Machine, just after the tank feeds through the Machine wall.

Pump may need rebuilding

These direct drive pumps can often run smoothly for 5 years, given proper regular maintenance and care. However, worn piston cups, seals, and o-rings can cause a lack of pressure in the pump. Three different pump repair kits are available for pump refurbishment, the Seal kit, Valve kit, and Inlet valve kit. The pump should not ever need to be completely replaced, unless there is significant damage or a crack in the pump housing.

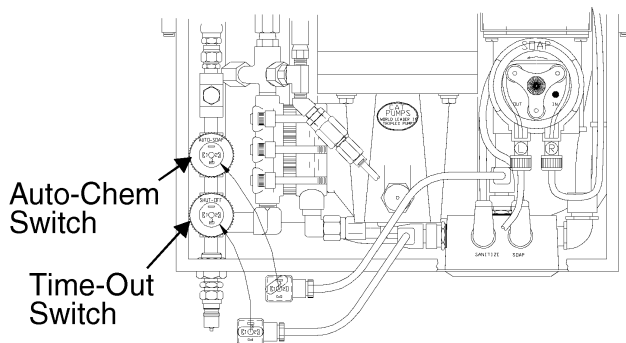
Pressure switch for AutoChem feature needs adjusting

The rear pressure switch controls the AutoChem feature. At the factory, the rear switch is wired terminals 1-3, allowing chemical flow at pressures below the set point, and stopping chemical flow at pressures above the set point.

If the machine is not dispensing chemical in low-pressure with the soap or sanitize buttons pressed, the pressure switch wiring may have failed, or the switch itself may have failed. Remove the connector from the top of the switch and inspect the connections.

If the machine is constantly dispensing chemicals, the pressure switch may have become unadjusted or failed. Turn the upper half of the switch counter-clockwise to decrease the switch point to fall between the high and low pressures. The feed should work in low pressure, and stop in high pressure for AutoChem to work properly. The switch can be set to allow chemical feed in both low and high pressures.

For soap and sanitize to work in low and high pressure, turn the upper half of the switch clockwise to increase the kickover point above the high pressure, but less than the unloaded pressure. The feed should work in low pressure and high pressure, but stop when unloaded into bypass mode. However, the setting should never allow chemical feed when the trigger is released and the pressure rises as the machine unloads into bypass mode.



Air is entering the system

Start the Machine and spray the Spray Gun in RINSE mode. If the problem persists, see the preceding section, Machine is starved for water. If the problem only occurs in SOAP or SANITIZE modes, read the following suggestions.

Verify that the chemical containers are not empty and drawing air into the chemical feed devices.

Check that the chemical is moving through the tubing. If not, check the tubing for leaks or cracks.

Chemical containers are empty

Verify that the chemical containers are not empty and drawing air into the chemical feed devices.

Temperature relief valve is discharging.

If the water temperature exceeds 165oF (74oC), the temperature relief valve will discharge recirculated water, and draw in fresh cooler water from the float tank.

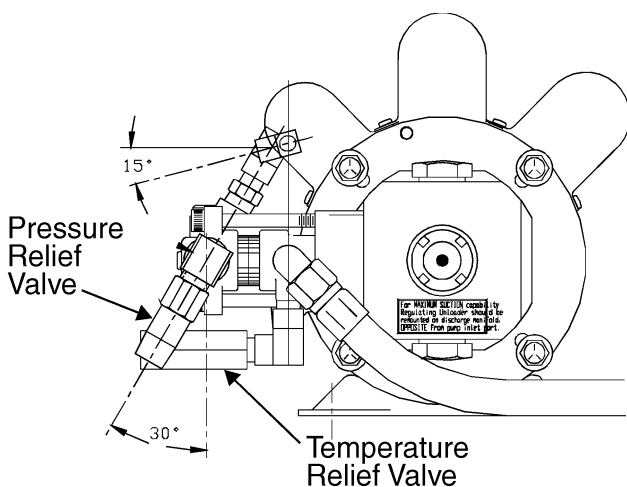
However, if the supply water from the float tank is too hot, the pump can be severely damaged.

Solenoid(s) do not have gravity assist

For gravity fed systems (those with solenoid valves), verify that the lowest point of the chemical container(s) is at least 6 in (15 cm) above the solenoid valve.

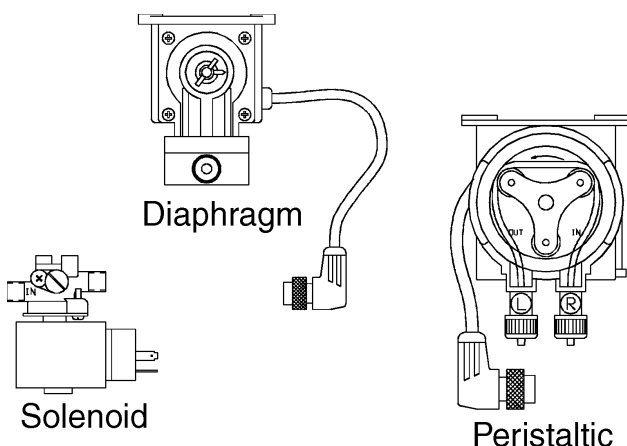
Chemical feed tubing is cracked or leaking.

If chemical is not flowing through the line, inspect the clear feed tubing for leaks or cracks.



Chemical feed devices are not functioning properly

Switch the Machine to ON and into the Soap or Sanitize position, whichever is in question. Switch the Spray Gun nozzle to low pressure (pushed out) to activate the AutoChem feature.



Solenoid valves

Remove the suspect valve's tubing from the check valve fitting by pushing in on the fitting ring while pulling on the tube. With a pipet bulb or other suction

device, apply suction to the tubing. If suction is held, the valve is closed and functioning properly. Begin spraying. Now apply suction again. If suction is created, the valve is open and functioning properly. If suction is held, the solenoid valve is not open, and needs replacing.

Peristaltic Pumps

Begin spraying. If the pump does not turn, repair or replace the pump. If the pump turns, but does not move chemical through the tubing, there is a leak before, in, or after the pump. Remove and check the tubing before and after the pump. Draw suction with a pipet bulb or other suction device at one end while sealing off the other end with a finger. If necessary, remove the tubing and ends from inside the pump, and check with suction. Replace any leaking tubings.

Diaphragm Pumps

Begin spraying. If the adjustment knob area is not visibly nutating, disconnect the pump from the plug connection, and install a temporary replacement. If the replacement works, remove the old and finish installing the new.

If the knob area nutates, but the chemical in the tubing appears to sway back and forth without flowing, then inspect the check valve instead.

Quick Disconnect is not seated properly

Start the machine. Disconnect all Hoses with Quick Disconnect sockets from the QD plugs on the machine or remote panel. All QD plugs should not leak when the system is pressurized. One at a time, engage the QD socket to each plug by pulling back on the socket ring, pressing completely onto the plug, and releasing the ring. The ring should return to flush with the top of the socket, and a pull should not disconnect the two. Also the union should not leak when pressurized. If connection is not possible or secure, or if there is a leak before or after connection, replace first the plug, and retest. Then, replace the socket and retest.

Maintenance

Every Month

Inspect all fittings and hoses for leaks. Tighten or replace if necessary any leaking hoses or fittings. Inspect the float tank. The float valve should open as the water level drops and before the float bottoms in the tank. The float valve should close before the water level fills to the overflow rim. Adjust the float arm at the valve to insure operation as described. Inspect the two filter screens, and clean or replace if necessary. The first is in the supply hose at the float tank. The second is in the in-line water filter inside the Machine, just after the tank feeds through the Machine wall.

Deliming the Machine

Remove the cover from the float tank. Shut off the water supply at the sill faucet. Run the machine and spray until the water is drained from the float tank.

Warning! Do not run the Machine dry.

Shut off the Machine as soon as the water level in the float tank reaches the outlet fitting that leads into the Machine.

Fill the float tank with a de-liming solution.

Attach the QD socket of the T&S de-liming assembly to the QD plug on the front of the Machine. Put the wand end of the de-liming assembly into the float tank. Start the Machine, and leave it running 15 to 20 minutes.

Near the end of this period, with the Machine still running, disconnect and reconnect the QD socket from the plug at the front of the Machine 6 to 8 times. This will activate the bypass unloader valve, and will delime its functioning parts.

Without a Sage de-liming assembly

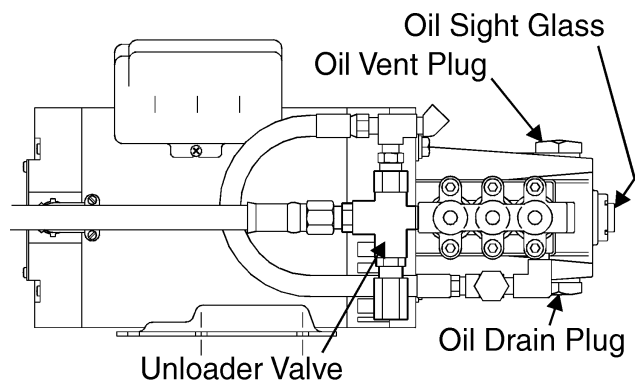
A high-pressure hose and spray gun can substitute for the Sage System de-liming assembly. Remove the nozzle from the end of the spray gun. Attach the QD socket on the high-pressure hose to the QD plug on the front of the Machine and the Spray gun. Insert the open tip of the wand into the float tank. Follow the standard de-liming instructions with this assembly.

This process also delimes the Spray Gun, fittings, and nozzle.

Every Three Months

Perform all maintenance items suggested for every month.

Changing oil



Switch the Machine to OFF at the Master Control Panel. Flip the dedicated Machine breaker switch to off. Remove the yellow cover from the machine, and remove the oil fill plug on the top of the pump head, inside the machine. Locate the oil drain plug underneath the Machine on the pump head directly below the oil sight gauge. Remove the drain plug and drain the oil into approved recycling container. Replace the drain plug. Fill the pump through the fill-plug hole until the oil level lines through the red dot on the oil sight gauge. The pump will take approximately 1-1/4 pints (600 ml). Use only Sage Systems pump oil, Cat Pump oil for 2SF pumps, or any ISO VG68 oil. Replace the oil fill plug and Machine cover.

Every Six Months

Perform all maintenance items suggested for every month and every three months.

Inspect all QD plugs at the Machine and at Remote Panels for excessive wear. Replace if dented or damaged.

Every Twelve Months

Perform all maintenance items suggested for every month, every three months, and every six months.

Rebuild the high-pressure pump with a Valve Kit (534052-45) and a Seal Kit (534053-45).

Rebuild the high pressure pump with a Valve Kit (534052-45) and a Seal Kit (534053-45).

Rebuild the bypass unloader valve with an Unloader Rebuild Kit (537353-45).

Service

Dedicated Sage Technician

Sage Systems has established a dedicated Sage Service Technician. Our Technician verifies warranty claims, offers technical support, and connects users with Sage Systems authorized service agencies in their area.

Authorized Service Agents

Sage Systems has gathered a full network of CFESA or NAFEM service agencies across the country. These professionals are experienced food equipment repair personnel. They inspect every new remote system installation at Start-up, and can offer regular maintenance or service on demand. To obtain a list of Sage Systems authorized service agents in your area, call our dedicated Sage Technician at (888) 757-3784.

Helpful Service Tips

A complete understanding of the interrelation of all the components of a Sage System is essential before any adjustments or repairs are attempted. Please make sure to read the entire manual before proceeding with service issues.

The Troubleshooting section includes many helpful tips and suggestions to overcome common problems with Sage machines. Make sure to check this section for some ideas that may not be repeated in this Service section.

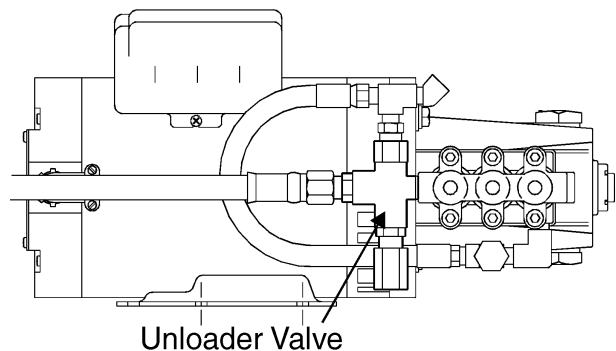
High Pressure Pump(s)

The high-pressure pump is a positive displacement, direct drive design. The pump is mounted to the front of the motor with four bolts for easy maintenance.

The pump rotations per minute (rpm) must be maintained at the fixed design rate in order to produce the optimal flow rate without variation. Typically, all T&S Sage machines are set to output between 2.75 and 2.95 gallons per minute, gpm (10.4 and 11.2 liters per minute, lpm)

The pump is supplied fresh water from the float tank at the rear of the machine. The tank cover removes for inspection of the valve inside. The float valve is adjustable, and should be set so that the highest water level is 1 in (2.5 cm) below the over level of the tank. The 1 in (2.5 cm) gap between the tank and cover serve as a back-siphon and back-pressure prevention device. The pump draws water from the float tank with suction. Water is pulled through an in-line water filter, down the pump inlet hose, and to the water inlet manifold of the pump. The inline water filter should be opened and the screen cleaned every month to prevent water starvation of the pump.

Bypass Unloader Valve



The Bypass Unloader Valve is attached to the pump's high pressure outlet side, and allows the pumped fluid to recirculate back to the pump inlet whenever the Spray Gun trigger is released. This valve, rather than the pump, can often be responsible for causing a drop in pressure, drop in water flow, or a binding of the pump. Be aware that down stream restrictions in the outlet line may increase pressures above the unloading valve setting. The unloader valve may need readjustment if new hoses, lines, or spray nozzles are added after the machines first installation.

When an unloader valve is not seating properly, some of the pump output will recirculate, even when spraying, causing a reduced volume and reduced pressure at the nozzle.

An unloader valve that sticks open causes a complete loss of pressure although the pump and motor are running normally.

An unloader valve that sticks in the closed position can cause severe pump damage when the spray gun is released and the excess pressure has no release. As a safety feature, all Sage machines include a Pressure Relief valve opposite the Bypass Unloader valve, which will discharge when the pressure exceeds the machine maximum by 25%.

Setting the Unloader Valve

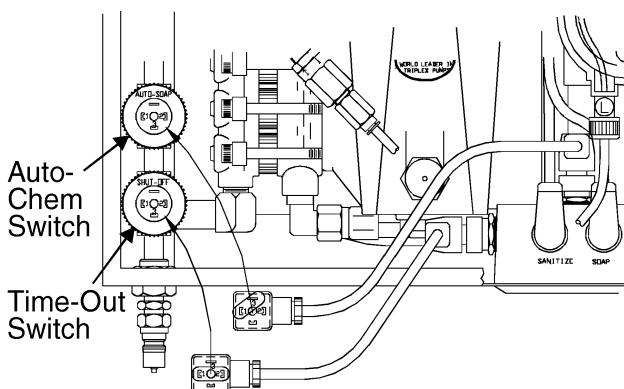
To reset the Bypass Unloader valve, you will need a 0-2000 psi pressure gauge with a 1/4" (.64 cm) QD socket inlet and a QD plug outlet, and a crescent wrench. Install the pressure gauge assembly to the plug on the front of the machine. Install the high-pressure spray hose and spray gun to the outlet of the gauge assembly. Start the machine and spray through the spray gun with the nozzle pulled in to the high-pressure position. Loosen the hex knob on the unloader valve down until the pressure is at least 100 psi (6.9 bar) below the maximum rated pressure for the machine, either 600, 800, or 1000 psi (41, 55, or 69 bar). Then tighten the hex knob on the unloader until the pressure reaches its maximum just below the maximum rated pressure. You should not be able to drive the pressure above the rated maximum, but should be able to get within 50 psi (3.5 bar) of the maximum rating.

The normal bypass pressure is within 200 psi (1.4 bar) of the unloader setting. In other words, the unloader valve will open and allow the water to bypass into recirculating mode when the spray gun is released, and the pressure goes up at least 200 psi (1.4 bar) beyond the set pressure.

Note! It is essential that the correct nozzle for the machine be installed to all spray guns on the system.

A different orifice size can greatly affect flow rate, maximum pressure, and even amperage. Each nozzle is specified for each machine to optimize flow rate at the specified pressure, while minimizing amperage. Using a different nozzle than is originally specified may cause severe machine damage, and will void warranty.

Pressure Switches



The rear pressure switch controls the AutoChem feature. At the factory, the rear switch is wired terminals 1-3, allowing chemical flow at pressures below the set point, and stopping chemical flow at pressures above the set point.

The chemical feed should work in low pressure, and stop in high pressure if the AutoChem feature is working properly. This switch is set between the high and low pressures produced by pulling in or pushing out on the spray nozzle. When the pressure drops to low, the switch signals to open the solenoid valve to start the pump, to allow chemicals to flow.

The switch can be set to allow chemical feed in both low and high pressures. For soap and sanitize to work in low and high pressure, turn the upper half of the switch clockwise to increase the kick-over point above the high pressure, but less than the unloaded pressure. The feed should work in low pressure and high pressure, but stop when unloaded into bypass mode.

Warning! The AutoChem switch setting should never allow chemical feed when the trigger is released and the pressure rises as the machine unloads into bypass mode.

The front pressure switch controls the Time-out function for idling machines. When the Machine runs in unloaded recirculating mode, the second pressure signals to reset a clock in the Master Control Panel called the Time Delay feature. This clock counts how long the machine stays in bypass mode. If the Machine runs in bypass mode for 5 minutes, the TDF shuts off the Machine. Press the green ON switch to restart the machine.

The Time-out switch is wired 1-2. When the pressure rises above the set point, the circuit resets the clock in the Time Delay feature in the MCP. This switch is set between the maximum rated pressure and the unloaded pressure. When the spray gun is released and the pressure rises, the unloader valve opens to begin recirculation, and the switch changes to trigger the Time Delay feature to start counting.

Both switches are adjusted the same. Loosening or turning counter clockwise the top half of the switch reduces the set point pressure. Tightening or turning clock-wise the top half of the switch increases the set point pressure.

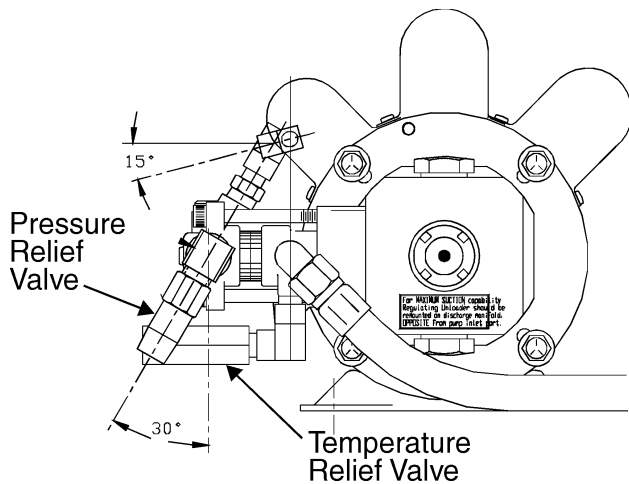
Time Delay Feature

Continuous running of the machine with the spray gun released will create an increase in temperature in the recirculating water.

When the Machine runs in unloaded recirculating mode, the second pressure resets a clock in the Master Control Panel called the Time Delay Feature (TDF). This feature counts how long the machine stays in bypass mode. If the Machine runs in bypass mode for 5 minutes, the MCP shuts off the Machine. Press the green ON switch to restart the machine.

The TDF is a pre-set and non-adjustable timing mechanism. When energized, it begins its timing phase, which lasts approximately five (5) minutes. After five (5) minutes, the TDR interrupts the power to the coil of the motor relay.

The front Pressure Switch engages the TDF. When the machine is operating at or below the maximum rated pressure, the clock is not counting. When the Machine unloads into bypass (recirculating) mode, the pressure rises about 200 psi (13.8 bar) above the maximum rated discharge pressure. The Pressure Switch senses this rise, and signals for the MCP to start the timing. When the Spray Gun trigger is pulled, the pressure drops back to or below the maximum rated discharge pressure, and the pressure signals to the MCP to reset the timing.



Temperature Relief Valve

If the temperature reaches 165°F (74°C), the Temperature relief valve will discharge 3.4 oz (100 ml) of heated water from the recirculating loop, and replace it with cooler water from the float tank. This will repeat every time the recirculating water reaches 165°F (74°C).

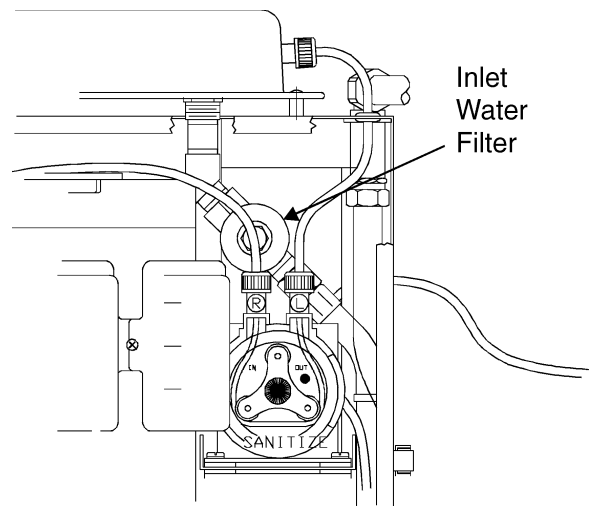
Pressure Relief Valve

The Pressure Relief Valve is set at the factory to 25% above the maximum rated pressure. Its purpose is to guarantee that the high-pressure side of the pump never sees a pressure more than 25% above the maximum rated pressure. This condition could only occur if certain components, like the unloader valve, failed or were altered from their factory state.

The PRV discharges water if the discharge pressure exceeds its set pressure. If you suspect that the PRV is the source of a problem, check its setting. With a pressure gauge mounted to the front of the machine, and the Spray Gun spraying in high pressure, verify the pressure is within 50 psi of the maximum rated pressure. Make sure the PRV is not leaking in this condition. If not, loosen until the leaking begins and the pressure begins to fall. Then tighten 2 full turns past the leak point to reseal the PRV and to set it at 25% above the maximum rated pressure. If the PRV leaks constantly, maximum efficiency will be impossible to obtain, and the PRV should be replaced and set as described above.

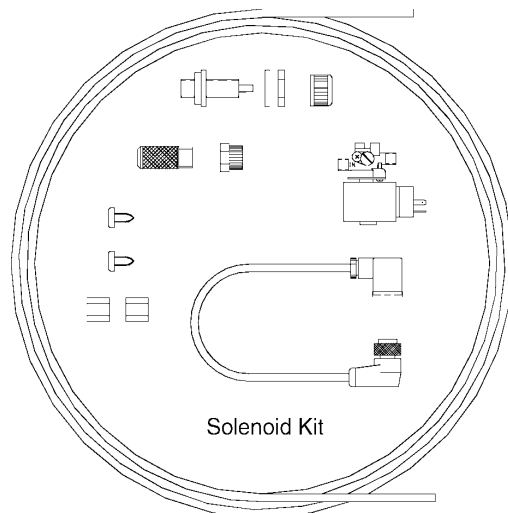
In-line Water Filter

This filter is designed to limit the debris that can enter the pump from the inlet water supply or the float tank. Regular service should include simply replacing the o-ring and filter screen by removing the big bottom cap with the hex nut feature, cleaning or replacing the two components, and reseating the cap.



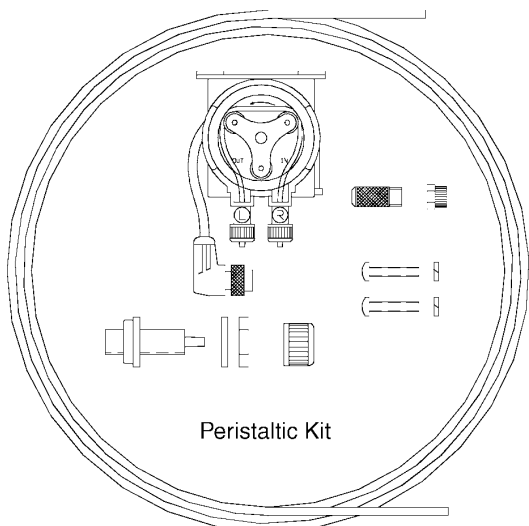
Chemical Feed Devices

Gravity fed systems, Solenoid Valves



The solenoid valves used with Sage systems are not repairable. If in troubleshooting it is determined that a solenoid valve is malfunctioning, the entire valve should be replaced using one of the Kits provided by Sage Systems.

Pump fed systems, Peristaltic pumps



The peristaltic pump(s) pull chemical from their containers with a tripod arrangement of rollers compressing surgical tubing and rolling along the tubing. This creates a suction, and forces chemical into the water lines that feeds the pump. There are two typical Peristaltic pump repair operations. First, you may need to replace the inner tubing. Or, you may need to replace the entire pump.

Replacing the Tubing

First, turn the speed control to OFF. Unscrew the nuts attaching the polytubing to the pump, and pull the polytubing from the white fittings.

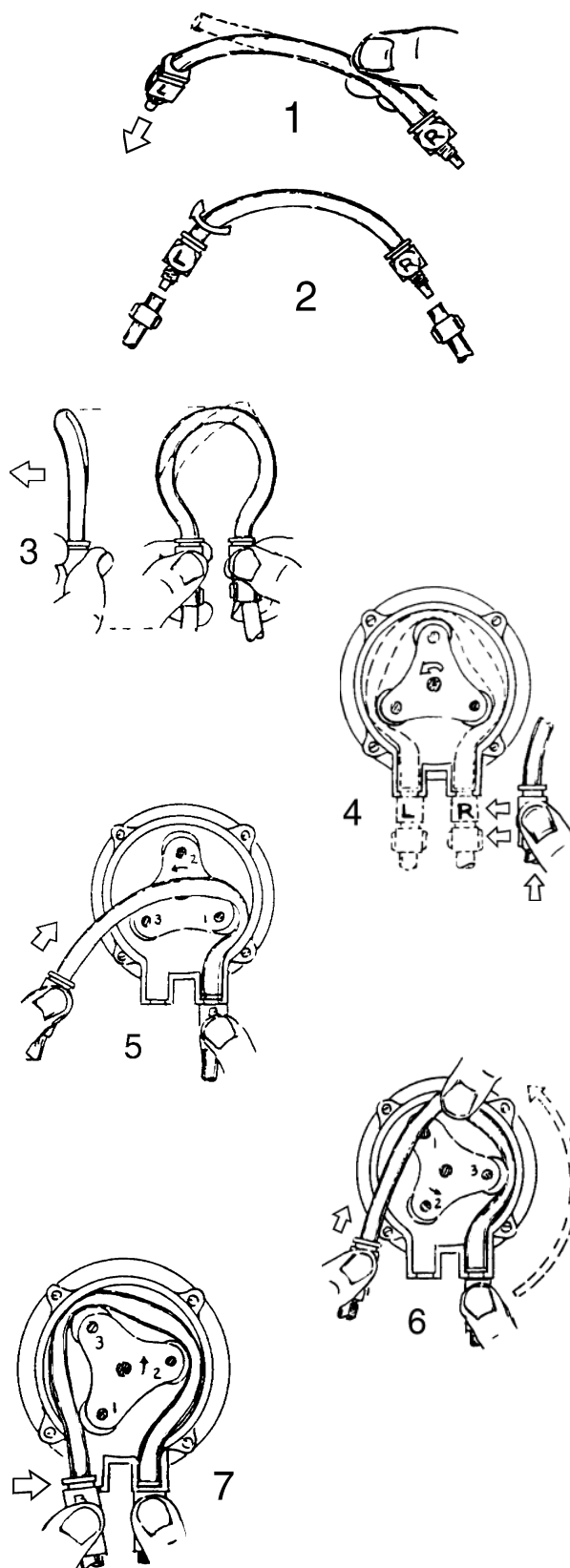
Pull off the red retaining knob from the motor shaft, and remove the clear cover. Lift out the tubing and fitting assembly. Be careful not to come in contact with any non-diluted chemicals in the tubing or pump assembly. You may turn the pump rollers by hand to assist with removing the tube.

Wipe clean the pump head area, and if necessary, clean with a mild soap solution, and rinse with clean water. Lubricate the shaft and rollers with one of the two approved lubricants, either Union Carbide L-45 Dimethylolpolyoxane or GE SF96-100 silicone fluid.

Note! The replacement tube is not symmetrical.

Position the rollers so that there is space between the first roller and the right side wall. Hold one end of the replacement tubing with fittings in your right hand, with the BW on the fitting facing you. The other end should turn down and to the left. If not, you are holding the wrong end. This twist is essential to allow for the difference of inside and outside length when the tube is threaded into the pump.

Replacing the Tubing



Hold the right fitting in the right hand, and left in the left, in a loop with thumbs on the BW letters. The looped tube should bend away from you. To thread in the tube, insert the right side fitting firmly and all the way into the right lock socket. Feed the tubing between one roller at a time, turning the rollers as necessary to help feed the tubing between the roller and the wall. Keep the BW in the left hand facing up, without twisting the tubing to do so. Use the right thumb to assist with pressing the tubing down between the roller and the wall.

Caution! Be careful to avoid pinching fingers in he turning rollers.

After the tubing is in place at all three rollers, press the left fitting into its place. Replace the cover and rotating knob. Cut about 0.25 in (0.2 cm) from the end of the inlet and outlet polytubing, making sure to keep the nut up the tubing while cutting. Press the freshly cut inlet and outlet tubing onto the pump fittings, and tighten the nuts over the connections. Reset the control knob to its previous position for the same feed rate as before.

Replacing the Pump

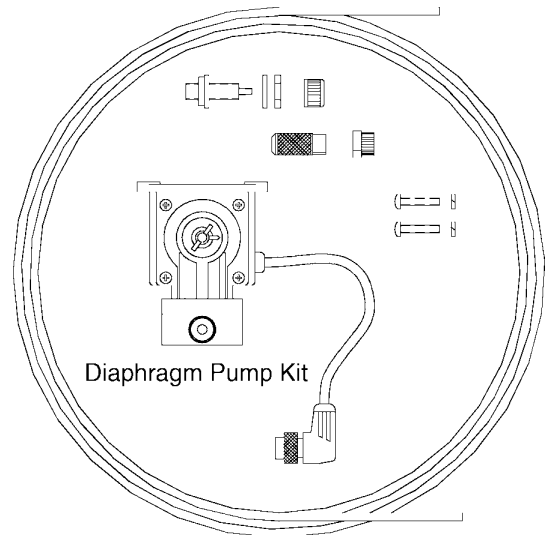
Turn the Machine and Master Power off at the MCP. Disconnect the inlet and outlet polytubing. Disconnect the yellow electrical fitting from the wiring box in the machine.

Unscrew the two screws that hold the pump to the welded vertical bracket inside the machine. Remove the pump.

Insert the new pump, and attach to the bracket with the two screws. Attach the ¼ turn electrical connector of the new pump to the same port where the previous plug was attached.

Cut about 0.25 in (0.2 cm) from the end of the inlet and outlet polytubing, making sure to keep the nut up the tubing while cutting. Press the freshly cut inlet and outlet tubing onto the pump fittings, and tighten the nuts over the connections.

Pump fed systems, Diaphragm pumps



The diaphragm pump(s) pump chemical from their containers with an oscillating diaphragm that forces chemical into the water lines that feeds the pump. Diaphragm pumps are not repairable and must be replaced as a unit if found to be defective. Sage Systems offers kits complete with all items necessary to replace Diaphragm pumps.