

Operations Manual



**OIL FIRED
WATER
HEATER**

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Safety, Installation & Operation

Unpacking & Safety

Machine Unpacking

All cleaners are carefully inspected and cartoned to protect against shipping damage. If there is damage or missing parts, the transportation company agent should make a notation to that effect on the bill. Refer to the parts list in this manual and advise what parts are missing or damaged. If available, give the invoice number on all order bills. This procedure will enable needed parts to be shipped quickly.

Thank you for choosing our product.



READ ALL Installation, Operation, and Maintenance instructions before operating the machine.

NOTE: Record model number and serial number and date of purchase.

IMPORTANT SAFETY INSTRUCTIONS

The safety alert symbol. This symbol is used to identify safety information about hazards that can result in personal injury.

A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to indicate the likelihood and the potential severity of injury. In addition, a hazard symbol may be used to represent the type of hazard

This portion may be the most important in your manual. It is our desire that you have many years of satisfactory use, with no injuries to the operator, maintenance personnel, customers or onlookers. If the operator uses good safety practices, the likelihood of injuries will be minimal.



DANGER indicates a hazard which, if not avoided, will result in death or serious injury.



WARNING indicates a hazard which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazard which, if not avoided, might result in minor or moderate injury.

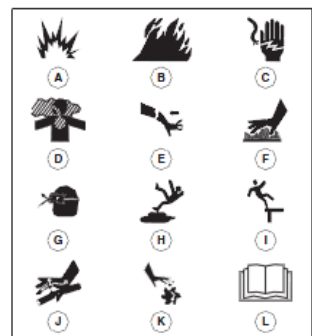


CAUTION, when used without the alert symbol, indicates a situation that could result in damage to the equipment

Read and understand this “OPERATOR’S MANUAL” and “LABELS ON THE MACHINE” before starting.

- A - Explosion
- B - Fire
- C - Electric Shock
- D - Toxic Fumes
- E - Kickback
- F - Hot Surface
- G - Flying Objects

- H - Slippery Surface
- I - Fall
- J - Fluid Injection
- K - Moving Parts
- L - Read Manual



Safety(continued)

This portion may be the most important in your manual. It is our desire at Steam Way International that you have many years of satisfactory use, with no injuries to the operator, maintenance personnel, customers or onlookers. If the operator uses good safety practices, the likelihood of injuries will be minimal.

General Safety

1. Before operating this machine, read and observe all safety, unpacking, and operating instructions. Failure to comply with these instructions could create a hazardous situation.
2. The operator of this equipment should not operate this equipment when fatigued or under influence of alcohol or drugs.
3. The operator of this equipment should be thoroughly familiar with its operation and trained in the job to be accomplished.
4. The operator of this equipment should wear protective face shields and other protective clothing as required for safe operations.
5. Do not leave this machine unattended when it is operating.
6. All installations must conform to all applicable local codes. Contact your electrician, plumber, utility company or seller for details.
7. Follow instructions on how to stop the machine and bleed pressures quickly. Be thoroughly familiar with the controls.
8. Do not operate the machine if any mechanical failure is noted or suspected.
9. When starting a job, survey the area for possible hazards and correct before proceeding.
10. Keep all protective covers and shields in place. Replace all protective covers and shields after adjustments are made to prevent accidental contact with hazardous parts.
11. If a water or fuel leak is found, **DO NOT OPERATE THE MACHINE**. Shut off and repair.
12. Inspect machine for damaged or worn components and repair or replace to avoid potential hazards. Do not operate the machine if any mechanical failure is noted or suspected.
13. During normal operation of this machine, HOT discharges and surfaces may be produced.
14. If chemicals are used in conjunction with this equipment, read and follow the product label directions.
15. Always shut down machine before refueling.
16. Do not overfill the fuel tank. If any spillage occurs, clean up immediately and/or neutralize the spill before attempting to operate the machine.
17. Do not start the burner unless a full flow of water is coming from the wand. Air leaks or insufficient water to the machine means less than full flow of water through the coil. This could cause hose failure and burns to the operator.
18. Always point the gun assembly in a safe direction away from people and do not direct spray on the cleaner.

WARNING: ELECTRICAL SHOCK HAZARD

ADVERTENCIA: LE DANGER ELECTRIQUE DE CHOC

AVERTISSEMENT: CHOQUE ELÉCTRICO PELIGRO



Electrical, Mechanical, Fuel Safety

Electrical Safety

1. This machine must be electrically grounded. Failure to have the machine grounded may result in the operator being electrically shocked and even death.
2. Fuses or circuit breakers should be compatible with machine requirements.
3. If an extension cord must be used to operate this machine, it should be as short as possible. The extension cord must be properly sized and fitted with a grounding type plug and receptacle.
4. Do not plug-in or un-plug machine with wet hands.
5. Keep power cords and connections (connectors) out of water.
6. All wiring and electrical connections should comply with the National Electrical Code (NEC) and with local codes and practices.
7. High voltage may be present within this machine. Servicing should only be performed by properly trained personnel.

Mechanical Safety

1. All guards, shields, and covers must be replaced after adjustments are made to prevent accidental contact with hazardous parts.
2. Inspect machine for damaged or worn components and repair or replace to avoid potential hazards. Do not operate the machine if any mechanical failure is noted or suspected. Drive belts if so equipped must be inspected and tightened.
3. Always use spray tip or steam impact nozzle specified in the machine specifications.

Fuel Safety

WARNING: OPEN FLAME. Do not operate this machine in an area with combustible materials. A suitable fire extinguisher should be available in operating area.

ADVERTENCIA: Ne pas fonctionner cette machine dans un secteur avec les matériels combustibles. Un extincteur d'incendie convenable doit être disponible dans l'opération de secteur.

AVERTISSEMENT: LLAMAABIERTA. No funcione esta máquina en un área con los materiales

combustibles. Un extintor conveniente debe estar disponible en área de funcionamiento.



WARNING: DO NOT USE GASOLINE, CRANKCASE DRAININGS, OR OIL CONTAINING GASOLINE OR SOLVENTS.

ADVERTENCIA: NE PAS UTILISER D'ESSENCE DE PRODUITS DE VIDANGE NI D'HUILE CONTENANT DE L'ESSENCE OU DES SOLVANTS

AVERTISSEMENT: NO UTILICE LA GASOLINA, EL CÁRTER DEL MOTOR DRAININGS, O EL ACEITE QUE CONTIENE LA GASOLINA O SOLVENTES.



Installation

Fuel and fuel vapors are highly flammable and explosive

1. Use only fuel as specified in specifications. The use of incorrect fuel may result in fire or explosion and severe injury to the operator.
2. Fuel burning equipment must have proper ventilation for cooling, combustion air, and exhausting of combustion products. Stacking, where required, must be installed in accordance with all local codes. A draft diverter must be installed on a machine connected to an exhaust stack to prevent improper operation.
3. Stacking, where required, must be installed in accordance with all local codes. A draft diverter must be installed on a machine connected to an exhaust stack to prevent improper operation.
4. While stacking is not required, provide adequate ventilations to prevent any possible accumulation of hazardous fumes.
5. Personnel trained in and familiar with the type of machine being serviced should only perform adjustments to the machine.

SAVE THESE SAFETY INSTRUCTIONS

INSTALLATION

Location

This machine should be installed by only qualified technicians. The machine should be set upon a level surface where it will not be affected by strong winds, rain, snow, extreme heat, and freezing temperatures. Install the machine considering locations for chemical pick-up, fuel connections, electrical connections, water hook-up, venting, and maintenance.

Electrical

Connect machine to an electrically grounded circuit that is fused or circuit-breaker-protected. The circuit must match that which is specified in the ELECTRICAL section under MODEL SPECIFICATION.

Extension Cord

The use of an extension cord that has undersize wire compared to the amp draw of your machine will adversely limit the starting load carrying abilities of the motor and machine's performance. Use only extension cords that are intended for outdoor use. These extension cords are identified by a marking "Acceptable for use with outdoor appliances; store indoors while not in use." Use only extension cords having an electrical rating not less than the rating of the product. Do not use damaged extension cords. Use an extension cord in good repair free of frays or cracks in the outer covering. Do not abuse extension cord and do not yank on any cord to disconnect. Keep cord away from heat and sharp edges. Always disconnect the extension cord from the receptacle before disconnecting the product from the extension cord.

Installation(continued) & Venting

Copper Wire Size Minimum AWG	Machine AMP Draw* 3 Conductor Wires	Machine AMP Draw* 2 Conductor Wires
16	10	13
15	--	--
14	15	18
12	20	25
10	25	30
8	35	40
6	45	55
4	60	70
2	80	95

Based on Ambient Temperature of 86°F (30°C)

Based on no more than 100 feet

* Use AMP Draw indicated the same or higher than your machine output.

EXAMPLE: Machine AMP Draw 51, use 55 (2 Conductor): The thermostat type of cord shall be C, PD, E, EO, EN, S, So, SRD, SJ, SJO, SV, SVO, SP.

The thermo set plastic types shall be ET, ETT, ETLB, ETP, ST, STO, SRDT, SJT, SJTO, SVT, SVTO, and SPT.

WARNING: Risk of asphyxiation. Use this product only in a well-ventilated area.

ADVERTENCIA: Riesgo de asfixia. Este producto únicamente debe usarse en una zona bien ventilada.

AVERTISSEMENT: Risque d'asphyxie. Utilisez ce produit seulement dans une région bien aérée.



Venting

This machine emits carbon monoxide, a deadly gas, and must be vented if used in an enclosed area. Improper venting can cause poor combustion, delayed ignition, down drafts, and the possibility of freezing the coil. Contact your distributor or local heating and air conditioning dealer for proper materials. Local codes must be observed.

Venting(continued)

The information contained herein is offered for reference only. You must comply with local codes and investigate through your gas and other utility companies when installing, as there may be some special local requirements you must comply with. Also see ANSI Z223.

Draft Diverters (stacked cleaners)

Oil fired machines use a force air burner. The oil burner can be influenced by “natural Draft” even though they have their own fan. A bell type draft diverter must be used here also.

A draft diverter must be used on all cleaners that are stacked. This included any chimney even if not expelled to the outside.

Use a draft diverter of the inverted funnel or bell type that meets all codes for capacity and materials. Mount the draft diverter directly to the stacking flange on the machine.

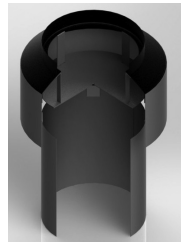
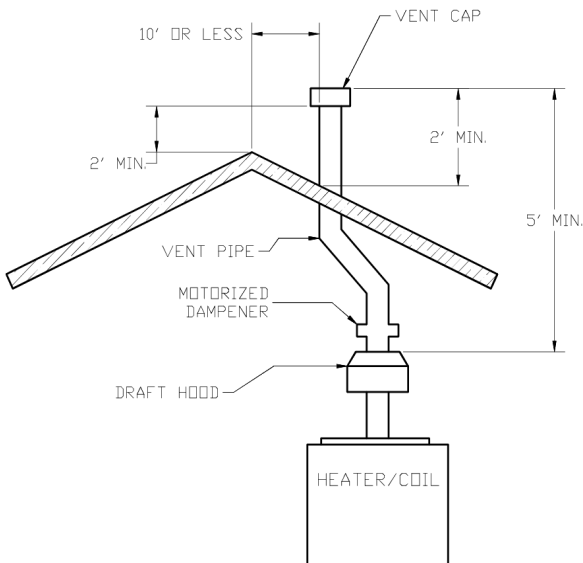
The draft diverter's function is to insure that the barometric pressures are as close to the same as possible at the air inlet and outlet to the coil and will not be changed by either up drafts or down drafts.

Installation of a draft diverter WILL not prevent the coil from freezing. In areas where freezing temperatures are common, some type of down draft prevention must be used. Check local codes for acceptable methods for the prevention of down drafts.

Venting Installation Information

Never reduce the stack size. The diverter and stacking should be the same size as the stack opening on the machine.

Straight stacking through the roof is preferred. Horizontal runs are not desirable, but if necessary, be sure to pitch the stack upward at a rate of two inches per foot. When horizontal stacks are used, vertical stacking must extend at least two feet for every foot of horizontal stack.



Water Supply, Barrier, Temp Variation, Conditions

Water Supply

This machine must have a water supply meeting or exceeding the maximum discharge volume specified in the PERFORMANCE section, and a minimum water inlet pressure specified in the GENERAL section of the MODEL SPECIFICATIONS.

Barrier

We recommend a barrier be installed between the machine and wash area to prevent moisture from coming in direct contact with electrical controls, motors and transformers. This will increase the machine's life and lessen electrical problems.

Water Temperature Variation

On machines not equipped with a temperature control device, the temperature of the discharged water is dependant on the incoming water temperature. Some minor adjustment to the fuel input may be required if the incoming water is significantly different than 50°F.

Water Conditions

Local water conditions affect the coil adversely more than any other element. In areas where troublesome conditions may exist with like equipment (such as water heaters), we recommend the use of a water softener.

Freezing

This machine must be protected from freezing according to storage section of MACHINE MAINTENANCE.

Cold Weather

As the weather becomes colder, fuel becomes thicker and may become so viscous that the fuel will not flow properly. As viscosity increases, the thicker oil can cause delayed ignition, poor spray patterns, and rumbling fires. As moisture will quickly destroy fuel pumps, make certain that tank openings are secure and moisture cannot enter. In cold weather areas, frost build up will occur in fuel tanks. As the weather warms it turns to condensate, and the water will be in the tank. Keep the tank clear of water, as moisture reaching the fuel pump will cause rust, and the pump will bind. A full fuel tank will lessen condensation build up.

Chemicals

Mix chemicals per the chemical manufacturer's printed directions. Follow all mixing, handling, application, and disposal instructions. Wear gloves, boots, goggles, and protective clothing appropriate for the chemical being used.

WARNING: Chemical Burn Hazard. Chemicals could cause burns resulting in death or serious injury, and/or property damage.

ADVERTENCIA: Riesgo de Quemadura Químico. Los productos químicos podrían causar quemaduras que causan la herida de muerte o seria, y/o el daño a la propiedad.

AVERTISSEMENT: Le Produit chimique Brûle le Hasard. Les produits chimiques pourraient provoquer brûle la conséquence dans la blessure mortelle ou sérieuse, et-ou le dommage de propriété.



Operations

Stack extension above the roofline should be sufficient to clear the peak of the roof (refer to ANSI Z223.1 page 100 of SPECIFICS).

A rain cap U.L approved should be installed on the stack.

PRE-OPERATIONAL INSTRUCTIONS

FUEL TANK:

Fill the fuel tank (If so equipped) with recommended Kerosene or #1 diesel fuel.

COLD WEATHER: As the weather becomes colder, fuel becomes thicker and may become so viscous that the fuel will not flow properly. As viscosity increases, the thicker oil can cause delayed ignition, poor spray patterns, and rumbling fires. As moisture will quickly destroy fuel pumps, make certain that tank openings are secure and moisture cannot enter. In cold weather areas, frost build up will occur in fuel tanks. As the weather warms it turns to condensate, and the water will be in the tank. Keep the tank clear of water, as moisture reaching the fuel pump will cause rust, and the pump will bind. A full fuel tank will lessen condensation build up.

VENTING

WARNING: This machine emits carbon monoxide, and deadly gas, and must be vented if used in an enclosed area. Improper venting can cause poor combustion, delayed ignition, down drafts, and the possibility of freezing the coil. Contact your distributor or local heating and air conditioning dealer for proper materials. Local codes must be observed.

PRE START-UP

1. The first time the machine is operated, after repairs have been made, or if the machine has set for a period of time (30 days or more) follow the following procedures.
 - A. Check the tension of the belt (if so equipped) per instructions in **MACHINE MAINTENANCE**.
 - B. Flush the machine per instructions in **MACHINE MAINTENANCE**.
 - C. Install float tank drain plug (if so equipped).
2. **CAUTION:** Always use the factory supplied wash hose with your machine. Do not substitute other hoses as a potential safety problem may develop.

WARNING: Protect machine from freezing.



ADVERTENCIA: Proteja la máquina contra la congelación.

AVERTISSEMENT: Protéger la machine contre le gel..

 **CAUTION**

 **Cuidado**

CAUTION: If machine has been exposed to sub-freezing temperatures, it must be thoroughly warmed to above freezing before operating. Failure to warm machine can cause damage to the pump packings and other components.

- ☐ **MAINTENANCE** Refer to the **MAINTENANCE SCHEDULE** for any maintenance to be performed before operation of this machine.
- “ **STACK COVER:** Remove the stack cover (if so equipped).
- ☐ **FUEL FILTER:** Inspect fuel filter for evidence of water contaminants.
- ☐ **FUEL TANK:** Make sure the fuel lines are connected to fuel inlet on left side of machine. Use #1 or #2 diesel. Gasoline must **NEVER** be used in the fuel tank.
- ☐ **FUEL QUANTITY:** Make sure the fuel supply is sufficient to complete the job. See the **SPECIFICATIONS** for the fuel tank capacity.
- “ **WATER SUPPLY:** This machine must have a water supply meeting or exceeding the maximum discharge volume specified in the **PERFORMANCE** section, and a minimum water inlet pressure of 10 PSI / 0.68 BAR.
 - ◆ **LIME:** Water containing large amounts of lime, calcium or other similar materials can produce a coating on the inside of the spray tip, impact nozzle and coil pipe.

WARNING: Fuel and its vapors are extremely flammable and explosive.

ADVERTENCIA: El combustible y sus vapores son muy inflamables y explosivos.

AVERTISSEMENT: Le combustible et ses vapeurs sont extrêmement inflammables et explosifs.



START-UP

CAUTION: Do not run the machine with the burner switch in the on position when the fuel tank is empty or with tank valves closed. This will cause damage to the fuel pump and void warranty.

1. Select temperature (if so equipped).
2. With a good flow of water turn the switch to the on position.

Shut Down

1. Turn the switch to the off position. (If not already done so in the cold water rinse.).
2. Turn off the electrical supply.
3. If freezing conditions may exist, refer to STORAGE in MACHINE MAINTENANCE.
4. Replace stack cover (if so equipped).

Maintenance

MACHINE MAINTENANCE **WATER HEATER OIL FIRED**

Coil Back Pressure Check

A regular maintenance schedule for descaling your heating coil is essential to insure its longevity.

The frequency of descaling depends upon the amount of use and the condition of the water.

Above is a cross section view showing the progressive liming of coils.



Coil Back Pressure Check Instructions

1. Check the condition of your water pump unloader valve. Remove the hose and gun assembly from the coil outlet.
2. Remove any flow restrictions, such as guns and hoses, from the coil outlet.
3. Install a pressure gauge between the water pump and coil inlet.

Discharge Volume Gallons per Minute/ Liters per minute	Back Pressure Requiring Descaling
2-3 GPM / 6-11.4 LPM	50 PSI
3-4 GPM / 11.4-15.1LPM	75 PSI
4-5 GPM / 15.1-18.9LPM	100 PSI
6 GPM / 22.7LPM	150 PSI
8-10 GPM / 30.3-38LPM	175 PSI
Use a 1000 PSI pressure gauge	

4. Turn on the water supply. Check the float valve (if so equipped) to assure float tank is full and the float valve shuts off securely.
5. Check the position of the ball valve (if so equipped) on the outlet line of the float tank assuring it is in the open position.
6. Turn on the switch to the "PUMP" position. If the coil back pressure reading is above that found in the chart above then your machine needs to be de-scaled.

A separate descaling pump is recommended so that scale and other chemicals will not come in contact with your water pump and cause premature wear.

NOTE: Contact your local dealer for descaling of your unit.

Flushing, Storage, Accessories

7. Disconnect the water supply.
8. Disconnect the electrical supply.
9. Reinstall the hose and gun assembly.
10. Remove the pressure gauge.

Descaling instructions are available upon request.

Flushing

1. Connect machine to an electrically grounded circuit that is fuse or circuit breaker protected.
2. Connect machine to a pressurized water supply meeting the requirements specified in the GENERAL section of the MODEL SPECIFICATIONS.
3. Turn on the water supply.
4. Check the float tank (if so equipped) to assure it is full and the float valve shuts off securely.
5. Check the position of the ball valve (if so equipped) on outlet line of the float tank assuring it is in the open position.
6. Remove spray tip from gun assembly.
7. With the gun assembly in hand (on trigger gun models hold the trigger gun valve in open position) and with a good flow of water turn switch to the PUMP position.

Storage

1. In conditions where freezing may occur - Fill a 1-gallon container with Ethylene Glycol type antifreeze. Minimum should be a mixture of ½ antifreeze and ½ water strength before each use, as the antifreeze will dilute with use.
2. **WITHOUT FLOAT TANK:** Install a 2-ft. garden hose to the water inlet. Insert the other end into a container of antifreeze solution.
3. Turn on the switch to the "PUMP" position.
4. Turn off the switch just prior to running out of antifreeze mixture.
5. Disconnect electrical supply.
6. Fill the fuel tank with #1 or #2 diesel.
7. It is recommended to install a coil cover to keep coil free of debris.
8. Drain the float tank.
9. Place machine in a dry place protected from weather condition.

ACCESSORIES

Part number Description

Y02-00001 0-1000 PSI (69 BAR) Pressure Gauge

Z01-00070-1 3/8" x 100 Yards Thread Tape

NOTE: All Gauges are Glycerin Filled ¼ NPT

Maintenance Schedule

WATER HEATER OIL FIRED CLEANERS

Leaks:

Check for water and build up of scale at pipe connections

Fuel:

Adequate fuel supply

Filter-Fuel:

If contaminants are present see FUEL FILTER insert

Remove and replace fuel filter.

Screen-Fuel Pump:

Check fuel pump screen for debris. See OIL BURNER MAINTENANCE insert

Burner Nozzle:

Replace nozzle as specified in BURNER section of MODEL SPECIFICATIONS or BURNER ASSEMBLY insert

Guards and Shields:

Check that all guards and shields are in place and secure

Pump Motor with Grease Fittings:

Remove drain plug. Use 1 or 2 full strokes of Shell "DOBLIUM RB", Chevron "SR! No.2" or Texaco "PREMIUM RB". Operate for 20 minutes and replace drain plug

daily

Each HR
1st 8 HRS

AFTER
1st 50
HRS

EVERY 50
HRS

EVERY
100 HRS

EVERY
500 HRS

YEARLY

