



Storage Tanks S- Series

Operating and Maintenance Manual





Ace Heaters LLC
INSTALLATION and MAINTENANCE
INSTRUCTIONS for
ACE STORAGE TANKS

A. INSTALLATION AND HOOKUP

- 1 Inspect tank and lining for shipping damage.
- 2 Place tank in desired location and carefully level the tank, making sure it is level front to back and side to side.
- 3 Firmly mount the tank to its foundation.
- 4 Remove all temporary fitting plugs from the tank tapings and discard.

Note: It is recommended to use dielectric connections on all tank fittings

- 5 Inspect and clean the fittings. Each fitting has been brushed or chased to remove lining particles that may have become embedded in the threads. Some fittings may require additional brushing or "chasing" with a die to allow a solid pipe connection.
- 6 Connect the cold water supply line (if applicable) to one of the lower connections at the bottom of the tank. Install a gate valve and union for supply shutoff as desired. Do not use a check valve on the cold water inlet unless an expansion tank has been added to the system.
- 7 The system return line shall be connected to the cold water supply line. (Refer to Drawing)
- 8 The hot water outlet line should be connected at the highest part of the tank to avoid air entrapment, which can cause rapid corrosion at the top of the tank. Install a gate valve and union for shutoff as desired.
- 9 The storage tank shall be protected with a relief valve. The relief valve shall not exceed the pressure rating stamped on the nameplate. The relief valve should be located at the top of the tank.
Refer to local and state codes for relief valve requirements.
Be sure to run drain pipe off of the relief valve to a safe drain.
- 10 Add the anode rods through the fitting provided on the tank.
- 11 Plug all unused fittings.
- 12 Install a tank drain with a gate valve on bottom of the tank. Run tank drain to a safe drain.
- 13 Flush the tank with cold water to remove any dirt or debris.

B.

MAINTENANCE

The following service is recommended monthly or more often, for proper and safe use of this equipment.

! WARNING:
Hot Water

Avoid contact with the hot discharge water to prevent the risk of serious injury.

! CAUTION:

Turn off the electricity and gas supply to the water heater piped to the tank.

- 1 With **CAUTION**, open the relief valve(s) momentarily by lifting the lever on the relief valve to relieve trapped air in the tank.
- 2 Check the tank pressure gauge (if provided). The pressure of the system should not exceed the pressure rating on the tank or the relief valve.
- 3 Open the drain valve at the bottom of the tank fully for about 30 seconds to remove any sludge that may have accumulated in the tank.
- 4 Check the anode rods . The magnesium rods are sacrificial and will need replacing before all the magnesium has been dissolved. Inspect after the first **3 months** and then on a regular preventative maintenance schedule.

C.

CLEAN TANK / YEARLY MAINTENANCE

! WARNING:
Hot Water

Avoid contact with the hot water discharge to prevent the risk of serious injury.

! CAUTION:

Turn off the electricity and gas supply to the water heater piped to the tank.

Turn

- 1 Shut off water supply to tank.
- 2 Shut off hot water supply valve at top of tank if one is used.
- 3 Open drain valve at bottom of tank and relieve pressure on tank.
- 4 With **CAUTION**, open relief valve on top of tank, or remove by unscrewing the valve, to allow air to enter the tank so water will drain freely.
COMPLETELY DRAIN THE TANK
- 5 Remove one manhole bolt and crab assembly once the tank is completely

- 6 With a block of wood about 12" long and a 2# hammer, hold the manhole cover and tap to break the gasket loose, dislodge cover from manhole ring **(Use caution, if dropped inside the tank it may damage the lining)**. The cover may now be pushed into the tank, and removed to outside, by rotating the manhole cover after removing the crab from bolt, and using the bolt for a handle to prevent dropping the cover within tank. The interior of tank may be viewed thru the open manhole. If the tank is cement or pre-krete lined, any sludge, mud, or other deposits may be washed out thru the drain, and lining scrubbed off with a coarse brush or wire brush.
- 7 A new manhole gasket will be required when placing the manhole cover. To facilitate replacement of the manhole gasket, and cover it will be helpful to tape the gasket to the cover with 4 pieces of adhesive tape, to avoid slippage of the gasket from cover. Gasket and cover should be centered carefully before tightening bolts, to avoid gasket leaking or blowing out.
- 8 Oil and tighten bolts moderately, refill tank and allow pressure to build up on tank before attempting to fully tighten bolts, as the water pressure will help seal the gasket.
- 9 Tanks with no manways will have two 2" inspection openings. You will need to use these two openings to visually inspect interior of tank and for flushing.
- 10 Dielectric Fittings should be inspected every 12 months using an OHM Meter (Must indicate NO continuity). The tank must be empty at the time inspection. If continuity is detected at the time of inspection, the dielectric fittings should be replaced or cleaned. The inspection should be repeated to ensure no future failures.

! NOTICE:

Ace Products must be installed and maintained by a qualified professional.

! NOTICE:

To maintain the warranty, all service / maintenance records must be provided at the time of the warranty claim.

! NOTICE:

Yearly inspection and clean out must be done to maintain the warranty

Ace Heaters LLC maintains a policy of continuous improvements and therefore reserves the right to change specifications without notice.



FACTORY LIMITED WARRANTY POLICY

The Ace Factory limited warranty provides assurance that all products are free from manufacturer defects at the time of shipment and meet specifications and performance described in the product literature.

It is important to understand the difference between a factory warranty and an installed warranty. There are many factors that can occur to the products after they are shipped that the company has no control over and can not fully verify. These includes:

1. Hidden damage during the shipping.
2. Handling damage.
3. Damage during storage.
4. Installation conditions.
5. Other unknown variables in the system design: maintenance, pulsation and vibrations.

The installed warranty is the responsibility of the architect, specifying engineer, contractor and/or owner who jointly have control over the application, installation, location, operating and maintenance conditions.

The Ace Heaters, LLC warranty excludes extended liabilities. Extended liability typically occurs when products are installed without proper drainage, flooding containment or when safety devices are not tested and repaired or replaced when needed.

Product problems are often caused by the condition of the water, the lack of water treatment and/or the improper treatment of the water, insufficient combustion air, improper draft conditions, bolts not re-tightened, pipes not flushed and cleaned of oil, metal chips, rags, vibration and pulsation etc. These are installation, operating and/or maintenance conditions that are beyond the seller's responsibility and are not covered by the factory warranty, but may be covered by the installer's warranty.

The factory warranty covering company products is based upon extensive product development and testing. Combustion products under go certification testing and approvals to Underwriters Laboratory (UL) standards. Auditing of the production of combustion products is conducted by a nationally recognized testing laboratory.

Pressure vessel products are designed and manufactured to American Society of Mechanical Engineering (ASME) and National Board (NB) Design standards. Design reviews, factory product manufacturing quality inspections and testing are carried out by a third party National Board authorized inspection agency.

Ace Heaters, LLC products have proven themselves in service for over 85 years which indicates that the company products perform exceedingly well when normal installation, operating and maintenance conditions exist.

The following is a review from the terms and conditions of sale. Also included in paragraph two, below, is the Ace Heaters LLC nonconformance policy.

1. Ace Heaters, LLC warrants its products against defective material and/or workmanship only. The warranty does not apply to operational failures, electrical failures, gasket leaks, and/or other malfunctions caused by improper application, installation and/or maintenance.
2. It is the buyer's responsibility to inspect and accept the product, when received, as conforming to their purchase order, specifications and approved drawings. All claims for non-conformance, errors, shortages, etc. must be made within 10 days after receipt of the shipment.
3. Ace Heaters, LLC do not provide a warranty or guarantee, express or implied, in any manner, form, usage of trade, merchantability or fitness which extend beyond the product description and quotation.
4. Ace Heaters, LLC liability is limited to the factory repair or replacement of warranty failures, or non-conformance, upon the return of the product to the factory.
5. Ace Heaters, LLC is not liable for any direct or consequential damages.
6. Ace Heaters, LLC warranty is based upon section 23161(2) of the uniform commercial code and is printed in the terms and conditions of sale which is referenced in every quotation, on the back of sales order acknowledgements and invoices. It is legally correct and is an industry standard policy.



Water Heater – Water Quality Requirements

Properly ensuring the water within the water heater is treated is essential for maintaining the water heaters performance over time and preserving the components connected to the system. It is advisable to manage any water treatment program under the guidance of a water treatment specialist.

Water heaters can suffer from scale buildup and chemically induced corrosion due to poor water quality. Among these problems, the most common is the formation of scale inside the unit, which predominantly occurs on the hottest surface; the u-tube bundle heat exchanger. The accumulation of scale in the unit can lead to a reduction in the water heater's capacity as it coats the heat exchanger surface.

Poor water quality can contribute to chemically induced corrosion of the heat exchanger or the vessel. Different forms of chemically induced corrosion may arise, including general corrosion, pitting corrosion, and stress corrosion. Such corrosion has the potential to significantly decrease the lifespan of the vessel or the tube bundle. General corrosion might manifest as a uniform deterioration of the tube, tubesheet, or vessel material, eventually causing material failure. Pitting corrosion involves the creation of small pits on the tubes, tubesheet, or shell, which can ultimately lead to material failure. Stress corrosion results in stress corrosion cracking. This refers to the development of brittle cracks along the metal's stress lines and grain boundaries. Stress corrosion cracking is more likely to affect materials like austenitic stainless steel, such as the grade 316L commonly used in the water heater's vessel, tubes, and tubesheet. This type of corrosion is associated with the presence of chlorides in the water. The likelihood of stress corrosion cracking increases with higher concentrations of chlorides and temperatures.

Under normal design and operating conditions, the water temperatures within a water heater usually remain below the threshold required for stress corrosion to occur.

Ace Heaters, LLC requires all water heaters to be operated within the following ranges to help control corrosion and scaling:

Water Property	Range
Alkalinity (CO ₃ , HCO ₃)	Less than 300 ppm
Chlorides	Less than 100 ppm
Conductivity	Less than 1,500 ppm (3,000 uS/cm)
pH	6-8
Silica	Less than 150 ppm
Sulfates	Less than 250 ppm
Total Dissolved Solids	Less than 50 ppm
Total Hardnes (Ca and Mg)	Less than 150 ppm



WARRANTY

Limited

Ace Heaters, LLC provides a limited warranty on its products against **defective material and/or workmanship only**. This limited warranty is not applicable to operational failures, electrical failures, gasket leaks, wear or malfunctions caused by improper application, storage, installation, and/or maintenance.

Product Period - The following Limited Warranty period are from date of shipment:

Tanks

Tanks - Carbon Steel: One Year

Tanks - Stainless Steel: Three Years

Storage Water Heaters Single-wall or Double-wall Tank/Exchanger Coils: One Year

Clean Steam Generators: One Year

Linings: (Pro-rated Warranty)

Magnesium Anodes must be used at all times to maintain the Limit Warranty

Section VIII Tanks:

Epoxy: 30" dia. and above (Three years)

Glass: 24" dia. and under (One year).

Glass: 30" dia. and above (Five years).

Cement: (Five years).

Pre-Krete: (Ten years).

Section IV Tanks: SW Model Only

Glass (One year) & Epoxy (Three years).

Minipacks™ Single-wall or Double-wall: One Year

Shell & Tube Heat Exchangers Single-wall or Double-wall: One Year

Atlas™ Series Condensing Boiler (Heat Exchanger): One Year

Triton™ Series Near Condensing Boiler (Heat Exchanger): Twelve Years

Liberty™ Series Condensing Boiler (Heat Exchanger): Ten Years

B-Series Copper Fin Boiler: Three Years

Controls: Components manufactured by other than Ace Heaters, LLC such as controls, instruments, forced draft burner, etc., provided with the boilers and packaged products are not covered by the Ace Heaters, LLC Warranty. However, Ace Heaters, LLC extends to the customer the same warranty provided by the manufacturer to Ace Heaters, LLC. The customer shall receive the full benefits of adjustments made to Ace Heaters, LLC by the manufacturer.

Any claim for adjustment under this limited warranty must be made within the warranty period. Ace Heaters, LLC's liability shall be limited to factory repair or, at Ace Heaters, LLC's option, replacement of all parts which, upon test and examination by Ace Heaters, LLC, prove to be defective material and/or workmanship and within the above limited warranty. If required by Ace Heaters, LLC, parts which are claimed to be defective must be promptly delivered to the Ace Heaters, LLC facility, transportation charges prepaid. This warranty does not cover the cost of labor, removal, or installation of the warranted item during the limited period. This warranty is limited to the above and applies only for the period set forth. Ace Heaters, LLC will not be liable for any loss damage, direct, incidental or consequential damages of any kind, whether based upon warranty, contract, negligence or strict liability and arising in connection with the sale, use or repair of the products. Ace heaters's maximum liability shall exceed the contract price for the product's merchantability or fitness for any particular purpose and in no event shall be held responsible for any consequential damages.

For complete Limited Warranty conditions see Section G and H under terms and condition of sale.

Ace Heaters, LLC, also doing business as Ace Heaters, LLC, is referred to herein as Ace Heaters, LLC



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Ace Heaters, LLC

WARNING

PRODUCT SAFETY NOTICE

ACE BOILER AND WATER HEATER PRODUCTS OPERATE AT HIGH TEMPERATURE AND PRESSURES

- Before using this product, read and understand instructions. Save these instructions for future use.
- Before servicing, to prevent serious burns or injury, the boiler and water heater products must be cooled to less than 80°F (27°C) and the pressure must be 0 psi (0 bar).
- Turn off the electrical power before making electrical connections to prevent electrical shock.
- These products must be placed in a controlled location where untrained or unqualified personnel cannot access the operating or safety controls, must not be able to come in contact with high temperature or high pressure parts and must not perform maintenance or demolition work.
- All work performed must be by qualified properly equipped personnel trained in the proper application, installation, and maintenance or demolition of plumbing, steam, and electrical equipment and/or systems in accordance with all applicable codes and ordinances.
- ACE Boilers and Water Heaters are complete package units with safety and operating controls and are constructed with non ASBESTOS materials. Any replacement gaskets, refractory, insulation, etc used must not contain Asbestos.
- No additional insulation is required on the Boilers and Water Heaters.
- Additions or replacement of insulation on any connecting pipes or accessories to the Boilers and/or Water Heaters must be of "NON-ASBESTOS" and contain only non-hazardous materials.
- Crystalline Silica, a material known to cause cancer, may be encapsulated in some refractory or insulation materials and must be handled only by authorized trained personnel. Crystalline Silica as used is encapsulated and is not harm full in this form. Care must be taken during removal or replacement of refractory or insulation to remove it in bulk form and avoid generation or inhalation of dust. Removal must be properly performed by trained, qualified and equipped personnel. This is also true of Asbestos not contained in ACE products but may be otherwise contained in replacement materials or parts, in connecting piping or other nearby products.
- All safety and operating controls must be set within the specified operating limits and tested periodically to assure proper operation. All limit and operating controls must be installed in series on the boiler.
- Connect drain pipes to a safe drain to prevent serious personal injury from relief valve discharge and or from boiler blow down discharge.
- After installation, check for proper operation of all limit and operating controls before leaving the site.
- Perform scheduled and annual inspections including checking Controls for proper calibration and performance.

Failure to follow these warnings, to allow access by unauthorized persons and the use of non-properly trained and equipped personnel in the operation, service, modification, removal or demolition of these products or replacement of parts with non-authorized factory non-asbestos materials could cause damage, personal injury or death.



Ace Heaters. LLC
www.aceheaters.com

NOTICE

This owners & operation manual provides warnings of risk of harm from improper installation, operation and/or maintenance of Ace Products. Ace Heaters, LLC used ordinary care and complied with UL and ASME Standards in the design and manufacture of Ace Products. Proper installation, operation and maintenance are covered in the manual supplied with the product. All equipment must comply with local codes.

WARNING

THIS PRODUCT CONTAINS CRYSTALLINE SILICA, A CHEMICAL KNOWN TO CAUSE CANCER. CONTAINS NO ASBESTOS.

ATTENTION ACE Series Storage Tank

Glass Lined

GLASS LINED TANK REQUIRES THE USE OF MAGNESIUM ANODES. ANODES ARE SHIPPED LOOSE. INSTALL ANODES BEFORE FILLING TANK WITH WATER.

Check the anode rods. The magnesium rods are sacrificial and will need replacing before all the magnesium has been dissolved. Inspect after the first 3 months and then on a regular preventive maintenance schedule.

Replace anodes if 5/8" or less in diameter. Failure to maintain anodes will void warranty. Keep all records of anode inspection and replacement for warranty guarantee.

Cement Lined

Cement lined tanks are to be kept closed so that the cement can remain moist to prevent cracking. The lining must not be allowed to dehydrate prior to the vessel being put into service. Reasonable care must be taken during shipping and handling so that the lining is not damaged.

Upon leaving the factory, the tank will have a small amount of water in them. Once received and inspected for freight damage, after it has been installed fill the tank with water.

If the tank is not installed immediately and will be stored, place in a shaded area with the tank filled with 2" - 4" of water.

Upon placing the tank into service, remove the PVC plugs supplied by the factory and flush the tank to remove and impurities that may be left behind from the standing water.

Ace Heaters, LLC

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SO # _____

Serial No. _____

Model No. _____



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