

Safety

General

P-K WATER STORAGE TANKS

All P-K WATER STORAGE TANKS must be:

- Installed, operated, and serviced in accordance with instructions contained in this manual and other supplemental manuals.
- Installed by qualified personnel in accordance with designs prepared by qualified facility engineers including: structural, mechanical, electrical, and other applicable disciplines.
- Operated and serviced in accordance with a comprehensive safety program determined and established by the customer. Do not attempt to operate or service until such a program is established.
- Operated and serviced by experienced, qualified, and properly trained personnel in accordance with all applicable codes, laws, and regulations.

Safety Precautions

Provide a suitable location for the appliance, away from normal personnel traffic, with adequate working space, adequate clearances, proper ventilation and lighting, with a structure sufficiently strong and rigid to support the weight of the appliance, all piping, and accessories.

NOTICE!

Each safety device must be maintained and checked per the recommended schedule. Refer to [5 Maintenance](#).

SAFETY FEATURES

It is the responsibility of the customer to ensure external safety provisions such as, but not limited to, guards, safety labels, safety controls, interlocks, lockout devices are in place and operable.

SAFETY LABELS

The following words are used in this manual to denote the degree of seriousness of the individual hazards.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTICE/NOTE - NOTICE

Is the preferred signal word to address practices not related to personal injury. The safety alert symbol is not used with this signal word.

Training

Proper training is the best protection against accidents. It is **essential** to read, understand, and follow the recommendations of this manual before installing, operating, or servicing this equipment. Failure to do so could result in explosion and serious injury, death, and/or property damage.

Operating and service personnel must be thoroughly familiar with the basic construction of the appliances, the use and locations of the controls, the operation of the appliance, adjustment of their various mechanisms, and all applicable safety precautions. If any of the provisions of this manual are not fully and completely understood, contact Harsco Industrial Patterson-Kelley Technical Service at **570.476.7261** or toll free at **877.728.5351**.

Hazard Warnings

Electrical Hazards



Shock Hazard! Properly lockout/tagout the electrical service and all other energy sources before working on or near the appliance.

Shock Hazard! Do not spray water directly on this appliance or any electrical components.

Electrical Hazard! Do not alter wiring connections.

Crush Hazards



Lifting Hazards! Use properly rated lifting equipment to lift and position the appliance. The load may be unbalanced. Test the balance before lifting off the floor. Do not allow personnel beneath the lifted load. Refer to the approximate weights in the table.

Appliance capacity	Vertical Weight (in lbs.)	Horizontal weight (in lbs.)
80 gal	200	-
119 gal	225	-
200 gal	550	-
210 gal	-	650
320 gal	750	775
415 gal	1000	1025

Pressure Hazards



Pressure Hazard! Hot fluids. Install isolation valves on appliance water inlet(s) and outlet(s). Make sure isolation valves are closed before servicing appliance.

Pressure Hazard! Hot fluids. Monthly test safety relief valve(s) for proper operation. Do not operate appliance with faulty relief valve(s).

Slip, Fall Hazards



Tripping Hazard! Do not install piping on floor surfaces. Maintain a clear path around the appliance.

Slip and Fall Hazard! Use a drip pan to catch water while draining the appliance. Maintain dry floor surfaces.

Fall Hazard! Do not stand or climb on appliance.

Chemical Hazards



General Warning

Chemical Hazards from Cleaning Products. Use caution when cleaning the system. The use of professional assistance is recommended. Use safe procedures for the disposal of all cleaning solutions.

Burn Hazards



Hot Surface

Burn Hazard! Pipes and appliance components could be hot. Do not touch piping or surfaces during operation or immediately after shutdown of the appliance.

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1 Introduction

This manual describes the installation and operation of P-K series appliances.

If you have any questions on the information contained within, or do not fully and completely understand the content, please contact Harsco Industrial Patterson-Kelley Technical Service at **570.476.7261** or toll free at **877.728.5351**.

The P-K WATER STORAGE TANK appliance is fully-packaged storage tank with two inches of closed-cell insulation, 24 gauge steel jacket with enamel coating, and two inch channel rails for moving and transportation. The high-quality materials and design of the appliance should provide years of trouble-free service if the instructions in this manual are followed carefully.

The appliance is only a part of the complete water heating system. This appliance may be fully operational and yet because of poor circulation, improper control or other site related characteristics, not deliver adequate hot water to the desired location. Additional equipment such as temperature sensors, pumps, flow switches, balancing valves, and check valves will be required for satisfactory operation of any system. Harsco Industrial Patterson-Kelley cannot be responsible for the design or operation of such systems and a qualified engineer or contractor must be consulted.

While details may differ slightly, basic operation is the same for all models. Appliances may be built to operate with different maximum allowable working pressures (MAWP). Check the rating plate for correct pressure ratings.

WARNING

If the information in this manual is not followed, explosion may result causing property damage, personal injury, or loss of life.

WARNING

It is essential to read, understand, and follow the recommendations of this manual before installing, operating or servicing this equipment. Failure to do so could result in personal injury or death.

WARNING

Installation and service must be performed by a qualified installer, or service agency. Failure to install the equipment in accordance with this manual could result in an unsafe operating condition

1.1 Purpose of this Document

This Installation and Owner's Manual's purpose is to provide complete documentation support for P-K WATER STORAGE TANK. Harsco Industrial Patterson-Kelley is constantly seeking ways to produce high quality HVAC products. Our operation is based on the premium quality control program and insures that Harsco Industrial manufactures and sells quality products.

The primary concern of all Harsco Industrial Patterson-Kelley equipment installation procedures is Safety. Safety instructions and considerations are presented and repeated throughout the document as needed. If you have any questions on the information contained within, or do not fully and completely understand the content, please contact Harsco Industrial Patterson-Kelley Technical Service at **570.476.7261** or toll free at **877.728.5351**.

WARNING

The appliance is heavy and requires additional technicians to support and move the unit(s) during installation. Use extreme caution to avoid dropping the appliance or cause any bodily injury while lifting or handling. When positioning this appliance, maintain positive control of it at all times. Do not attempt to move the appliance on surfaces that are not level. Failure to heed this warning could result in personal injury or death.

WARNING

Bumping hazard from overhead piping! Install all components with adequate vertical clearances. Insufficient clearance can restrict the service access, increasing the possibility of injury.

2 Site Preparation

2.1 Initial Inspection upon Receiving

Upon receiving the appliance, inspect it for signs of shipping damage. Some damage may be hidden. Unpack the appliance, and inspect the appliance. Verify that the total number of pieces shown on the packing slip agrees with those actually received.

2.2 Storage Prior to Installation

If the appliance is not installed immediately, it must be stored in a location adequately protected from the weather, preferably indoors. If this is not possible, then it should remain in the shipping container and be covered by a tarpaulin or other waterproof covering.

2.3 Compliance with Codes

All P-K WATER STORAGE TANK are constructed and stamped in accordance with **ASME Boiler and Pressure Vessel Code, Section IV – “HLW” (latest edition)** for 180°F maximum temperature. Refer to the table below for the MAWP of each model. Other codes or approvals which apply will be labeled on the appliance.

Appliance capacity	Standard MAWP (psig)	Optional MAWP (psig)
80 gal	150	-
119 gal	150	-
200 gal	150	-
210 gal	125	150
320 gal	125	150
415 gal	125	150

Installation of the appliance must conform to all the requirements of all national, state and local codes established by the authorities having jurisdiction. Authorities having jurisdiction should be consulted before making any installation.

NOTICE!

Controls and other equipment that are damaged or fail due to weather exposure are not covered by warranty.

NOTICE!

Note any damage, suspected potential damage, or shortage of materials on the freight bill and immediately notify the carrier. File all claims for shortage or damage with the carrier. Claims for hidden damages must be filed with your carrier within 7 days.

2.4 Location Setup

2.4.1 Foundation

The appliance must be installed on a level foundation designed to support the full weight of a filled appliance, all piping, pumps, and other equipment.

Once the appliance is situated, use a bubble level to ensure the unit is completely level.

The appliance should be secured to the foundation with proper lag bolts or other sufficient hardware using the supplied base and/or saddles. All horizontal units are shipped installed on saddles appropriately sized to support the weight of the vessel.

2.4.2 Clearances

Failure to provide adequate service clearances, even with non-combustible surfaces, may present problems during routine maintenance of the appliance.

2.5 Water Quality Standard

The P-K WATER STORAGE TANK appliance's materials of construction may include stainless steel. The appliance requires proper water conditions to function properly. The maximum chloride concentration for stainless steel appliances is three (3) part-per-million and 150°F.

NOTICE!

The appliance should be installed in such a manner that should the appliance or any connection leak, the resulting flow or water will not cause damage.

NOTICE!

Failure to maintain the water quality according to the requirements of water quality standards can void the warranty

3 Installation

3.1 Overview

For site preparation follow the guidelines established in Section 2. Section 3 details the installation requirements for electrical connections, hydronic piping, etc.

3.2 Appliance Connections

The table below summarizes the appliance connections to the P-K WATER STORAGE TANK appliances. All connections must be in compliance with national, state, and local code requirements.

⚠ WARNING

Incorrect installation can cause rapid failure of appliance due to electrolysis. It is vital that this risk is reduced by the use of dielectric connections, isolation of the tank supports, proper grounding techniques and regular anode servicing.

Appliance Connection	80 gal	119 gal	200 gal	210 gal	320 gal	415 gal
Inlet Nozzles	2" NPT	2-1/2" NPT		3" NPT		
Temperature Sensor	3/4" NPT					
System Outlet	2" NPT	2-1/2" NPT				
Relief Valve	1" NPT			1-1/4" NPT		
Drain	3/4" NPT		1" NPT			

3.3 Compatible Patterson-Kelley equipment connections

This information is provided for our customer's reference only.

Product line	Model	Domestic water return	Domestic water supply
DURATION III	D3-44, D3-88, D3-112	2" Victaulic® pipe groove	
	D3-44P, D3-44PE, D3-88P, D3-88PE	2" O.D. copper tubing	
SONIC	SCD650, SCD750, SCD850, SCD1000	2" O.D Victaulic copper tube groove	
P-K MFD and VELOX	W750MFD, W1000MFD, W1500MFD, W2000MFD	2-1/2" MPT	2-1/2" FPT
P-K VELOX	W750VX, W1000VX, W1500VX, W1700VX, W2000VX	2-1/2" MPT	2-1/2" FPT
P-K MACH 'n' Roll	MnR300, MnR399, MNR500, MnR750, MnR1050	2" O.D. Victaulic copper tube groove	

3.4 Electrical Connections

3.4.1 Power Requirements

The P-K WATER STORAGE TANK requires either tank sensor or a temperature thermostat (aquastat) in order to maintain the desired temperature inside the appliance.

When connecting this appliance to a water heater equipped with a Patterson-Kelley NURO® controller, please note the following:

- The aquastat or temperature sensor should be wired to the **DHW Stat/Sensor** terminals inside the low voltage junction box.
- If using an aquastat use an SPST normally-closed, break-on-rise type with either a fixed or adjustable deadband above and below the setpoint. Contact your local Patterson-Kelley factory representative for additional information on purchasing this component.
- If using a temperature sensor, it must be a 2-wire 12kΩ NTC thermistor and be of sufficient length to measure an accurate storage tank temperature.
- Patterson-Kelley offers a dual-element 4-wire 12kΩ NTC thermistor tank sensor. This sensor provides a temperature input for two NURO controllers and allows for cascading domestic water and back-up control. Contact your local Patterson-Kelley factory representative for additional information on purchasing this component.
- The DHW Stat/Sensor circuit is energized by the NURO with a 5VDC potential
- Refer to your water heater's *Installation and Owner's Manual* for additional wiring information
- Refer to the *NURO Boiler Controller: Advanced User's Guide*, Part Number is 1004905979, for instructions on how to set-up your domestic water operations.

When connecting this appliance to a water heater equipped with different controls, please refer to the owner's manual that came with your water heater for wiring and set-up instructions.

CAUTION

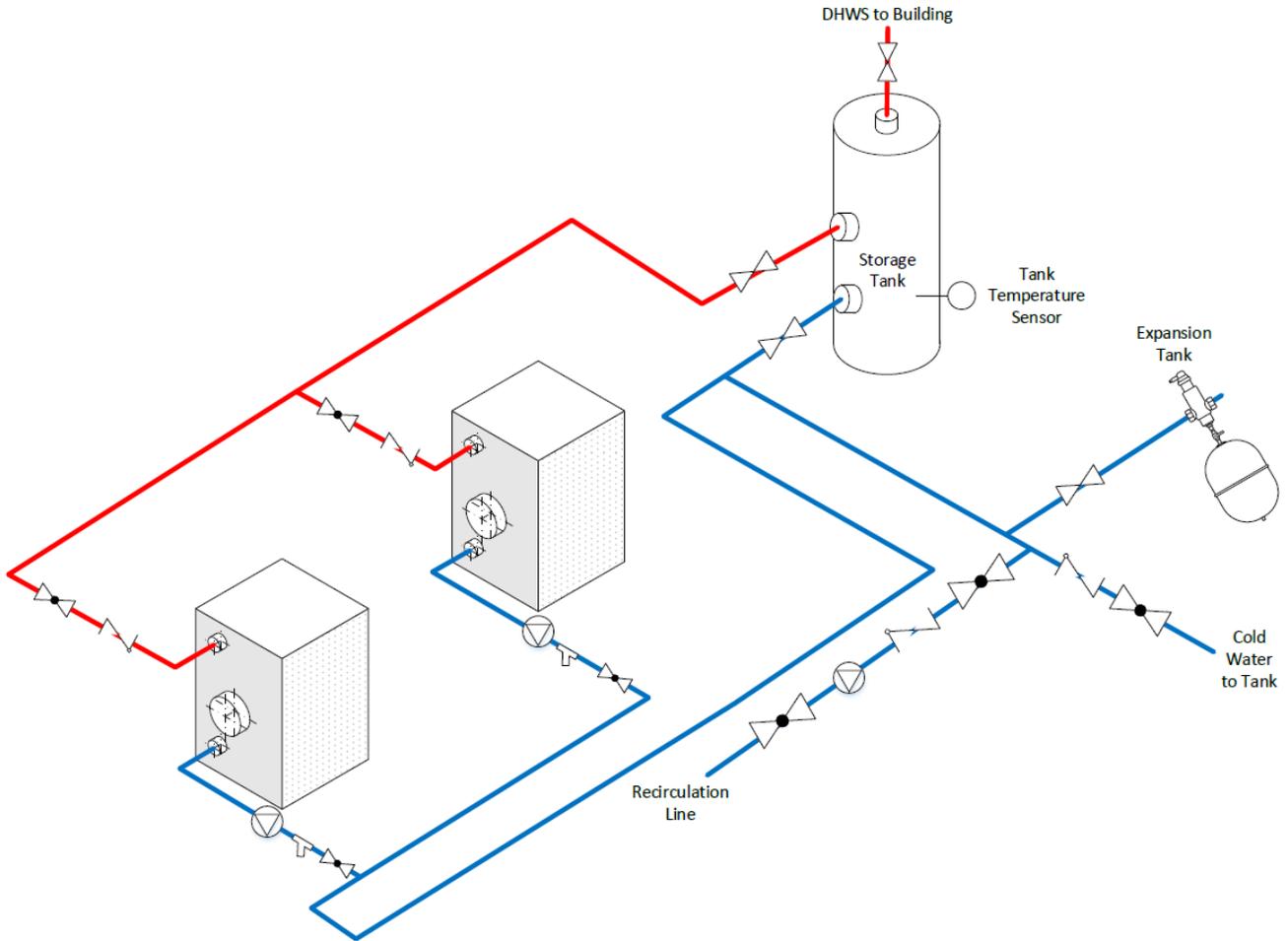
Disconnect power supply before beginning installation to prevent electrical shock or equipment damage.

NOTICE!

All wiring must comply with local codes and ordinances

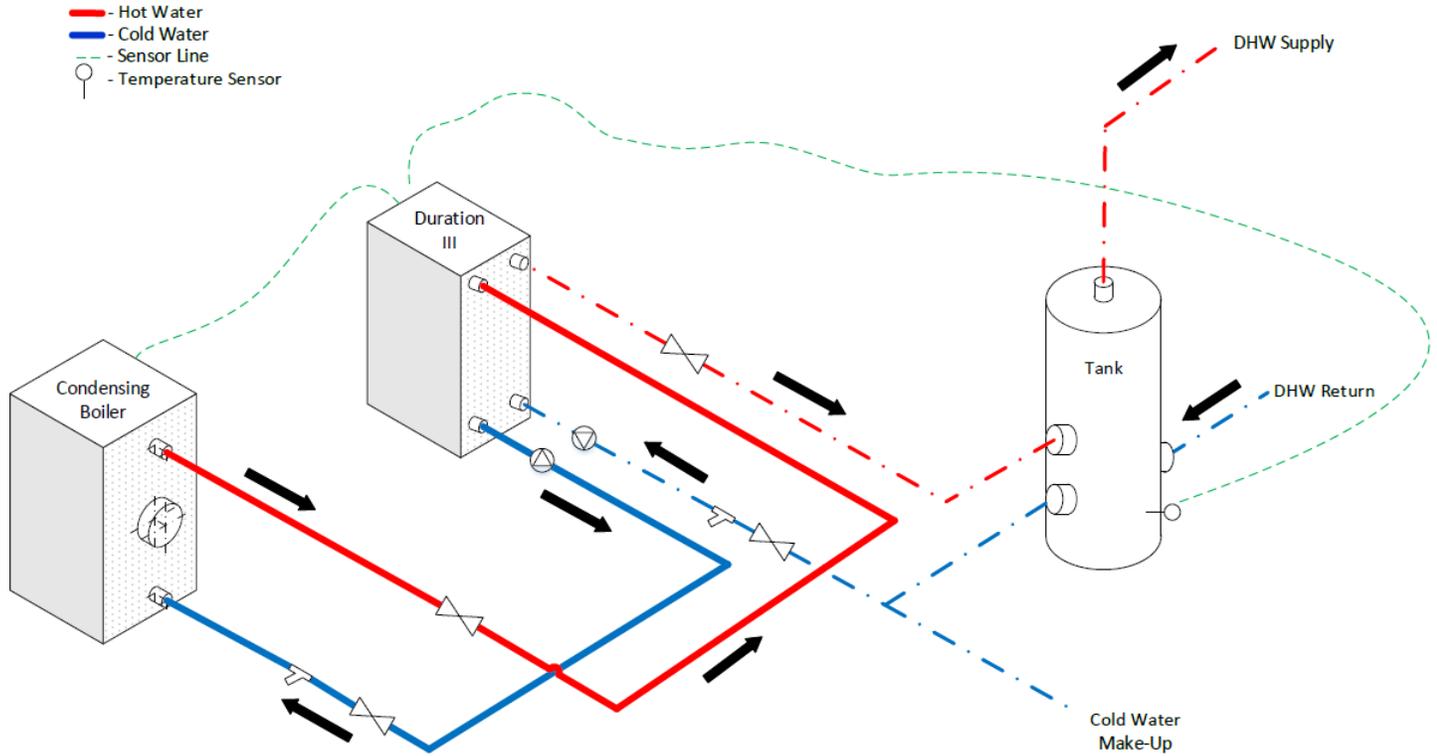
3.5 Piping

3.5.1 Sample Piping Diagram – SONIC Hot Water Supply Boilers



NOTICE!
Refer to [Appendix B – Best Practices For New & Retrofit Systems](#) for best piping practices for both new and retrofit appliance installations.

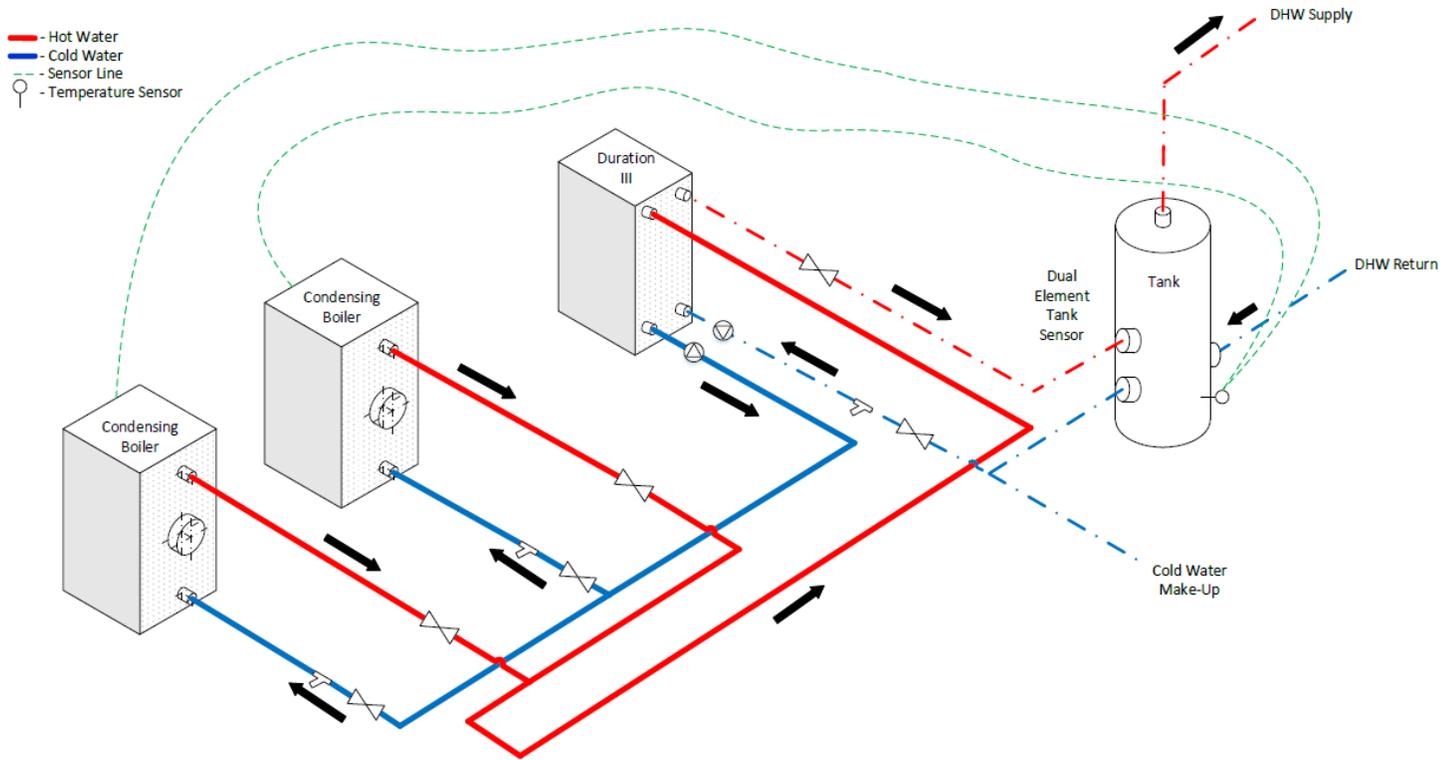
3.5.2 Sample Piping Diagram – DURATION III



NOTICE!

Refer to [Appendix B – Best Practices For New & Retrofit Systems](#) for best piping practices for both new and retrofit appliance installations.

3.5.3 Sample Piping Diagram – DURATION III w/ dual element tank sensor



NOTICE!
Refer to [Appendix B – Best Practices For New & Retrofit Systems](#) for best piping practices for both new and retrofit appliance installations.

3.5.4 Appliance Connections

All water connections should be in compliance with national, state and local code requirements. Adapters from Victaulic to NPT are available from Harsco Industrial Patterson-Kelley, including certain styles of dielectric fittings. Please contact your local Patterson-Kelley factory representative for additional information on these components.

3.5.5 Water Piping (for Installer)

Strainer

To avoid possible contamination of the appliance with dirt, rust or sediment from the water supply or domestic water system, a strainer near the appliance inlet is strongly recommended. Even new systems may contain sufficient foreign material. Adequate circulation of good clean water is essential for the long life of the appliance and the other system components.

Relief Valve Piping

A relief valve connection is provided near the top of each appliance. An ASME Section IV safety relief valve or an ASME temperature & pressure safety relief valve is required to be installed on the appliance. The pressure setting of the safety valve must be less than or equal to the MAWP of the appliance or upon the component with the lowest MAWP rating; whichever is lowest.

The required relieving capacity (in BTU/hr) of the safety relief valve shall be greater than or equal to the maximum allowable input capacity of the attached water heater(s).

No shutoff valve of any type or function may be placed between the appliance and the safety valve.

The relief valve discharge must be piped to an acceptable drain at a safe point of discharge. Reducing couplings or other restrictions are not permitted in the discharge line. No shutoff valve of any type or function may be placed in the discharge piping between the valve and the drain.

Drain Valve and Piping

A drain valve is factory installed at or near the bottom of the appliance. Prior to draining the appliance, electrical power must be turned off to the appliance, and the appliance must be isolated from the system at the supply and return connections. Reducing couplings should not be installed in the appliance's drain piping.

Expansion tank

If the system is equipped with pressure reducing valves and/or check valves in the cold water inlet, the system shall be evaluated to ensure an expansion tank is not required. If not installed, the thermal expansion of the water may cause the safety relief valve to open periodically.

WARNING

This appliance conforms to ASME Section IV – HLW code. An ASME Section IV safety relief valve OR an ASME temperature & pressure safety relief valve is required to protect this appliance.

CAUTION

The safety relief valve's discharge should be piped so there is no danger of scalding should it open and discharge hot water.

NOTICE!

Some of the equipment in the domestic system may conform to different sections of the ASME code and therefore have their own unique relief valve requirements. Ensure you understand all the components of your domestic system and meet the applicable requirements for overpressure protection.

NOTICE!

This drain valve is factory installed for draining of the appliance's water only, not the entire system. Draining of the system through the appliance will result in depositing sediment from the system in the appliance which may result in plugging up the drain valve and early appliance failure. Not all water will be removed during the drain process.

Reducing couplings should not be installed in the drain piping

4 Operations

4.1 Pre-Start Checklist

4.1.1 Manway installation (if applicable)

Not all appliances are equipped with a manway. If your vessel has a manway, follow the procedures laid out below before filling your appliance with water.

Manway covers and gaskets are shipped in place so they will not be lost in shipment. **The bolts securing the manway in place are NOT tightened**, so be sure to check for shifting of the gasket due to vibration in transit.

The manway is not completely secured to the appliance so that the appliance can be opened, cleaned, and inspected prior to being put into service. Once the manway bolts are fully torqued, the gasket cannot be re-used. Use only a 12" crescent wrench to tighten the bolts: DO NOT use any persuasion bars or pry bars to tighten.

For final assembly of the manway, the gasket must cover the surface of the ring 100% and project slightly on each side of the ring. The bolts should be tightened before the appliance has been pressurized and then re-tightened when the appliance is at operating temperature.

DO NOT use adhesives, glues, epoxies, or other such materials to secure the gasket in place. Use only the gasket that was supplied with the manway. If additional gaskets are required, or a replacement is needed, please contact your local Patterson-Kelley factory representative or call the factory directly at 1.877.728.5351. Please supply your tank size when calling.

4.1.2 Filling your system with water

After installation, fill the system with clean water and run at operating temperature for at least one day in a closed loop mode. Then drain the system and re-fill with clean water. This is an attempt to minimize debris and particulates in the system that accumulate in new installations.

4.1.3 Water Quality

The appliance's materials of construction may include passivated 316L stainless steel. The material requires proper water conditions to remain efficient and function properly. The maximum chloride concentration is 3 parts-per-million and 150°F.

If the piping system attached to this unit will be chemically cleaned, the appliance must be disconnected from the system and a bypass installed so that the chemical cleaning solution does not circulate through the appliance. Following chemical cleaning, the system should be thoroughly rinsed to remove cleaning agents prior to reconnecting the appliance to the system.

 **WARNING**

The bolts securing the manway in place for transit are NOT tightened. Be sure to properly tighten the bolts before pressurizing the appliance or serious injury can occur.

4.2 Shut Off Procedures

4.2.1 Normal (short term) Shutdown

Simply eliminate the introduction of additional domestic cold and hot water into the storage tank. This operation will be different depending on the source of your hot water needs. Please consult the appropriate Installation Manual for the appliance connected to the storage tank.

4.2.2 Extended Shutdown

For extended shut-downs, the following procedure should be adhered to:

1. Turn off power to the connected appliance.
2. Isolate the storage tank by manually closing the isolation valves on the inlet and outlet domestic water connections.
3. Remove the drain pipe cap, or open the drain valve to drain the unit of all domestic water.

5 Maintenance

5.1 Preventative Maintenance

5.1.1 Daily

- Observe operating temperature and general conditions
- If the system pumps are making noise, ensure they are not deadheaded or cavitating. Call a qualified service technician to troubleshoot the problem and implement corrective actions
- Check for leaks in the appliance or surrounding piping. Correct immediately if discovered.

NOTICE!

Proper maintenance schedule and record keeping is critical for optimum performance and to maintain the Harsco Industrial Patterson-Kelley warranty.

5.1.2 Monthly: Safety relief valves

- Check all safety relief valves by slightly opening the stem. Once you see a small amount of water exit the discharge, close the relief valve's stem. Once the stem is closed, ensure there is no additional water that exits the relief valve.
- Open the drain to remove silt and sediment from the appliance. Allow the appliance to drain until the water runs clean.



WARNING

This water may be hot.

5.1.3 Semi-Annually: Sacrificial anode rod inspection and replacement

For glass-lined appliances, all the anode rods included with the appliance should be checked and cleaned every six months.

Should their diameter be reduced by twenty percent (20%) or more, they should be replaced. The tanks are supplied with twenty-five (25) grams of anode per square foot of tank area.

Replacement anode rods are available from Patterson-Kelley. Please specify tank size when ordering replacement rods. Refer to [Section 6.1 Replacement parts below](#).

The use of a water softener may increase the speed of anode consumption. More frequent inspection of the anode is needed when using softened or phosphate-treated water

5.2 After Repairs or Maintenance

Following any major repairs or preventative maintenance, follow the steps above in "Section [4.1 Pre-Start Checklist](#)" above before returning the appliance to service.

NOTICE!

Installation and service must be performed by a qualified installer or service agency that has been trained on the Harsco Industrial Patterson-Kelley appliance!

5.3 Troubleshooting

Should the appliance not perform as expected, call a qualified service technician to troubleshoot the problem and implement corrective actions.

5.3.1 Appliance above or below setpoint

If the appliance is not maintaining the proper temperature the following conditions should be checked:

- If a thermostat (aquastat) is controlling the appliance, check to make sure the proper temperature is set on the controller (refer to the thermostat's manual for setting the temperature). Follow the troubleshooting guide included with the thermostat to additional troubleshooting techniques. If needed, replace the thermostat.
- If a tank sensor is controlling the appliance, verify the setpoint on the NURO (refer to the *NURO Boiler Controller: Advanced User's Guide*, Part Number is 1004905979, for additional information on setting up the tank sensor). If the controller is set properly, check the sensor is powered and a valid reading is provided to the NURO controller. If needed, replace the sensor. If the appliance is connected to a water heater without a NURO controller, refer to the Installation and Owner's manual included with the water heater for troubleshooting guides.

5.3.2 Low water temperature

Ensure the water heater connected to the appliance is operating properly and not in a 'high temperature' lock-out. Check your water heater's manual for information on manual reset lockouts.

6 Parts/Technical Support

Spare parts and replacement parts can be ordered from Harsco Industrial Patterson-Kelley by calling toll free **(877) 728-5351**. Reach us by fax at **(570) 476-7247**.

Refer to the parts list provided in this manual.

Technical information is also available by calling or visit the Harsco Industrial Patterson-Kelley website, www.harscopk.com.

When ordering replacement parts please have the model number and serial number of your appliance available.

Typical schematic drawings are shown on the following pages. Drawings specific to your particular appliance can also be supplied by your local Harsco Industrial Patterson-Kelley representative.

NOTICE!

Spare parts and replacement parts can be ordered from Harsco Industrial Patterson-Kelley by calling toll free **(877) 728-5351**. Reach us by fax at **(570) 476-7247**.

6.1 Replacement parts

Anodes

<i>Appliance Connection</i>	<i>80 gal</i>	<i>119 gal</i>	<i>200 gal</i>	<i>210 gal</i>	<i>320 gal</i>	<i>415 gal</i>
<i>P-K Part Number</i>	28-0000-0031			28-0000-0032		28-0000-0033
<i>Qty. Required</i>	1	1	2	2	3	3



Specific limited warranty, last updated 3/24/2017

LIMITED COMMERCIAL WATER STORAGE TANK WARRANTY

WHAT DOES THIS LIMITED WARRANTY COVER?

This limited warranty covers both the glass-lined tank and component parts for leakage or other malfunction caused by defects in materials and/or workmanship. It extends to the first buyer and to any subsequent owner(s) as long as the water storage tank remains installed at its original place of installation.

WHAT DOES THIS LIMITED WARRANTY NOT COVER?

1. This limited warranty does not cover leakage or other malfunction caused by:
 - a) Defective installation, and specifically, any installation which is made:
 - i) in violation of applicable state or local plumbing, housing or building codes, or
 - ii) without a certified American Gas Association, ASME, or comparable combination temperature and pressure relief valve, or
 - iii) contrary to the written instructions furnished with the unit.
 - b) Adverse local conditions, and specifically, sediment or lime precipitate in the tank or corrosive elements in the atmosphere.
 - c) Misuse, and specifically, operations, and maintenance contrary to the written instructions furnished with the unit, removal of anode(s), disconnection, alteration or addition of non-approved components or apparatus, operation with fuels or at settings other than those set forth on the rating plate, or accidental or other exterior damage.
2. This warranty also does not cover:
 - a) Production of noise, taste, odors, discoloration or rusty water.
 - b) Incidental property damage, loss of use, inconvenience or other incidental or consequential costs.
 - c) Costs associated with the replacement and/or repair of the unit, including:
 - i) any freight, shipping or delivery charges
 - ii) any removal, installation or re-installation charges
 - iii) any material, and/or permits required for installation, re-installation or repair
 - iv) charges to return the defective water heater and/or component part to the manufacturer.

WHAT IS THE PERIOD OF COVERAGE?

This limited warranty runs from date of installation (or without proof of installation, from three (3) months after the date of manufacture) for the period specified on the following chart. To determine length of coverage, check model number listed on the rating plate of appliance against this chart.

MODEL NUMBER PREFIX	LIMITED TANK** WARRANTY	LIMITED PARTS** WARRANTY
D, H, V, LD, DB, PDV, F-I, L-I-6, M,M-I, M-II, EF, LH-I, LV-I, TW, DH, SW, CDW, PDX, P, E, U	1, 3, 5 or 6 YRS	1 YEAR
M3ST, BST, NH, NV	5 YRS	1 YEAR
No Letter Prefix	1,3 or 5 YRS	1 YEAR

NOTE: The duration of the tank warranty will be found in the model number.

i.e.: D80T1991N has a 1 Year tank warranty

D80T1993N has a 3 Year tank warranty

50T-65-3N has a 3 Year tank warranty

50T-65-5N has a 5 Year tank warranty

**All replacement water storage tanks and parts carry the balance of the original warranty, i.e. if an original three (3) year water storage tank warranted if a leak develops due to defects in materials/workmanship after only two (2) years, the replacement unit is warranted for only the balance remaining from the original three (3) year warranty, or one (1) year in this example.

WHAT IS THE DURATION OF THE IMPLIED WARRANTY?

ANY IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY IMPOSED ON THE SALE OF THE WATER STORAGE TANK UNDER THE LAWS OF THE STATE OF SALE ARE LIMITED IN DURATION TO ONE YEAR FROM DATE OF ORIGINAL INSTALLATION.

HOW DOES STATE LAW RELATE TO THE WARRANTY?

Some states do not allow:

1. Limitations on how long an implied warranty lasts.
2. Limitations on incidental or consequential damages.

So the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state

•Restrictions are not applicable to implied warranties in California. See "Special State Provisions" on reverse side.

Harsco Industrial Patterson-Kelley Specific Limited Warranty (1004905936 REV A) 3/24/2017



Specific limited warranty, last updated 3/24/2017

LIMITED COMMERCIAL WATER STORAGE TANK WARRANTY (CONTINUED)

WHAT WILL WE DO TO CORRECT PROBLEMS?

If a defect occurs within the warranty period, we will:

1. Provide a replacement water storage tank of our manufacture, (or at our option) repair any unit which develops a leak in the steel tank within the tank warranty period. To obtain a replacement, you must forward the rating plate from the defective unit to the factory. If government regulations require the replacement water storage tank to have features not found in the defective water storage tank, you will be required to pay the difference in price represented by those government required features.
2. Provide a replacement part (or at our option repair) any part which fails to function within the parts warranty period. To obtain a replacement, you must forward the defective part to us. If government regulations require the replacement part to have features not found in the defective part, you will be required to pay the difference in price represented by those government required features.

We do reserve the right to verify any claims of defect by inspection.

WHAT WILL WE NOT DO?

We will not:

1. Repair or replace any water storage tank, or part, subject to conditions outlined in "What Does This Limited Warranty Not Cover?"
2. Reimburse any costs associated with repair and/or replacement.
3. Replace and/or repair any water storage tank without complete model/serial number.
4. Replace any water storage tank without prior receipt of actual rating plate from appliance.

HOW DO YOU GET WARRANTY ASSISTANCE?

Upon discovering a defect or problem, you should:

1. Contact either the installer or factory representative, or
2. Contact us--

PATTERSON-KELLEY
CUSTOMER SERVICE
155 BURSON ST.
EAST STROUDSBURG, PA 18064
570-421-7500

WHAT SHOULD YOU DO TO KEEP THE WARRANTY IN EFFECT?

To facilitate warranty assistance, you should:

1. Follow all instructions enclosed with the product O&M manual. If lost contact representative or factory or download from <http://newsite.harscopk.com/>
2. Retain all bills of sale or receipts for proof of installation, etc.
3. Contact your installer, representative as soon as any problem or defect is noticed.
4. When necessary, allow us, or our chosen representative, to inspect the unit.
5. For your reference, fill in the Model and Serial Number found on the units Rating Plate:

Model Number _____ Serial

Number _____

Date of Installation _____

SPECIAL STATE PROVISIONS

For water heaters installed in California or Oregon, Paragraphs 2(c) (i) (iv) of the paragraph "WHAT DOES THIS WARRANTY NOT COVER?" does not apply. All other terms and conditions of this warranty apply as stated.

PLEASE RETAIN THIS WARRANTY IN A SAFE LOCATION FOR FUTURE REFERENCE.

8 Storage Tank Start Up Report



P-K STORAGE TANK START-UP REPORT

Date: _____

Boiler Serial # _____ Model # _____

Installation: Name: _____ City: _____

State: _____ Zip: _____ Contact _____ Phone: _____

Installer Name: _____ Type of Installation: _____ (Hotel, School, etc.)

Tank controller _____ Aquastat _____ Temperature sensor

Flow through tank: _____ GPM

Operating Temperature Setpoint: _____ ° F (from internal OR external control)

System Water pH level _____

Comments:

Performed by PK

Certified Agent: _____
(Print Name)

Start Up Certification # _____

A copy must be returned within 30 days of startup to Harsco Industrial Patterson-Kelley
Harsco Industrial Patterson-Kelley • 155 Burson Street • E. Stroudsburg, PA 18301
P) 570-476-7261 F) 570-476-7247 pkboilers@harsco.com

Appendix B – Best Practices For New & Retrofit Systems

BEST PRACTICES FOR ALL HOT WATER SUPPLY BOILER INSTALLATIONS

1. Patterson-Kelley recommends and most installation codes require isolation valves on both the inlet (return) and outlet (supply) pipe runs. These are used to hydraulically isolate the appliance from the system, which should be standard practice when flushing.
2. Patterson-Kelley recommends installing purge valves on the appliance's return-side isolation valves. These valves should be used to purge the domestic hot water system of debris and sediment prior to the initial startup of the equipment. Since the purge valves are located on the system side of the water heater's isolation valves, the debris and sediment will not be routed in direct proximity to the appliance.
3. Patterson-Kelley recommends installing a standard mesh strainer (maximum 20 mesh) on each appliance's inlet (return) piping. This is intended to prevent large particles, foreign debris, etc. from entering and obstructing flow through the appliance. Each strainer should feature a manual blow-down valve in order to purge the debris from the strainer. **NOTE:** This strainer is not intended to remove fine particulate matter from the domestic water system.
4. Oxygen (O₂) elimination is critical to the longevity of any domestic water system. Patterson-Kelley recommends installing Automatic Air Vents in the "high points" of the piping in order to purge the system of dissolved Oxygen and air. Automatic Air Vents are preferred over manual air vents in order to continually purge the domestic water system.
5. Well in advance of the equipment startup, turn off all circulation pumps and close the isolation valves on each appliance's inlet (return) and outlet (supply) pipe runs. Connect a hose to the purge valves and run this hose to a nearby floor drain. Open each purge valve to flush out debris that is present in the water. This process may take several attempts until the discharge water is sufficiently clean. After successfully purging the system, make sure to open the isolation valves and turn on the circulation pumps.

Appendix C – Installation and Quick Reference

Water Connections

All water connections should be in compliance with national, state and local code requirements. Adapters from Victaulic to NPT are available from Harsco Industrial Patterson-Kelley.

The table below summarizes the appliance connections to the P-K WATER STORAGE TANK appliances. All connections must be in compliance with national, state, and local code requirements.

Appliance capacity	80 gal	119 gal	200 gal	210 gal	320 gal	415 gal
Heater nozzles	2" NPT	2-1/2" NPT		3" NPT		
Temp sensor	3/4" NPT					
System outlet	2" NPT	2-1/2" NPT				
Relief valve	1" NPT			1-1/4" NPT		
Drain	3/4" NPT		1" NPT			

Compatible Patterson-Kelley equipment connections

The information below summarizes the appliance connections to compatible Patterson-Kelley water heater equipment. This information is provided for our customer's reference only. Refer to the latest documentation online at www.harscopk.com or by contacting your local Patterson-Kelley factory representative.

Product line	Model	Domestic water return	Domestic water supply
DURATION III	D3-44, D3-88, D3-112	2" Victaulic® pipe groove	
	D3-44P, D3-44PE, D3-88P, D3-88PE	2" O.D. copper tubing	
SONIC	SCD650, SCD750, SCD850, SCD1000	2" O.D Victaulic copper tube groove	
P-K MFD and VELOX	W750MFD, W1000MFD, W1500MFD, W2000MFD	2-1/2" MPT	2-1/2" FPT
P-K VELOX	W750VX, W1000VX, W1500VX, W1700VX, W2000VX	2-1/2" MPT	2-1/2" FPT
P-K MACH 'n' Roll	MnR300, MnR399, MNR500, MnR750, MnR1050	2" O.D. Victaulic copper tube groove	