



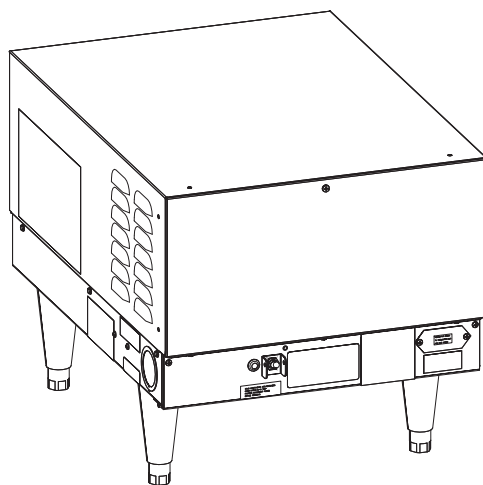
BRADFORD WHITE[®]

W A T E R H E A T E R S

MAGNUM Series Commercial Electric Booster

Installation and Operating Manual

I&W #07.05.228.00



Do not operate this equipment unless you have read and understood the contents of this manual! Failure to follow the instructions contained in this manual may result in serious injury or death. This manual contains important safety information concerning the maintenance, use, and operation of this product. If you're unable to understand the contents of this manual, please bring it to the attention of your supervisor. Keep this manual in a safe location for future reference.



No opere este equipo al menos que haya leído y comprendido el contenido de este manual! Cualquier falla en el seguimiento de las instrucciones contenidas en este manual puede resultar en un serio lesión o muerte. Este manual contiene importante información sobre seguridad concierne al mantenimiento, uso y operación de este producto. Si usted no puede entender el contenido de este manual por favor pregunte a su supervisor. Almacenar este manual en una localización segura para la referencia futura.

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IMPORTANT OWNER INFORMATION

Record the model number, serial number, voltage, and purchase date of the unit in the spaces below (specification label located on the unit). Please have this information available when calling Bradford White for service assistance.

Model No. _____

Serial No. _____

Voltage _____

Date of Purchase _____

Business Hours: 8:00 AM to 7:00 PM EST

Telephone: 800.334.3393 — Technical Service
800.538.2020 — Service Parts
800.531.2111 — Warranty Service

Additional information can be found by visiting our web site at www.bradfordwhite.com.

INTRODUCTION

The Bradford White Magnum Series Commercial Electric Booster water heater is designed for use with commercial dishwashers to boost the temperature of the regularly available hot water, usually 110°–150°F (43°–66°C) up to 180°F (82°C). Water at 180°F (82°C) can be used as sanitizing rinse water in commercial dishwashers in accordance with Health Codes, NSF Standard #5 and plumbing codes.

Bradford White Commercial Electric Booster water heaters are ready for electrical and plumbing service connections, with a pre-set ambient compensated immersion thermostat and a high temperature limit switch. The service area is accessible from the front of the unit, permitting easy installation.

Bradford White Commercial Electric Booster water heaters are products of extensive research and field testing. The materials used were selected for maximum durability, attractive appearance, and optimum performance. Every unit is inspected and tested thoroughly prior to shipment.

This manual provides the installation, safety, and operating instructions for Bradford White Commercial Electric Booster water heaters. Bradford White recommends all installation, operating, and safety instructions appearing in this manual be read prior to installation or operation of the unit.

Safety information that appears in this manual is identified by the following signal word panels:



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



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to personal injury.

IMPORTANT SAFETY INFORMATION



Read the following important safety information before using this equipment to avoid serious injury or death and to avoid damage to equipment or property.

WARNING

ELECTRIC SHOCK HAZARD:

- This unit must be installed by qualified, trained installers. Installation must conform to all local electrical and plumbing codes. Check with your local plumbing and electrical inspectors for proper procedures and codes.
- Turn power OFF at disconnect switch/circuit breaker and allow unit to cool before performing any maintenance or cleaning.
- Consult a licensed electrical contractor for proper electrical installation conforming to local electrical codes and the National Electrical Code (N.E.C.).
- Unit is not weatherproof. Locate unit indoors where ambient air temperature is a minimum of 70°F (21°C).
- Do not place aftermarket covers on or over booster water heater. Doing so can cause temperature and moisture build-up resulting in premature failure and electrical shock.
- This unit must be serviced by qualified personnel only. Service by unqualified personnel may lead to electric shock or burn.
- Use only Genuine Bradford White Replacement Parts when service is required. Failure to use Genuine Bradford White Replacement Parts will void all warranties and may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn. Genuine Bradford White Replacement Parts are specified to operate safely in the environments in which they are used. Some aftermarket or generic replacement parts do not have the characteristics that will allow them to operate safely in Bradford White equipment.

EXPLOSION HAZARD: Do not store or use gasoline or other flammable vapors or liquids in the vicinity of this or any other appliance.

Bradford White has always endorsed the use of safety equipment when using an booster water heater or storage-type water heater. Bradford White booster water heaters are shipped with a temperature/pressure relief valve at no extra charge. This valve must be installed into the marked opening provided in the tank. Valves supplied with this booster water heater are designed for high temperature commercial operation. Do not substitute these valves with valves designed for domestic water heaters.

Temperature/pressure protective equipment should not be less than a combination temperature/pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of the production of this equipment and meets the requirements for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22-1979. The temperature/pressure relief valve must be marked with a minimum set pressure not to exceed the marked hydrostatic test pressure of the booster heater as noted on the unit specifications.

Do not connect an expansion tank of any type to booster water heater lines.

WARNING

FOR INSTALLING COMBINATION TEMPERATURE/PRESSURE RELIEF VALVES IN ACCORDANCE WITH AMERICAN NATIONAL STD. Z21.22-1979. Combination temperature/pressure relief valves with extension thermostats must be installed so that the temperature-sensing element is immersed in the water within the top 6" (152 mm) of the tank. They must be installed either in the hot outlet service line or directly in a tank tapping. Combination temperature/pressure relief valves that do not have extension elements must be mounted directly in a tank tapping located within the top 6" (152 mm) of the tank, and shall be adequately insulated and located so as to assure isolation from the flue gas heat or other ambient conditions that are not indicative of stored water temperature. TO AVOID WATER DAMAGE OR SCALDING DUE TO VALVE OPERATION, DRAIN PIPE MUST BE CONNECTED TO VALVE OUTLET AND RUN TO A SAFE PLACE OF DISPOSAL. Discharge line must be as short as possible and be the same size as the valve discharge connection throughout its entire length. Drain line must pitch downward from the valve and must terminate between 1-1/2" (38 mm) and 6" (152 mm) above the floor drain where any discharge will be clearly visible. The drain line shall terminate plain, not threaded, with material serviceable for temperatures up to 250°F (121°C) or greater. Excessive length, over 30' (9144 mm), or use of more than four elbows can cause a restriction and reduce the discharge capacity of the valve. No shut-off valve shall be installed between the relief valve and tank, or in the drain line. Valve lever must be tripped periodically to assure that waterways are clear. This device is designated for emergency safety relief and shall not be used as an operating control. The valves are set to relieve at 150 psi (1034 kPa) or when water temperature reaches 210°F (99°C). Read tag on valve for additional information.

Inspect combination temperature/pressure relief valve at least once every two to four years, depending on local water conditions. Contact a licensed plumber or qualified service technician for inspection. Replace valve, if necessary. DO NOT attempt to self-inspect valve.

Use only plumbing material suitable for a minimum water temperature of 200°F (93°C). Materials used must meet National Sanitation Foundation (NSF) specifications and all local plumbing codes and regulations.

Install booster water heater in horizontal position with base parallel to the floor and inlet connection at the lowest point. If installing with legs, mount on floor. If installing with slide brackets, mount under dish table. DO NOT mount on walls or in ceiling. Unit must be accessible for service. Improper installation could create an unsafe condition.

Valves supplied with this booster water heater are designed for high temperature commercial operation. Do not substitute these valves with valves designed for domestic water heaters.

IMPORTANT SAFETY INFORMATION



Read the following important safety information before using this equipment to avoid serious injury or death and to avoid damage to equipment or property.

WARNING

Units are equipped with a high temperature limit safety switch that will shut off power if the unit overheats. Contact an Authorized Service Agent if high temperature limit safety switch cannot be reset or continues to trip.

Install booster water heater as close as possible to the commercial dish machine. Employ recirculation if distance between booster and commercial dish machine exceeds National Sanitation Foundation (NSF) specifications of five (5) linear feet (1524 mm).

Make sure the dish table is strong enough to support the weight of the booster heater and water when installing with slide mounting brackets.

Follow standard welding safety and operational procedures when attaching sliderails to bottom of dish table.

This product contains fiberglass, a product known to the state of California to cause cancer, birth defects or other reproductive harm.

It is essential to recognize that even though a booster water heater may be installed properly and approved initially, there always exists the possibility that unknowing individuals might alter or change the installation in a manner that would render it unsafe. Therefore, it is important that all safety programs provide some mechanism to assure that these installations are inspected periodically.

This unit has no “user-serviceable” parts. If service is required on this unit, contact an Authorized Service Agent or the Bradford White Service Department.

CAUTION

BURN HAZARD:

- Water in unit is very hot. Wear protective gloves and proper attire when operating to avoid injury.
- Some exterior surfaces on unit will get hot. Avoid unnecessary contact with unit.
- Valves supplied with this booster water heater are designed for high temperature commercial operation. Do not substitute these valves with valves designed for domestic water heaters.

Do not use anti-siphon or check valves on incoming water line.

Do not connect booster water heater directly to a boiler or furnace coil or any other uncontrolled temperature source. The booster heater thermostat could be damaged causing unit to overheat.

Do not connect booster water heater to domestic (consumer) dishwashers or other domestic utilized equipment. Hot water from booster heater may damage domestic equipment resulting in a hazardous condition.

CAUTION

Do not store any materials or items on or against the housing of the booster water heater.

Bradford White requires that two temperature/pressure gauges be installed to assure proper operation. Install one in the supply line before the pressure reducing valve and one in the outlet line as close to the booster water heater as possible. This provides a visual check of the water temperature and pressure before and after the water heater.

If water supply pressure to the booster water heater inlet is over 20 psi (138 kPa) during flow, install a commercial-grade pressure reducing valve with built-in bypass for proper operation of dish machine rinse nozzles.

NOTE: The pressure reducing valve must be the type equipped with a high pressure bypass, like the valve supplied with this booster water heater.

NOTICE

DO NOT turn on power to the booster water heater until tank has been filled with water and all air has been vented through dish machine rinse nozzle. The heating elements will burn out in seconds if operated when they are not immersed in water.

ALWAYS drain booster water heater with power to the unit off or element burnout could occur.

Use dielectric couplings when connecting dissimilar metals, such as galvanized to copper. This will prevent electrolysis or premature plumbing damage.

DO NOT turn or adjust inlet water connection on Magnum Series booster water heaters. Doing so will change the internal water flow.

Do not back out or loosen any pipe fittings. Doing so may cause leaks.

Do not lay unit on the side with the control panel. Damage to the unit could occur.

Incoming water in excess of 3 grains of hardness per gallon (GPG) (0.75 grains of hardness per liter [GPL]) must be treated and softened before being supplied to booster heater(s). Water containing over 3 GPG (0.75 GPL) will decrease efficiency, increase energy use, and reduce the operating life of the unit through increased lime build-up. Product failure caused by liming or sediment buildup is not covered under warranty.

Do not use deionized or reverse osmosis (R.O.) treated water in booster water heaters. Damage to booster heater may occur.

Connect electric booster water heater to the same power supply as indicated on the specification decal only. Connecting unit to an incorrect power supply voids the product warranty and will damage the equipment.

MODEL DESCRIPTION

Magnum Series Commercial Electric Booster

The Magnum Series Commercial Electric Booster water heater includes a booster heater with low-water cut-off system, temperature/pressure relief valve, pressure reducing valve with built-in high pressure bypass, two temperature/pressure gauges and a high temperature limit safety switch.

Magnum Series models feature a Castone® tank with a 5 year limited warranty, an ON/OFF switch, an indicator light and either 6" (152 mm) legs or slide mounting brackets for mounting under a dish table. Magnum Series units have a capacity of 6 gallons (23 liters) and provide up to 573 gph (2169 lph) of sanitizing rinse water based on a 40°F (22°C) temperature rise.

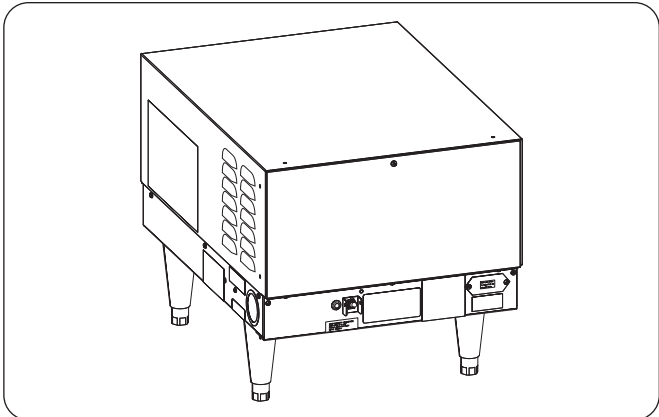
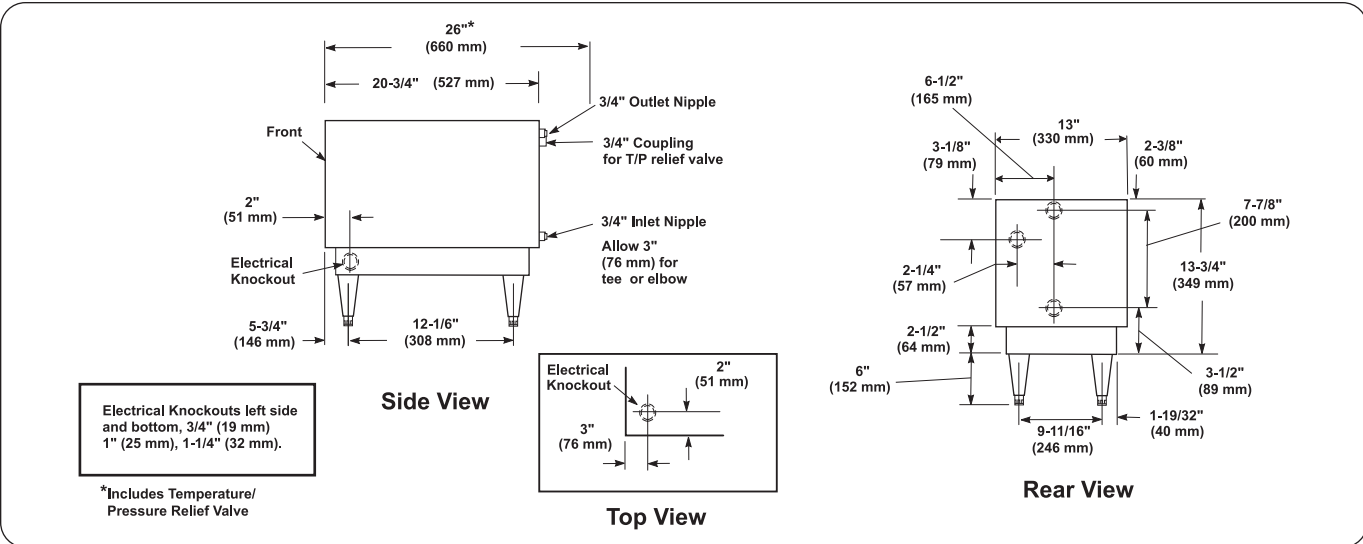


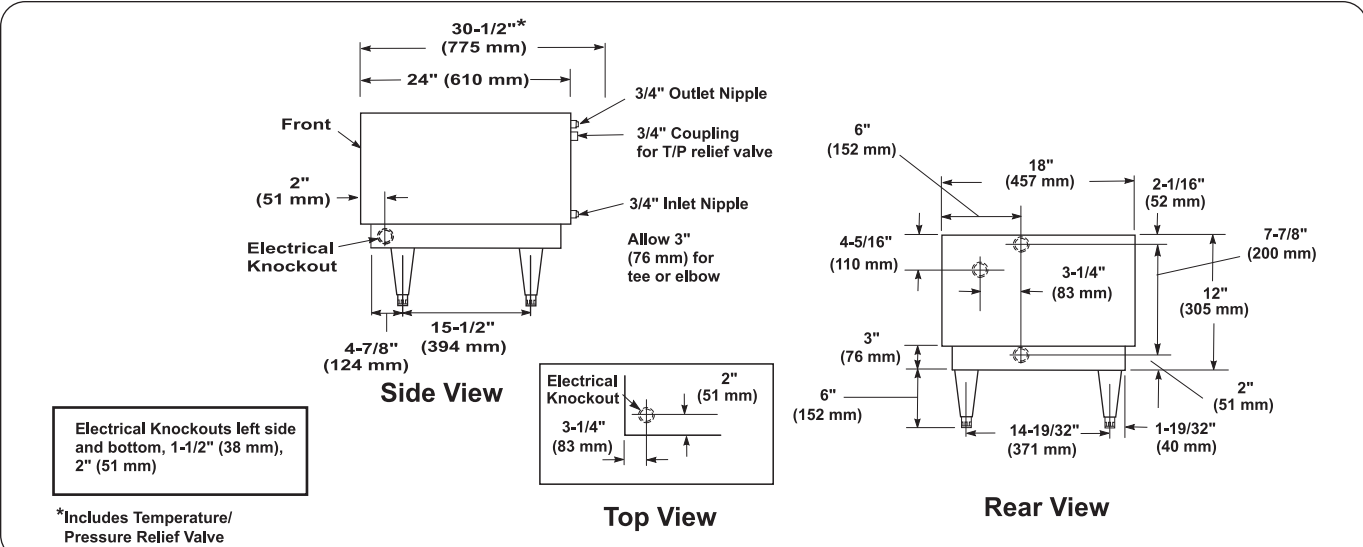
Figure 1. Magnum Series Commercial Electric Booster

SPECIFICATIONS

Dimensions — Magnum Series 6 to 18 kW



Dimensions — Magnum Series 24 to 57 kW



SPECIFICATIONS

Circuit Breaker and Fused Disconnect Switch Sizes — 6 to 30 kW

Model	kW	Volts	Phase	Amp Draw			Breaker or Fuse Size	Copper Wire Size	Conduit Size
				L1	L2	L3			
LI663CFC	6	208	1	29	29	-	40	8	1/2" (13 mm)
LI663CFD	6	208	3	14	25	14	40	8	1/2" (13 mm)
LI663CFE	6	240	1	25	25	-	40	8	1/2" (13 mm)
LI663CFF	6	240	3	13	22	13	30	10	1/2" (13 mm)
LI663CFM	6	480	3	6	11	6	15	14	1/2" (13 mm)
LI693CFC	9	208	1	43	43	-	60	6	1/2" (13 mm)
LI693CFD	9	208	3	22	38	22	50	8	1/2" (13 mm)
LI693CFE	9	240	1	38	38	-	50	8	1/2" (13 mm)
LI693CFF	9	240	3	19	33	19	50	8	1/2" (13 mm)
LI693CFM	9	480	3	9	16	9	20	12	1/2" (13 mm)
LI6123CFC	12	208	1	58	58	-	90	3	1" (25 mm)
LI6123CFD	12	208	3	33	33	33	50	8	1/2" (13 mm)
LI6123CFE	12	240	1	50	50	-	70	6	1/2" (13 mm)
LI6123CFF	12	240	3	29	29	29	40	8	1/2" (13 mm)
LI6123CFM	12	480	3	14.5	14.5	14.5	20	12	1/2" (13 mm)
LI6153CFC	15	208	1	72	72	-	90	3	1" (25 mm)
LI6153CFD	15	208	3	41.7	41.7	41.7	60	6	3/4" (19 mm)
LI6153CFE	15	240	1	62.5	62.5	-	90	3	1" (25 mm)
LI6153CFF	15	240	3	36.1	36.1	36.1	50	8	1/2" (13 mm)
LI6153CFM	15	480	3	18.1	18.1	18.1	30	10	1/2" (13 mm)
LI6183CFC	18	208	1	86.5	86.5	-	125	1	1-1/4" (32 mm)
LI6183CFE	18	240	1	75	75	-	100	3	1" (25 mm)
LI6183CFF	18	240	3	43.4	43.4	43.4	60	6	3/4" (19 mm)
LI6183CFM	18	480	3	21.7	21.7	21.7	30	10	1/2" (13 mm)
LI6243CFC	24	208	1	115.4	115.4	-	150	1/0	1-1/4" (32 mm)
LI6243CFD	24	208	3	66.7	66.7	66.7	90	3	1" (25 mm)
LI6243CFE	24	240	1	100	100	-	125	1	1-1/4" (32 mm)
LI6243CFF	24	240	3	57.8	57.8	57.8	90	3	1-1/4" (32 mm)
LI6243CFM	24	480	3	29.9	29.9	29.9	40	8	1/2" (13 mm)
LI6303CFC	30	208	1	144	144	-	200	3/0	1-1/2" (38 mm)
LI6303CFD	30	208	3	83.3	83.3	83.3	125	1	1-1/4" (32 mm)
LI6303CFE	30	240	1	125	125	-	175	2/0	1-1/2" (38 mm)
LI6303CFF	30	240	3	72.3	72.3	72.3	100	3	1" (25 mm)
LI6303CFM	30	480	3	36	36	36	50	8	1/2" (13 mm)

Wire size is based on THHN wire for branch circuit protection at .91 derate factor. Circuit breakers and fused disconnects are to be mounted remote and wired by contractor. Sizes are based on the 2002 NEC table 310-16. Conduit size based on conductors plus ground wire sizing per Table C1 from Appendix C.

Only 6 and 9 kW models can be field converted to single- or three-phase (open delta on 3-phase). Check wiring diagram supplied with the unit when converting the phase of a unit. Larger branch circuit required than for balanced 3-phase of equal kW. Balanced 3-phase available, consult factory.

NOTE: 250 kcmil maximum wire size for terminal block.

WARNING! Consult a licensed electrical contractor for proper electrical installation conforming to local electrical codes and the National Electrical Code (N.E.C.).

SPECIFICATIONS

Circuit Breaker and Fused Disconnect Switch Sizes — 36 to 57 kW

Model	kW	Volts	Phase	Amp Draw			Breaker or Fuse Size	Copper Wire Size	Conduit Size
				L1	L2	L3			
LI6363CFC	36	208	1	173	173	-	225	4/0	1-1/2" (38 mm)
LI6363CFD	36	208	3	100	100	100	125	1	1-1/4" (32 mm)
LI6363CFE	36	240	1	150	150	-	200	3/0	1-1/2" (38 mm)
LI6363CFF	36	240	3	86.7	86.7	86.7	125	1	1-1/4" (32 mm)
LI6363CFM	36	480	3	43.3	43.3	43.3	60	6	3/4" (19 mm)
LI6453CFD	45	208	3	125	125	125	175	2/0	1-1/2" (38 mm)
LI6453CFE	45	240	1	188	188	-	250	250 kcmil	2" (51 mm)
LI6453CFF	45	240	3	108	108	108	150	1/0	1-1/4" (32 mm)
LI6453CFM	45	480	3	54	54	54	70	4	1" (25 mm)
LI6543CFD	54	208	3	150	150	150	200	3/0	2" (51 mm)
LI6543CFF	54	240	3	130	130	130	175	2/0	1-1/2" (38 mm)
LI6543CFM	54	480	3	65	65	65	90	3	1" (25 mm)
LI6573CFD	57	208	3	158.4	158.4	158.4	200	3/0	2" (51 mm)
LI6573CFF	57	240	3	137.3	137.3	137.3	175	2/0	1-1/2" (38 mm)
LI6573CFM	57	480	3	68.6	68.6	68.6	90	3	1" (25 mm)

Wire size is based on THHN wire for branch circuit protection at .91 derate factor. Circuit breakers and fused disconnects are to be mounted remote and wired by contractor. Sizes are based on the 2002 NEC table 310-16. Conduit size based on conductors plus ground wire sizing per Table C1 from Appendix C.

NOTE: 250 kcmil maximum wire size for terminal block.

WARNING! Consult a licensed electrical contractor for proper electrical installation conforming to local electrical codes and the National Electrical Code (N.E.C.).

Capacity

Model	kW	40°F (22°C) Rise	70°F (39°C) Rise	Shipping Weight
LI663XXX Models	6	60 gph (227 lph)	34 gph (129 lph)	118 lbs. (54 kg)
LI693XXX Models	9	90 gph (341 lph)	52 gph (197 lph)	118 lbs. (54 kg)
LI6123XXX Models	12	120 gph (454 lph)	69 gph (261 lph)	120 lbs. (54 kg)
LI6153XXX Models	15	151 gph (572 lph)	86 gph (326 lph)	120 lbs. (54 kg)
LI6183XXX Models	18	181 gph (685 lph)	103 gph (390 lph)	120 lbs. (54 kg)
LI6243XXX Models	24	241 gph (912 lph)	138 gph (522 lph)	142 lbs. (64 kg)
LI6303XXX Models	30	301 gph (1139 lph)	172 gph (651 lph)	142 lbs. (64 kg)
LI6363XXX Models	36	361 gph (1367 lph)	206 gph (780 lph)	142 lbs. (64 kg)
LI6453XXX Models	45	452 gph (1711 lph)	258 gph (977 lph)	142 lbs. (64 kg)
LI6543XXX Models	54	542 gph (2052 lph)	310 gph (1174 lph)	142 lbs. (64 kg)
LI6573XXX Models	57	573 gph (2169 lph)	326 gph (1234 lph)	142 lbs. (64 kg)

NOTE: Storage capacity is 6 gallons (23 liters).

INSTALLATION

General

For the most effective operation, install the booster water heater as close as possible to the commercial dish machine. The location must have a solid foundation or strong table/counter construction along with being clean and dry. Adequate front clearance is required to allow for accessibility to the control compartment. Location must have adequate clearance to allow for inspection, testing, or replacement of temperature/pressure relief valve.

WARNING

ELECTRIC SHOCK HAZARD:

- This unit must be installed by qualified, trained installers. Installation must conform to all local electrical and plumbing codes. Check with your local plumbing and electrical inspectors for proper procedures and codes.
- Consult a licensed electrical contractor for proper electrical installation conforming to local electrical codes and the National Electrical Code (N.E.C.).
- Unit is not weatherproof. Locate unit indoors where ambient air temperature is a minimum of 70°F (21°C).
- Do not place aftermarket covers on or over booster water heater. Doing so can cause temperature and moisture build-up resulting in premature failure and electrical shock.

Install booster water heater as close as possible to the commercial dishwasher. Employ recirculation if distance between booster and commercial dishwasher exceeds National Sanitation Foundation (NSF) specifications of five (5) linear feet (1524 mm).

Install booster water heater in horizontal position with base parallel to the floor and inlet connection at the lowest point. If installing with legs, mount on floor. If installing with slide brackets, mount under dish table. **DO NOT** mount on walls or in ceiling. Unit must be accessible for service. Improper installation could create an unsafe condition.

Booster Heaters are shipped with most components pre-assembled. Care should be taken when unpacking shipping carton to avoid damage to unit and components enclosed. Components are shipped with the heater unit (see Figure 4).

1. Remove the unit from the carton.
2. Remove the information packet.
3. Remove tape and protective packaging from all surfaces of unit.
4. If the unit is equipped with legs, carefully lay the unit on its side and install the four legs as shown in Figure 2.

NOTICE

Do not lay unit on the side with the control panel. Damage to the unit could occur.

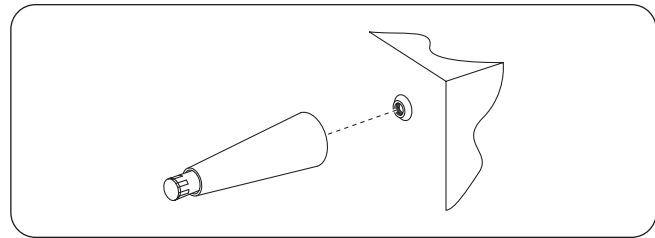


Figure 2. Installing the Legs

NOTE: If unit is not level, use an adjustable open-end wrench to adjust the foot of each leg until unit is level. Each leg is adjustable from 6" (152 mm) to 7" (178 mm).

5. If installing the unit with mounting brackets, use the following procedure:

WARNING

Make sure the dish table is strong enough to support the weight of the booster heater and water when installing with slide mounting brackets.

Follow standard welding safety and operational procedures when attaching sliderails to bottom of dish table.

- Space slide rails as shown below, and weld the rails to the bottom of the dish table.

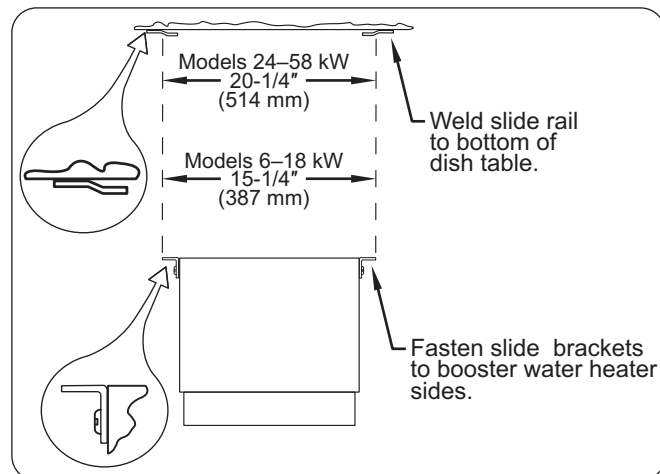
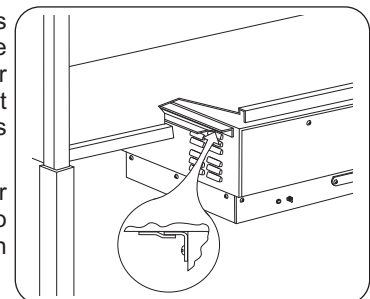


Figure 3. Attaching the Slide Rails to the Dish Table

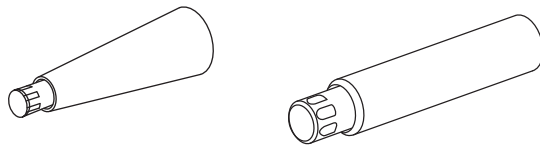
- Using the Bradford White slide brackets as a template, drill 1/8" (3 mm) holes into the sides of the heater jacket.

- Attach slide brackets to the sides of the booster water heater with 3/4 x 8 sheet metal screws supplied.

- Slide the booster water heater onto slide rails under dish table.



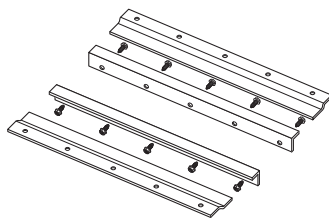
Legs



Plastic Leg

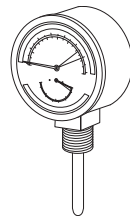
Stainless Steel Leg

Mounting Brackets with Hardware



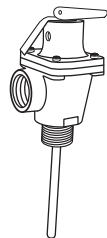
A set of mounting brackets or a set of legs are supplied with each booster water heater.

Temperature/Pressure Gauge



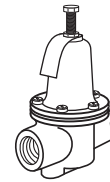
Two temperature/pressure gauges are supplied with all booster water heaters.

Temperature/Pressure Relief Valve



One temperature/pressure relief valve supplied with all booster heaters.

Pressure Reducing Valve



One pressure reducing valve with built-in bypass supplied with all booster water heaters.

Shock Absorber



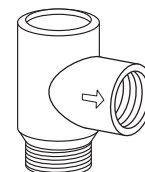
An optional shock absorber is available for all booster water heaters.

Blended Phosphate Water Treatment System



An optional blended phosphate water treatment system is available for all booster water heaters.

Back Pressure Relief Valve



An optional back pressure relief valve is available for all booster water heaters.

Figure 4. Components Shipped with the Magnum Series Commercial Electric Booster

INSTALLATION

Temperature/Pressure Relief Valves

For protection against excessive pressures and temperatures in the booster heater, install temperature/pressure protective equipment required by local codes. The temperature/pressure relief valve supplied with this booster water heater is constructed with brass working parts and heat resistant silicone seat discs.

WARNING

Temperature/pressure protective equipment should not be less than a combination temperature/pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of the production of this equipment and meets the requirements for Relief Valves and Automatic Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22-1979. The temperature/pressure relief valve must be marked with a minimum set pressure not to exceed the marked hydrostatic test pressure of the booster heater as noted on the unit specifications.

FOR INSTALLING COMBINATION TEMPERATURE/PRESSURE RELIEF VALVES IN ACCORDANCE WITH AMERICAN NATIONAL STD. Z21.22-1979. Combination temperature/pressure relief valves with extension thermostats must be installed so that the temperature-sensing element is immersed in the water within the top 6" (152 mm) of the tank. They must be installed either in the hot outlet service line or directly in a tank tapping. Combination temperature/pressure relief valves that do not have extension elements must be mounted directly in a tank tapping located within the top 6" (152 mm) of the tank, and shall be adequately insulated and located so as to assure isolation from the flue gas heat or other ambient conditions that are not indicative of stored water temperature. **TO AVOID WATER DAMAGE OR SCALDING DUE TO VALVE OPERATION, DRAIN PIPE MUST BE CONNECTED TO VALVE OUTLET AND RUN TO A SAFE PLACE OF DISPOSAL.** Discharge line must be as short as possible and be the same size as the valve discharge connection throughout its entire length. Drain line must pitch downward from the valve and must terminate between 1-1/2" (38 mm) and 6" (152 mm) above the floor drain where any discharge will be clearly visible. The drain line shall terminate plain, not threaded, with material serviceable for temperatures up to 250°F (121°C) or greater. Excessive length, over 30' (9144 mm), or use of more than four elbows can cause a restriction and reduce the discharge capacity of the valve. No shut-off valve shall be installed between the relief valve and tank, or in the drain line. Valve lever must be tripped periodically to assure that waterways are clear. This device is designated for emergency safety relief and shall not be used as an operating control. The valves are set to relieve at 150 psi (1034 kPa) or when water temperature reaches 210°F (99°C). Read tag on valve for additional information.

CAUTION

BURN HAZARD: Valves supplied with this booster water heater are designed for high temperature commercial operation. Do not substitute these valves with valves designed for domestic water heaters.

Do not use an anti-siphon or check valves on incoming water line.

Pressure Reducing Valve

CAUTION

If water supply pressure to the booster water heater inlet is over 20 psi (138 kPa) during flow, install a commercial-grade pressure reducing valve with built-in bypass for proper operation of dish machine rinse nozzles.

NOTE: The pressure reducing valve must be the type equipped with a high pressure bypass like the valve supplied with this booster water heater.

Proper operation of the commercial dish machine rinse nozzles requires that available water pressure at the rinse nozzle be between 15 and 25 psi (103 and 172 kPa) when the nozzle is operated. 20 psi (138 kPa) is recommended. If water pressure available to the booster water heater inlet is over 20 psi (138 kPa), a pressure reducing valve must be installed in the hot water supply line to the booster water heater and adjusted to deliver 20 psi (138 kPa) flow pressure.

The valve supplied with the unit has a built-in high pressure bypass that prevents excessive pressure build-up as the booster heats up. Final adjustment is required at the time of installation.

Temperature/Pressure Gauges

CAUTION

Bradford White requires that two temperature/pressure gauges be installed to assure proper operation. Install one in the supply line before the pressure reducing valve and one in the outlet line as close to the booster water heater as possible. This provides a visual check of the water temperature and pressure before and after the water heater.

NOTE: If a check valve is installed and cannot be removed install a back pressure relief valve set at 125 psi (862 kPa) on the incoming line between the pressure reducing valve and the inlet to the booster water heater. Discharge must be to open site drain (see Figure 7).

Blended Phosphate Water Treatment System (optional)

Bradford White recommends that the Blended Phosphate Water Treatment System be installed with unions on the incoming 3/4" water supply line after the pressure reducing valve and before the booster water heater.

Cartridges supplied have a usage rating of 100,000 gallons (378,541 liters) of water. To assure proper operation the cartridges must be replaced when expired.

NOTE: Product failure caused by liming or sediment buildup is not covered under warranty.

Plumbing Connections

Use the following procedures to connect the inlet and outlet water lines as well as inspect the system once the plumbing connections are complete.

WARNING

Do not connect an expansion tank of any type to booster water heater lines.

Use only plumbing material suitable for a minimum water temperature of 200°F (93°C). Materials used must meet National Sanitation Foundation (NSF) specifications and all local plumbing codes and regulations.

CAUTION

Do not connect booster water heater directly to a boiler or furnace coil or any other uncontrolled temperature source. The booster heater thermostat could be damaged causing unit to overheat.

Do not connect booster water heater to domestic (consumer) dish machines or other domestic utilized equipment. Hot water from booster heater may damage domestic equipment resulting in a hazardous condition.

NOTICE

Use dielectric couplings when connecting dissimilar metals, such as galvanized to copper. This will prevent electrolysis or premature plumbing damage.

DO NOT turn or adjust inlet water connection on Magnum Series booster water heaters. Doing so will change the internal water flow.

Do not back out or loosen any pipe fittings. Doing so may cause leaks.

Do not lay unit on the side with the control panel. Damage to the unit could occur.

Incoming water in excess of 3 grains of hardness per gallon (GPG) (0.75 grains of hardness per liter [GPL]) must be treated and softened before being supplied to booster heater(s). Water containing over 3 GPG (0.75 GPL) will decrease efficiency, increase energy use, and reduce the operating life of the unit through increased lime build-up. Product failure caused by liming or sediment buildup is not covered under warranty.

Do not use deionized or reverse osmosis (R.O.) treated water in booster water heaters. Damage to booster heater may occur.

NOTE: Product failure caused by liming or sediment buildup is not covered under warranty.

Inlet

(Refer to Figure 5, 6, or 7)

1. Connect the booster water heater inlet to a hot water supply line from the regular water heater. Water temperature from the regular water heater should be 110° or 140°F (43° or 60°C) and **should not exceed 160°F (71°C)**. Minimum temperature differential between inlet and outlet should never be less than 20°F (11°C).

NOTE: The red mark on the inlet and outlet water pipes of Magnum Series units must remain in the top most position.

2. Provide the inlet line with a shut-off valve, (a full opening gate or ball type), one temperature/pressure gauge, and the pressure reducing valve. Set pressure reducing valve at 20 psi (138 kPa) flow pressure.

NOTE: A 3/4" union and a drain valve are required for easy servicing.

NOTE: Be sure water flows through the pressure reducing valve in the proper direction. Check directional arrow. Valve will reduce pressure only during flow conditions.

NOTE: An optional back pressure relief valve is available for installation on the water inlet line when local plumbing codes require a check valve.

3. Install a temperature/pressure gauge in both the inlet and outlet lines. Install the temperature sensing bulb in the water stream. The gauge must be mounted upright (see Figures 8 and 9).

NOTE: Tighten gauge during installation by only turning the 1/2" brass nut. DO NOT turn the face of the gauge. Turning the face will cause inaccurate measurements.

INSTALLATION

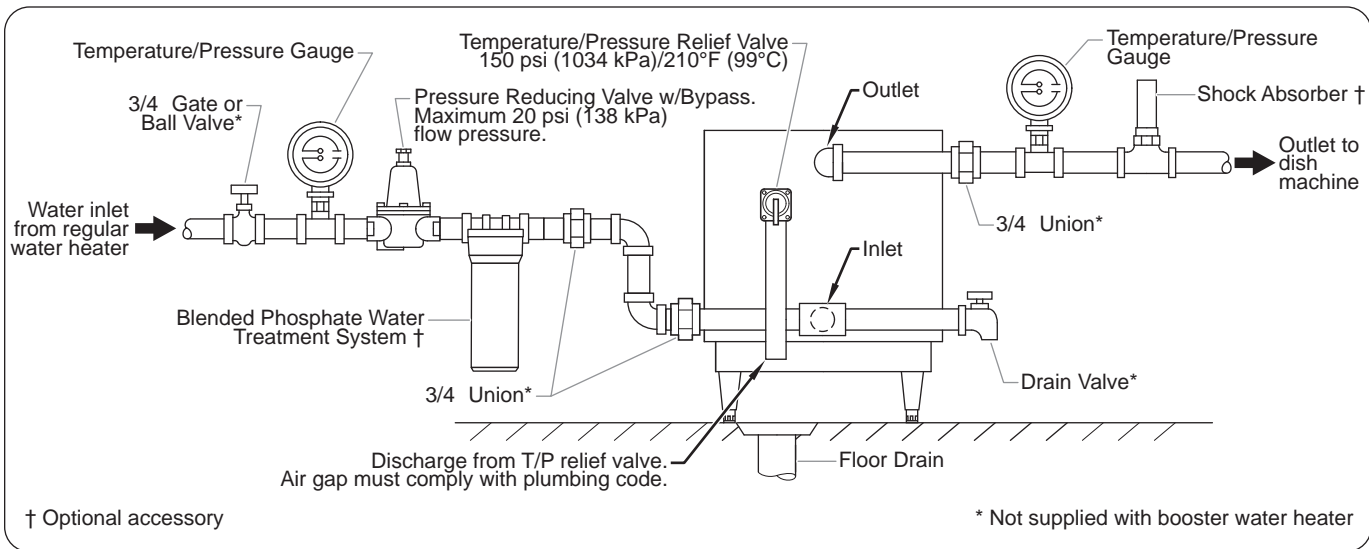


Figure 5. Plumbing Connections - Magnum Series 6-18 kW

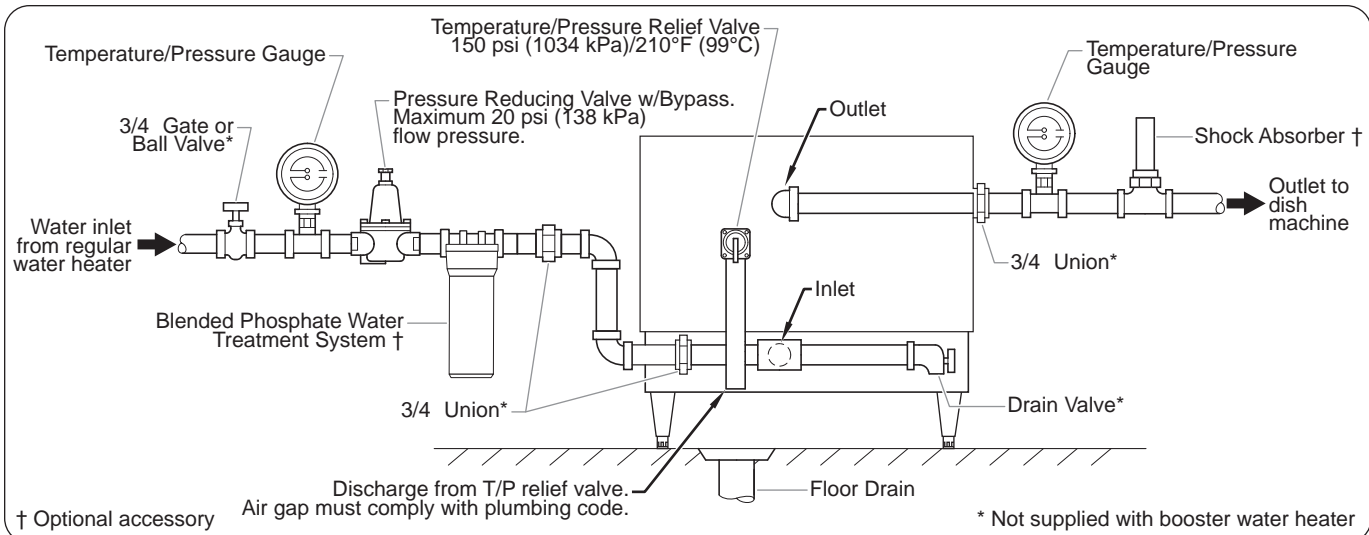


Figure 6. Plumbing Connections - Magnum Series 24-57 kW

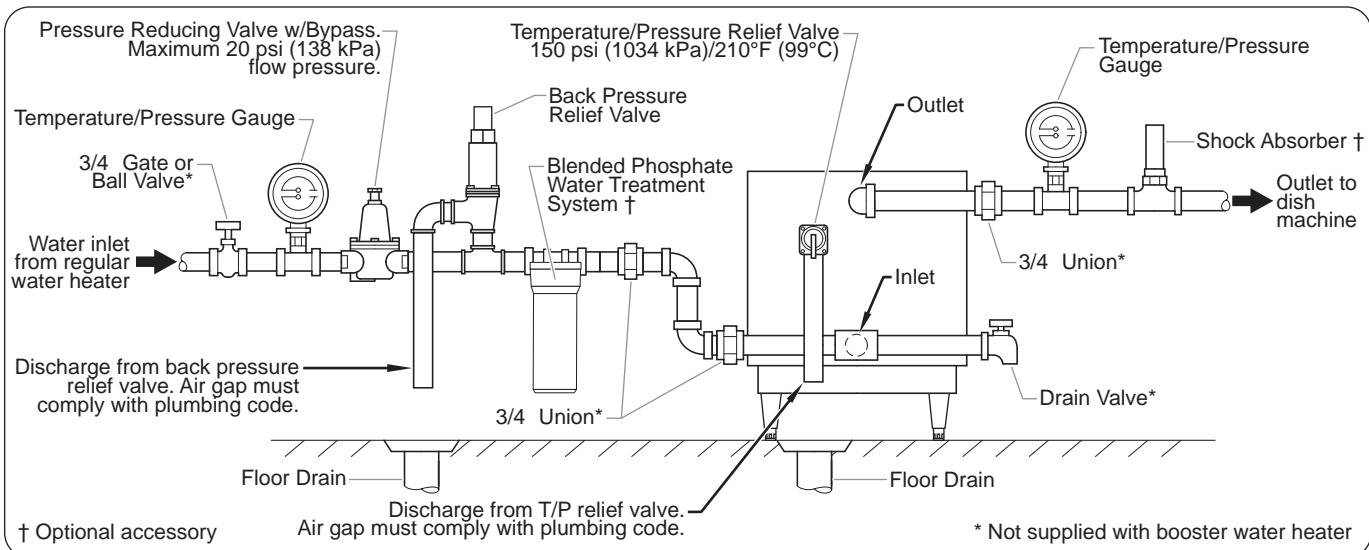


Figure 7. Booster Water Heater with Optional Back Pressure Relief Valve

Outlet

- Using a 3/4" union and piping, connect the booster water heater outlet to the commercial dish machine sanitizing rinse pipe connection.

NOTE: The red mark on the inlet and outlet water pipes of Magnum Series units must remain in the top most position.

NOTE: Make sure the connection is made to the final rinse and not to the wash tank.

- Install a temperature/pressure gauge in the outlet line. The temperature sensing element must be in the water stream and the gauge must be mounted upright. Water temperature at the outlet should be 185°–190°F (85°–88°C).

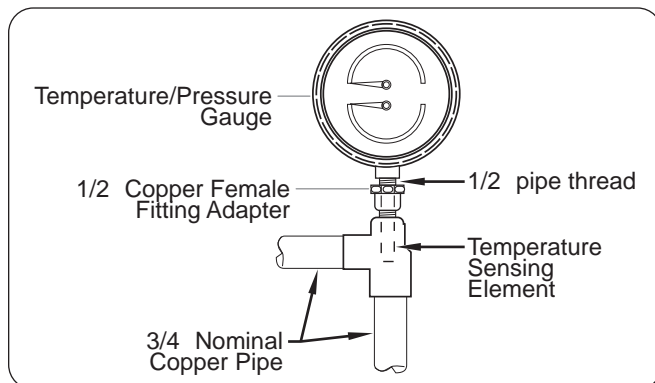


Figure 8. Recommended Temperature/Pressure Gauge Installation

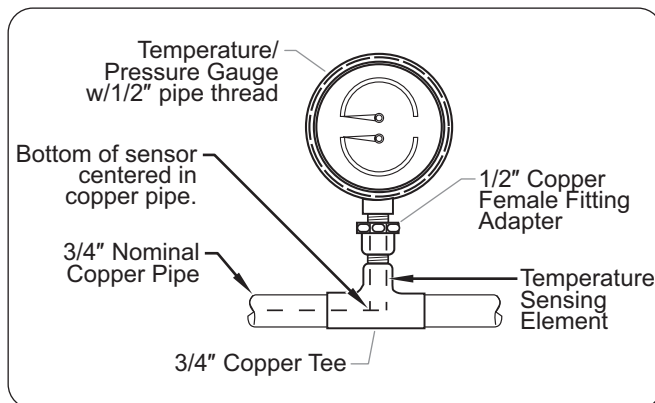


Figure 9. Alternate Temperature/Pressure Gauge Installation

NOTE: Bradford White recommends installing an optional shock absorber in the outlet line as close as possible to the commercial dish machine solenoid rinse valve. The shock absorber softens the water hammer caused by automatic dish machine valves.

Plumbing Installation Inspection

- Close drain pipe shut-off valve and fill booster water heater with water.
- Check all pipe connections for leaks.
- Make sure the temperature/pressure relief valve discharge is not blocked.
- Vent air from the booster tank before turning on the unit by opening the temperature/pressure relief valve as well as running the dish machine through several cycles.

CAUTION

DO NOT turn on power to the booster water heater until tank has been filled with water and all air has been vented through dish machine rinse nozzle. The heating elements will burn out in seconds if operated when they are not immersed in water.

Electrical — All Sizes and Voltages

General

Bradford White Electric Booster Water Heaters are available for operation on standard power systems. Check the identification decal for the proper power supply.

WARNING

ELECTRIC SHOCK HAZARD:

- Turn power OFF at disconnect switch/circuit breaker and allow unit to cool before performing any maintenance or cleaning.
- Consult a licensed electrical contractor for proper electrical installation conforming to local electrical codes and the National Electrical Code (N.E.C.).

NOTICE

Connect electric booster water heater to the same power supply as indicated on the specification decal only. Units connected to an incorrect power supply voids the product warranty and will damage the equipment.

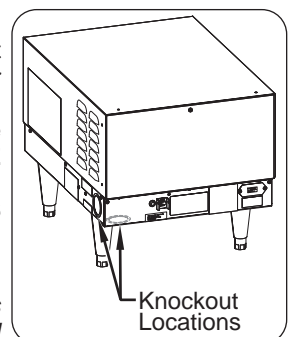
All internal electrical connections have been made at the factory. See the "Circuit Breaker and Fused Disconnect Switch Sizes" charts in the SPECIFICATIONS section for supply wire size, fuse, breaker, and conduit recommendations. Consult local codes for verification and compliance.

Electrical Connections

- Remove the front jacket cover screws. Ease the cover forward and upward. The control box is under the front hinged jacket cover.
- Locate the heater terminal or fuse block(s) inside the unit.

NOTE: See the "Circuit Breaker and Fused Disconnect Switch Sizes" charts for proper connections and wire size.

- Bring power leads from a properly sized disconnect switch or circuit breaker through the knockout provided on the unit, and connect to the terminal or fuse block(s). **USE COPPER WIRE ONLY. TIGHTEN CONNECTIONS PROPERLY TO A MINIMUM OF 40 INCH POUNDS.**



NOTE: Due to the rigors of transportation all connections should be checked for tightness before booster water heater is put into operation.

- A grounding lug is provided near the supply terminals. An equipment grounding conductor must be properly connected to it.
- Replace and secure the front jacket cover.

OPERATION

General

Use the following procedures to operate the Magnum Series Commercial Electric Booster water heater.

⚠ WARNING

Read all safety messages in the Important Safety Information section before operating this equipment.

DO NOT turn on power to the booster water heater until tank has been filled with water and all air has been vented through dish machine rinse nozzle. The heating elements will burn out in seconds if operated when they are not immersed in water.

Startup

1. Close the drain pipe shut-off valve.
2. Open the shut-off valve to primary water supply. The water temperature at the inlet should be 110° to 140°F (43° to 60°C) and should not exceed 160°F (71°C).

NOTE: Minimum temperature differential between inlet and outlet should never be less than 20°F (11°C).

3. When the booster tank is filled with water, vent all air from the tank before turning on the unit. To vent the booster tank:
 - Open the temperature/pressure relief valve.
 - Run the dish machine through several cycles to vent air through the rinse nozzles.
4. Check all plumbing connections for leaks.
5. Check the temperature/pressure relief valve discharge opening to be sure it is not blocked and no scale or other foreign matter has reduced the size of the opening.

⚠ CAUTION

BURN HAZARD:

- Water in unit is very hot. Wear protective gloves and proper attire when operating to avoid injury.
 - Some exterior surfaces on unit will get hot. Avoid unnecessary contact with unit.
6. Turn on the electrical supply to the booster heater.
 7. Move the Power ON/OFF switch to the ON position. The indicator light will turn on.

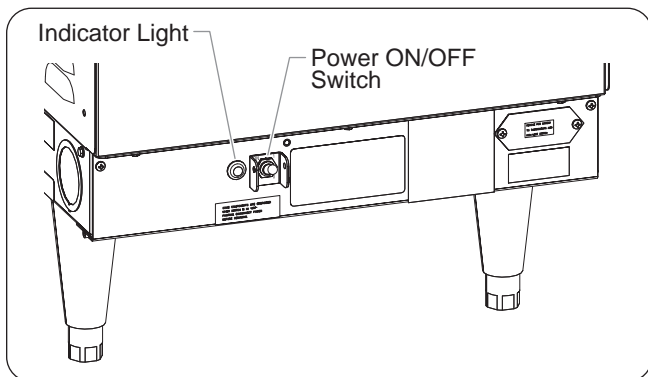


Figure 10. Control Panel

8. When the booster water heater has had sufficient heating time, operate the rinse cycle and check the water temperature and pressure readings on the gauges.

Water temperature at the booster outlet should be 185°–190°F (85°–88°C) and flow pressure should be 20 psi (138 kPa) maximum.

NOTE: Outlet water temperatures can be adjusted for low-temperature dish machine applications. See the Maintenance section for thermostat adjustment procedure.

⚠ WARNING

Units are equipped with a high temperature limit safety switch that will shut off power if the unit overheats. **Contact an Authorized Service Agent if high temperature limit safety switch cannot be reset or continues to trip.**

Shutdown

Under normal and regular operation, Bradford White recommends that the unit be turned on at all times.

If the booster water heater will not be used for an extended period of time or will be exposed to freezing conditions it should be drained to prevent damage to the unit.

1. Move the Power ON/OFF switch to the OFF position.
2. Disconnect power supply to the booster water heater.
3. Close the inlet water supply line shut-off valve to the booster water heater.

NOTICE

ALWAYS drain booster water heater with power to the unit off or element burnout could occur.

4. Open the drain shut-off valve and drain all water from the booster water heater tank.

General

Bradford White Magnum Series Commercial Electric Booster water heaters are designed for maximum durability and performance, with minimum maintenance.



ELECTRIC SHOCK HAZARD:

- Turn power OFF at disconnect switch/circuit breaker and allow unit to cool before performing any maintenance or cleaning.
- This unit must be serviced by qualified personnel only. Service by unqualified personnel may lead to electric shock or burn.
- Use only Genuine Bradford White Replacement Parts when service is required. Failure to use Genuine Bradford White Replacement Parts will void all warranties and may subject operators of the equipment to hazardous electrical voltage, resulting in electrical shock or burn. Genuine Bradford White Replacement Parts are specified to operate safely in the environments in which they are used. Some aftermarket or generic replacement parts do not have the characteristics that will allow them to operate safely in Bradford White equipment.

This unit has no “user-serviceable” parts. If service is required on this unit, contact an Authorized Service Agent or the Bradford White Service Department.

Thermostat Adjustment

The thermostat is factory calibrated to produce temperatures of 185°–190°F (85°–88°C). If adjustment or recalibration is required use the following procedure.

NOTE: Low temperature dish machines require the thermostat to be adjusted to 140°–150°F (60°–66°C).

1. Remove the access cover.

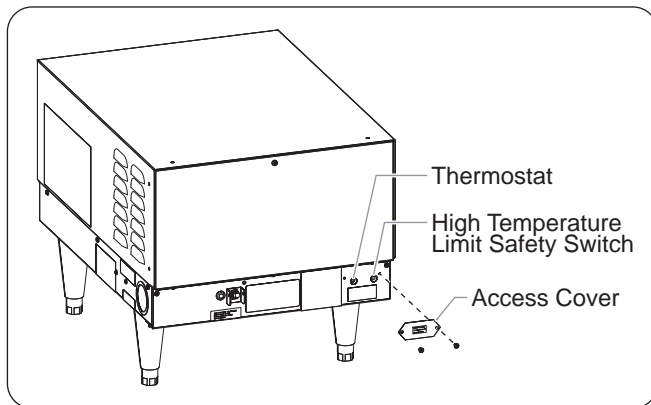


Figure 11. Access Cover for Thermostat and High Temperature Limit Safety Switch

2. Adjust the thermostat in the desired direction.
 - To **lower** the temperature setpoint, turn the outer adjustment screw counterclockwise.
 - To **raise** the temperature setpoint, turn the outer adjustment screw clockwise.

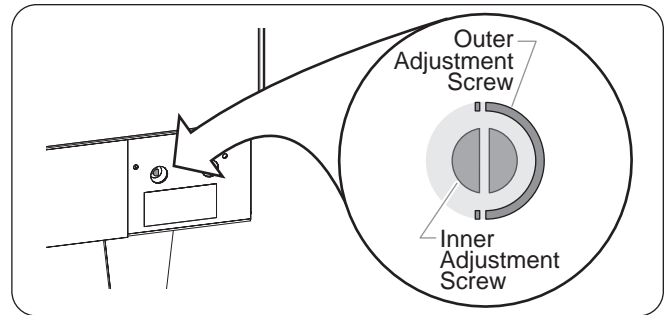


Figure 12. Thermostat Adjustment

NOTE: 1/6 turn of the outer screw equals 12°F (6.7°C).

If recalibration is necessary, with the outer screw at high stop turn inner adjustment screw clockwise to raise the set point.

NOTE: 1/6 turn of the inner screw equals 8°F (4.4°C).

Temperature/Pressure Relief Valve

The temperature/pressure relief valve lever must be operated at least once a year to ensure that waterways are clear. Certain naturally occurring mineral deposits may adhere to the valve, blocking waterways and rendering it inoperative. When the lever is operated, hot water will discharge from the attached discharge line if waterways are clear. In addition to annual operation of the valve lever, the condition of the temperature/pressure relief valve must be inspected every two to four years by a licensed plumber or qualified service technician.

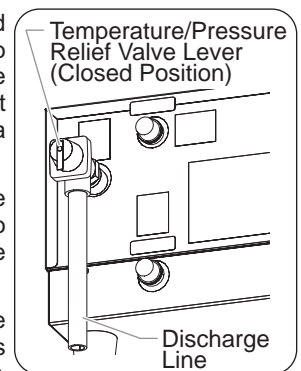


Inspect combination temperature/pressure relief valve at least once every two to four years, depending on local water conditions. Contact a licensed plumber or qualified service technician for inspection. Replace valve, if necessary. DO NOT attempt to self-inspect valve.

BURN HAZARD: Water in unit is very hot. Wear protective gloves and proper attire when operating to avoid injury.

Use the following procedure to test the temperature/pressure relief valve.

1. Make sure a properly installed discharge line is connected to the relief valve. The discharge line must direct the flow of hot water from the valve to a proper place of disposal.
2. Pull up slightly on the relief valve lever. The lever is connected to a strong spring, so it will take some force to move the lever.
 - If water flows freely from the discharge line, the valve is clear and operating properly. Release the lever down into the closed position (vertical).
 - If water does not flow freely from the discharge line, the valve is obstructed and must be replaced immediately. Release the lever, turn off the booster water heater, and contact a trained, licensed plumber to replace the valve.



NOTE: If dripping or discharge occurs when the relief valve lever is in the closed position (vertical), turn off the booster water heater and contact a licensed plumber immediately. Discharge may indicate that an unsafe temperature or pressure condition exists.

MAINTENANCE

High Temperature Limit Safety Switch

Bradford White Commercial Electric Booster water heaters are equipped with a manually reset high temperature limit safety switch. If the temperature of the water in the heater exceeds 210°F (99°C) the safety switch will shut off the power. The switch must be reset manually by pushing the red button.

Use the following procedure if the high temperature limit safety switch needs to be reset.

1. Remove the access cover (see Figure 11).
2. Push the red reset button on the high temperature limit safety switch.

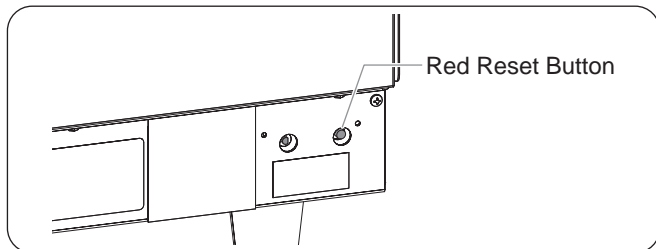


Figure 13. High Temperature Limit Safety Switch

3. If tripping repeats, call an Authorized Service Agent.

Blended Phosphate Treatment System (optional)

The Blended Phosphate Water Treatment System dispenses a small amount of polyphosphate into the water before the water enters the booster water heater. The mineral molecules in the water, which have a positive charge, are attracted to the negative charge of the polyphosphate. The mineral molecules are unable to join together, so scale is unable to form. Use the following procedure to replace a blended phosphate cartridge.

1. Shut off electrical power to the booster water heater.
2. Shut off the inlet water supply and open drain shut-off valve to remove water in piping.
3. Loosen canister using wrench attached.
4. Remove canister and discard depleted cartridge.
5. Using a clean damp cloth, wipe interior of canister clean.

NOTE: Make sure the o-ring seal is placed properly in canister.

6. Reverse procedure to reinstall.

TROUBLESHOOTING GUIDE

General



ELECTRIC SHOCK HAZARD:

- Turn power OFF at disconnect switch/circuit breaker and allow unit to cool before performing any maintenance or cleaning.
- This unit must be serviced by qualified personnel only. Service by unqualified personnel may lead to electric shock or burn.

IMPORTANT! Many times when a booster water heater does not appear to be functioning properly, the fault is not with the booster water heater itself but with factors outside the heater. Before proceeding with the troubleshooting charts, perform the following steps first.

1. Check the temperature of the water feeding into the booster tank. It must be 110° to 140°F (43° to 60°C) depending on the heating capability of the unit. The inlet water supply must be in sufficient quantity to hold its temperature throughout the dishwashing operation.
2. If incoming water exceeds 20 psi (138 kPa), a pressure reducing valve must be installed.
3. If the wash tank of the dish machine is filled through the booster water heater, this will use up all of the 180°F (82°C) water in storage. Sufficient time must be allowed to reheat the water in storage before starting the dishwasher.

4. Booster water heater voltage must be correct for the voltage available. Check nameplate on the booster water heater for full information.
5. Water pressure at the inlet to the booster water heater must be adequate for proper operation of the rinse cycle of the dish machine, not to exceed 20 psi (138 kPa). Check with dish machine manufacturer for specific details.
6. The breakers or fuses MUST be sized properly.
7. Be sure that the temperature/pressure relief valve is one supplied by Bradford White and is installed properly.
8. A check valve should not be installed ahead of the booster.

NOTE: If a check valve is installed and cannot be removed, install a back pressure relief valve set at 125 psi (862 kPa) on the incoming line between the pressure reducing valve and the inlet to the booster water heater. Discharge must be to open site drain.

9. Primary water heater temperature should not exceed 160°F (71°C).

TROUBLESHOOTING GUIDE

Symptom	Probable Cause	Corrective Action
Water reaches 180°F (82°C) but does not last through the entire dishwasher operation.	Low incoming water temperature.	Incoming water temperature must be adequate for booster size. Increase incoming water temperature.
	Incoming water temperature drops.	Primary water supply is not adequate to provide correct temperature in sufficient quantities. Increase supply of primary hot water.
	Flow pressure is too high.	Higher pressure uses an excessive quantity of hot water. Adjust flow pressure to 20 psi (138 kPa).
	Booster water heater may be undersized.	Booster water heater must be sized properly for incoming water temperature and rinse requirements of the dish machine.
	Incorrect voltage.	Check voltage on heater serial plate and make sure supplied voltage matches. A 240 V booster water heater operating on 208 V reduces wattage to 76% of the normal output.
The booster heater does not heat at all or only delivers water at 120°–150°F (49°–66°C).	Unit may have been energized without water (dry fired).	This will cause the elements to burn out quickly. Replace the element(s).
	Fuses may be blown or circuit breaker tripped.	Check for proper fuse sizing. Replace fuses. Check/reset circuit breaker.
	Over-current fuses may be blown.	Contact Authorized Service Agent or Bradford White for assistance.
	Temperature setting out of calibration or inoperable.	Temperature setting should be maximum of 190°F (88°C).
	Contactors do not pull in.	Contact Authorized Service Agent or Bradford White for assistance.
	High limit switch may be tripped or defective.	Reset switch. If switch continues to trip or cannot be reset contact an Authorized Service Agent.
	Transformer not working properly.	Contact Authorized Service Agent or Bradford White for assistance.
	Low water cutoff inoperable, contacts do not close.	Contact Authorized Service Agent or Bradford White for assistance.

TROUBLESHOOTING GUIDE

Symptom	Probable Cause	Corrective Action
Water at dish machine is not at the proper temperature.	Gauge(s) not working properly.	Check temperature of water with a thermometer to be certain gauges are working correctly. If not, replace gauge(s).
	Thermostat set too low.	Adjust or recalibrate. If thermostat will not recalibrate properly, replace it.
	Booster heater has more than 5 linear feet (1524 mm) of water pipe to the dishwasher, causing the water to cool off inside the pipe.	If located farther than 5 linear feet (1524 mm), pipes should be wrapped in insulation, and/or a recirculating system installed.
Heating elements burn out.	Tank inadvertently drained leaving elements in a dry condition.	Make sure tank is full of water at all times. Contact Authorized Service Agent or Bradford White for assistance.
	Lime buildup in tank causing elements to split and burn out.	Clean or delime tanks periodically. A water softener or blended phosphate treatment system may be required.
Relief valve dribbles.	No pressure reducing valve installed or incorrect valve installed causing pressure build-up inside booster tank.	A pressure reducing valve with high pressure bypass must be installed in the incoming water line to allow water to expand back into the feed line.
	Bypass in pressure reducing valve may be blocked.	Clean bypass or replace with new valve with built in bypass.
	Check valve or anti-siphon valve installed in the feed line.	Remove check valve or anti-siphon valve to allow for water expansion or install a back pressure relief valve on the incoming water line.
Relief valve opens.	Unit is overheating.	Thermostat may be set too high or is sticking. Recalibrate or replace the thermostat.
	Contactors may be sticking in closed position not allowing unit to cycle off.	Contact Authorized Service Agent or Bradford White for assistance.
High temperature limit trips.	Temperature limit set too low.	If booster water heater is not overheating, Contact Authorized Service Agent or Bradford White for assistance.
	Thermostat set too high.	Adjust or recalibrate to proper temperature.
	Incoming water temperature too high causing nuisance tripping of high temperature limit switch.	Incoming water temperature should not be higher than 160°F (71°C).
Chattering contactor or low water cutoff circuit board.	Loose connections or wire connection has insulation under crimp.	Contact Authorized Service Agent or Bradford White for assistance.
	Low voltage.	Contact Authorized Service Agent or Bradford White for assistance.
	Probe may be fouled.	Contact Authorized Service Agent or Bradford White for assistance.
	Contactors(s) may be bad.	Contact Authorized Service Agent or Bradford White for assistance.

Stainless Steel Adjustable Legs

1. Carefully place the unit on its side.

NOTICE

Do not lay unit on the side with the control panel. Damage to the unit could occur.

2. Thread the adjustable legs into the existing leg holes on the bottom of the unit.
3. After all legs are secure, return the unit to the upright position.

NOTE: If unit is not level, use an adjustable open-end wrench to adjust the foot of each leg until unit is level. Each leg is adjustable from 6" (152 mm) to 7" (178 mm).

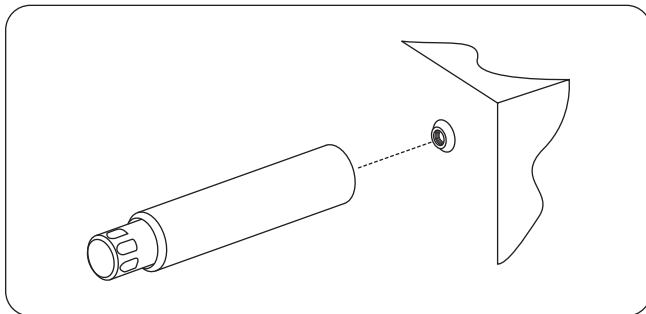


Figure 14. Optional Stainless Steel Adjustable Legs

Floor Mounting Hardware

Stainless steel adjustable legs with deck mounting flange are available for securing the booster heater to the floor.

Shock Absorber

The shock absorber installed between the booster and the commercial dish machine reduces water hammer induced by rapidly operating valves. The water hammer can cause damage to the equipment.

Blended Phosphate Water Treatment System

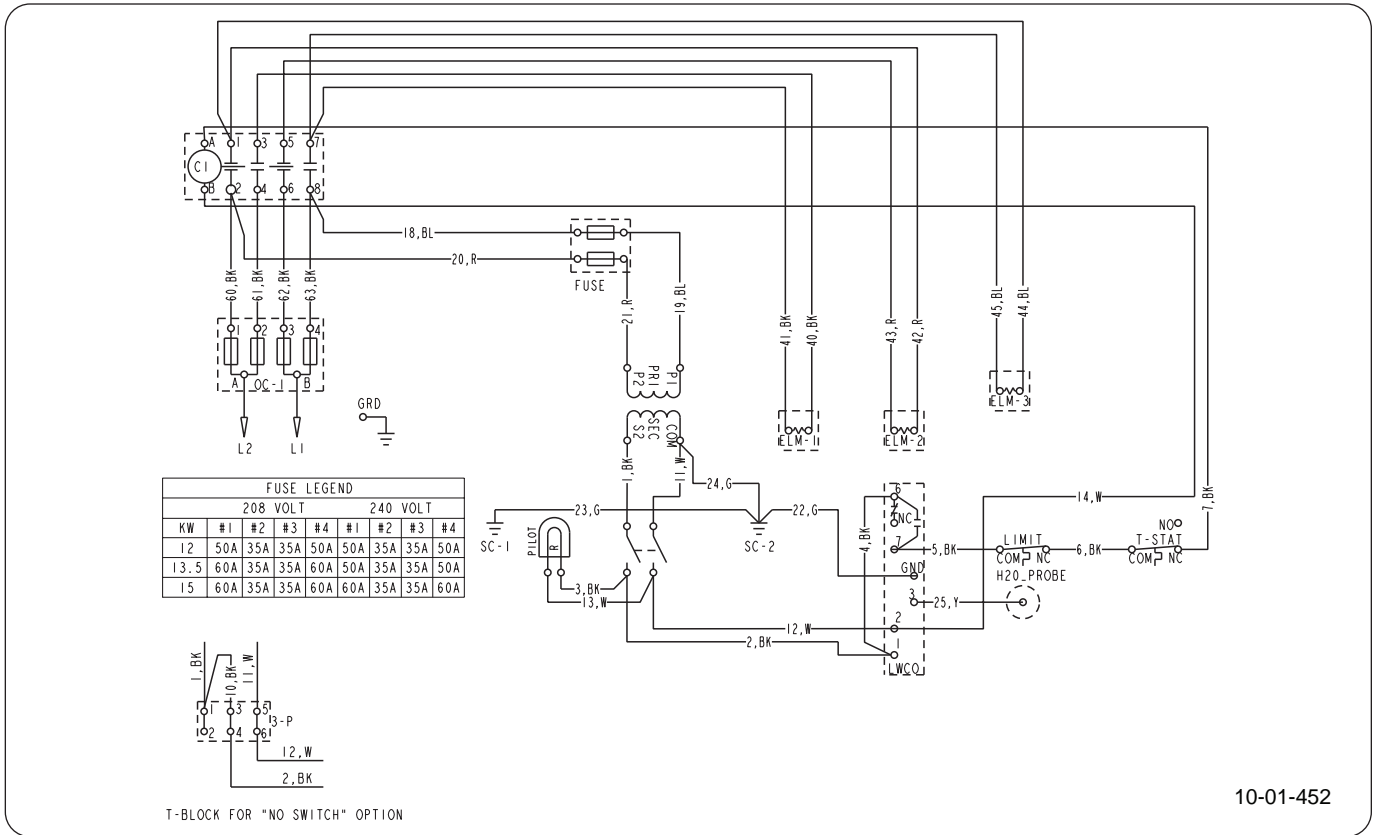
The Blended Phosphate Water Treatment System is installed before the booster water heater and reduces mineral scale build-up by introducing a measured amount of polyphosphate into the water.

Bradford White recommends that the Blended Phosphate Water Treatment System be installed with unions on the incoming 3/4" water supply line after the pressure reducing valve and before the booster water heater.

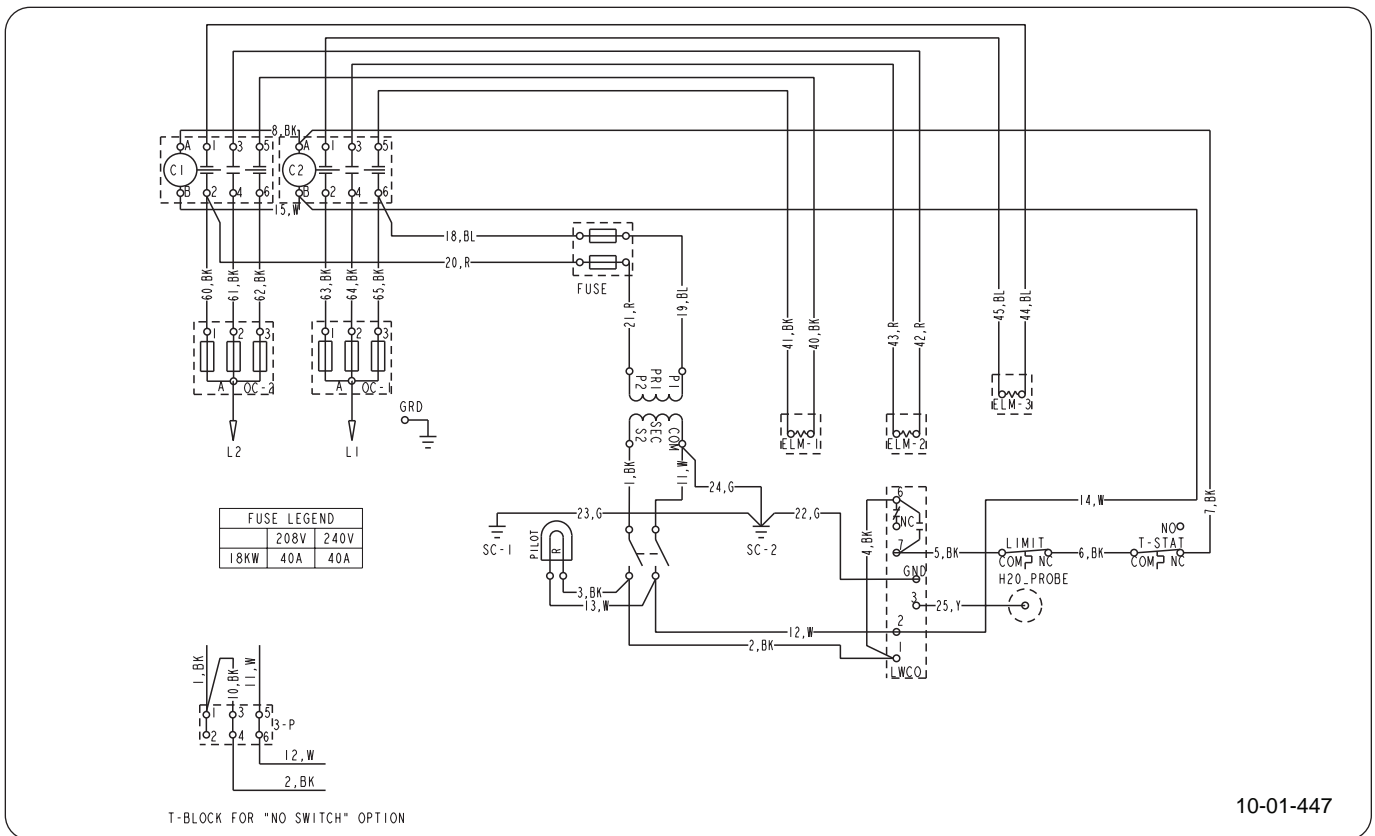
Cartridges supplied have a usage rating of 100,000 gallons (378,541 liters) of water. To assure proper operation the cartridges must be replaced when expired.

NOTE: Product failure caused by liming or sediment buildup is not covered under warranty.

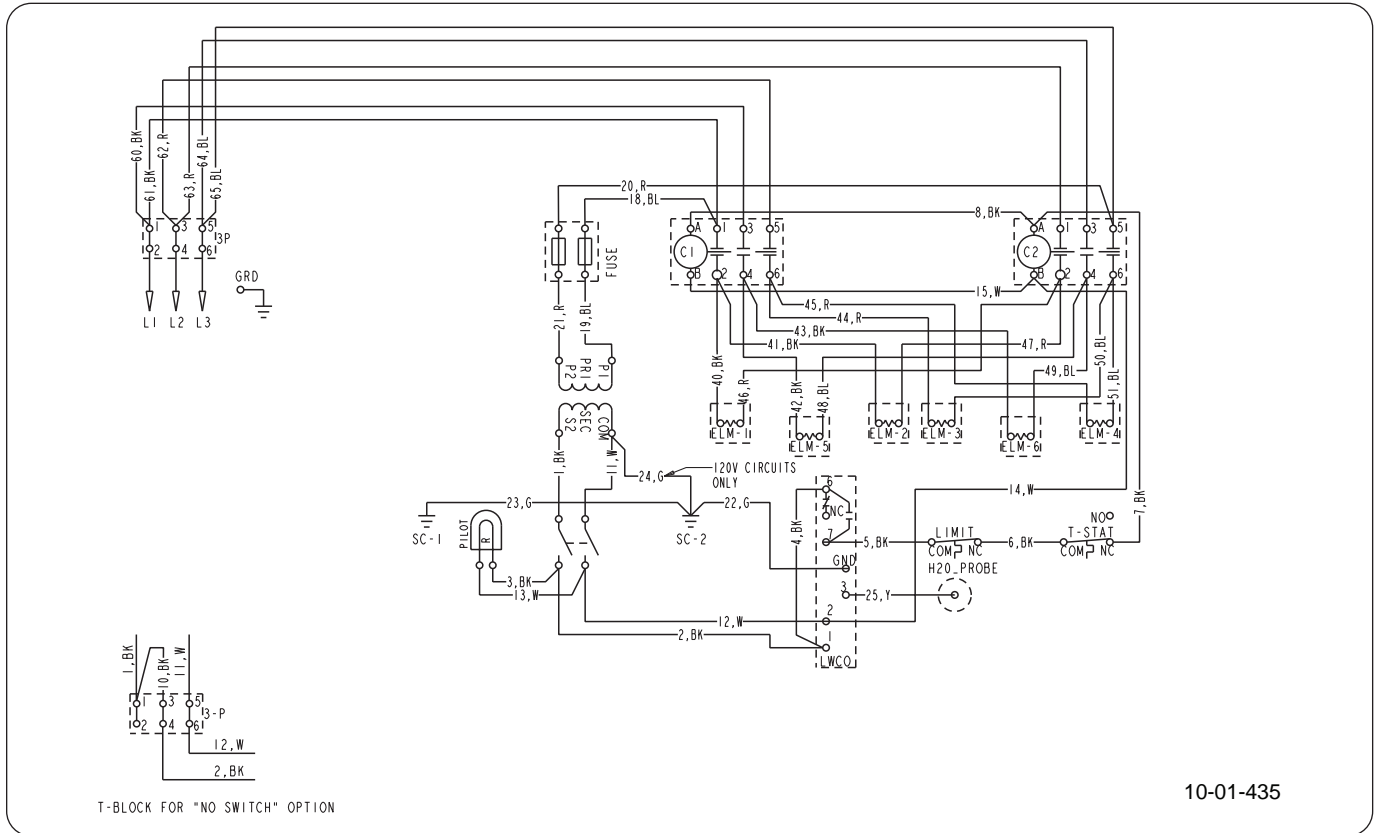
12 – 15 kW Wiring Diagram, 208 and 240 V, Single-Phase



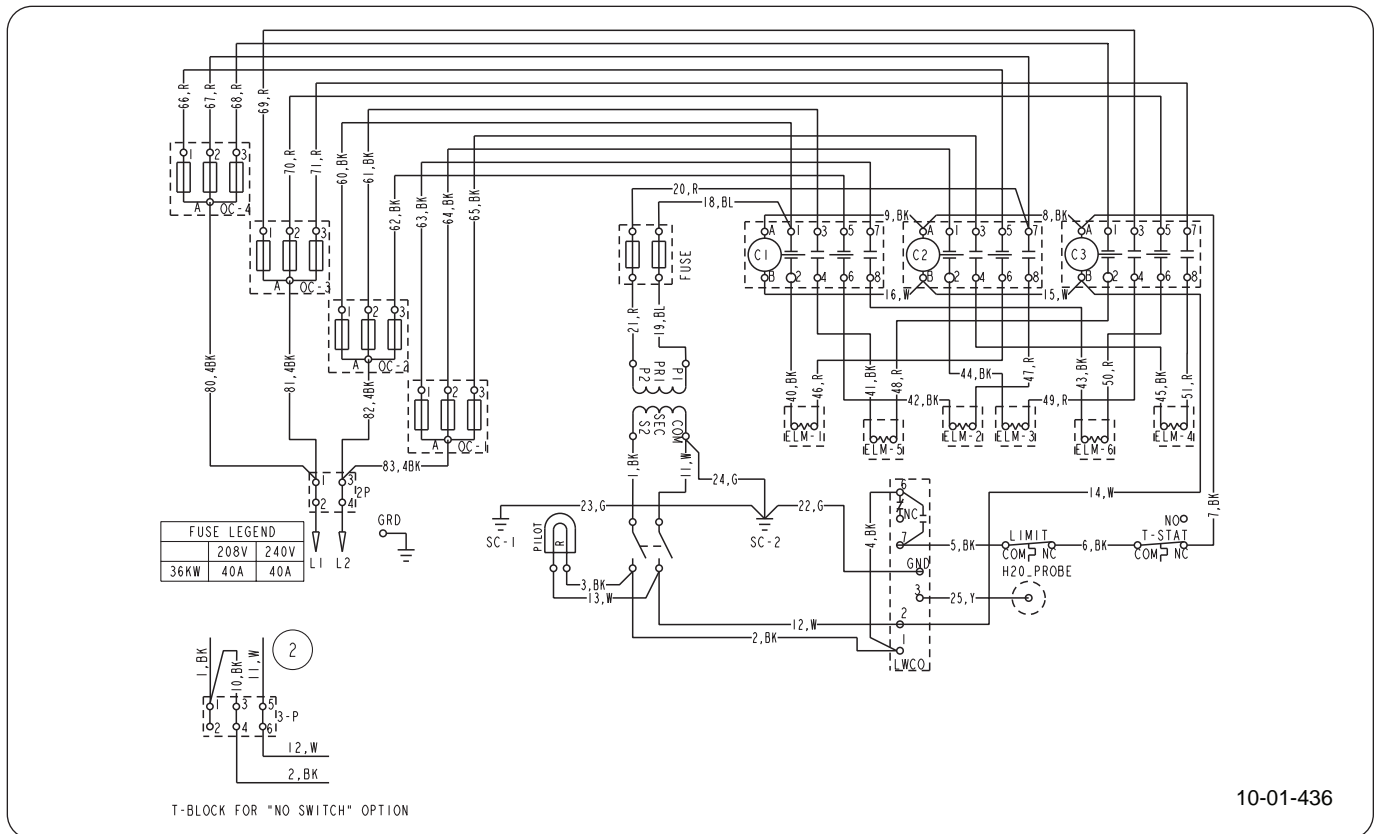
18 kW Wiring Diagram, 208 and 240 V, Single-Phase



24 – 36 kW Wiring Diagram, 480 V, Three-Phase

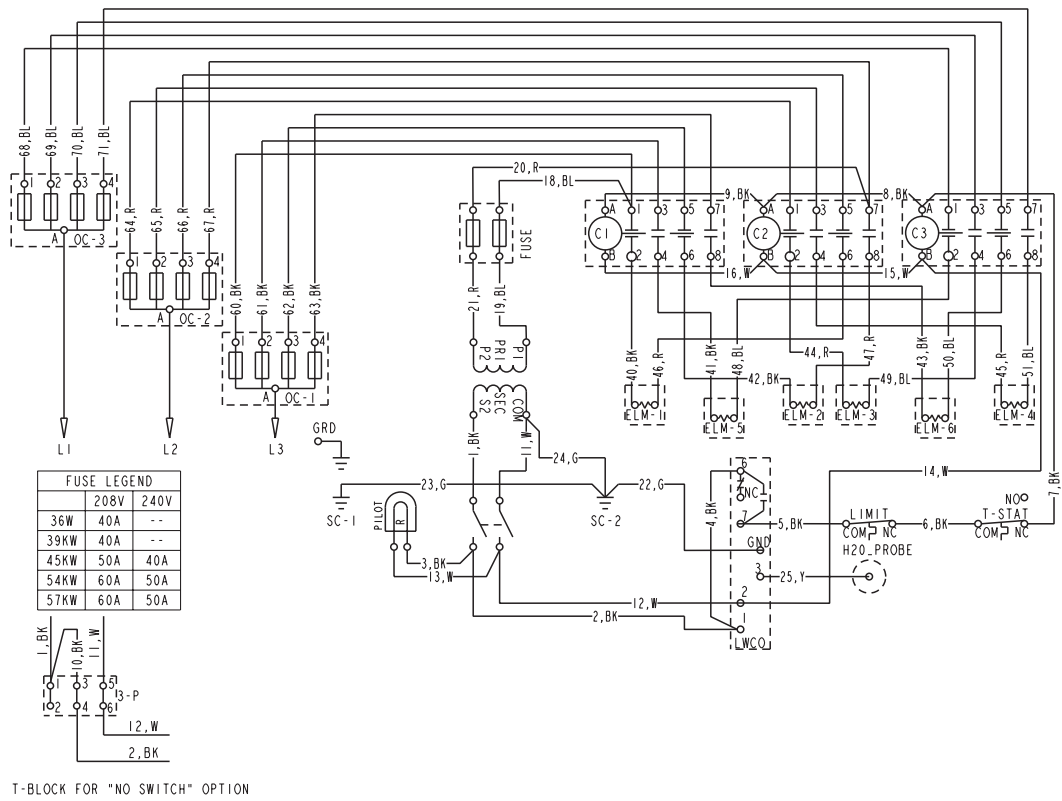


36 kW Wiring Diagram, 240 V, Single-Phase

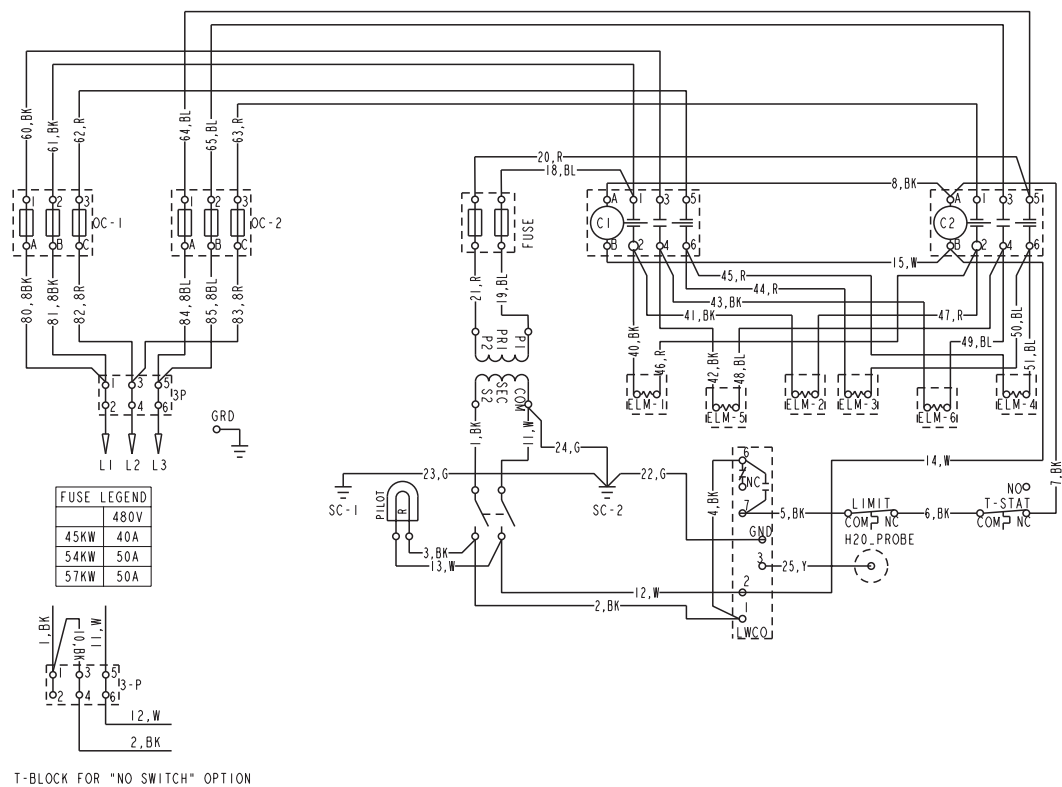


WIRING DIAGRAMS

36 – 57 kW Wiring Diagram, 208 and 240 V, Three-Phase



45 – 57 kW Wiring Diagram, 480 V, Three-Phase



LIMITED COMMERCIAL WATER HEATER WARRANTY

WHAT DOES THIS LIMITED WARRANTY COVER?

This limited warranty covers both the 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 heater 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 nonapproved 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 one (1) year on Parts, PLUS four (4) additional years on the tank only.

WHAT IS THE DURATION OF THE IMPLIED WARRANTY?

ANY IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY IMPOSED ON THE SALE OF THE WATER HEATER 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.

WHAT WILL WE DO TO CORRECT PROBLEMS?

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

1. Provide a replacement water heater of our manufacture, (or at our option) repair any unit which develops a leak in the tank within the tank warranty period. If government regulations require the replacement water heater to have features not found in the defective water heater, 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 heater, 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 heater without complete model/serial number.

HOW DO YOU GET WARRANTY ASSISTANCE?

Upon discovering a defect or problem, you should:

1. Contact either the installer or dealer, or
2. Contact us--

BRADFORD WHITE CORPORATION
WARRANTY SUPPORT GROUP
200 LAFAYETTE STREET
MIDDLEVILLE, MI 49333
(800) 531-2111

CALIFORNIA RESIDENTS CALL 1-800-538-2020
Please have model number and serial number ready.

Continued...

† Restrictions are not applicable to implied warranties in California. See "Special State Provisions" on next page.

LIMITED COMMERCIAL WATER HEATER WARRANTY (CONTINUED)

WHAT SHOULD YOU DO TO KEEP THE WARRANTY IN EFFECT?

To facilitate warranty assistance, you should:

1. Follow all instructions enclosed with the product.
2. Retain all bills of sale or receipts for proof of installation, etc.
3. Contact your installer, dealer or our Warranty Department 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.



Ambler, PA 19002
Technical Service 800.334.3393
Service Parts 800.538.2020
Warranty Service 800.531.2111

www.bradfordwhite.com