

A. O. SMITH
WATER HEATER

INSTALLATION & INSTRUCTION MANUAL

A. O. SMITH
WATER HEATER
A.O.SMITH WATER HEATER CO.,LTD

EES ELJF Electric Storage Water Heater
A.O.SMITH WATER PRODUCTS COMPANY.

Congratulations on your purchase of a new, high quality water heater from A.O.Smith. Your heater is equipped with technology and features that only a company with over sixty years of experience can deliver. With the proper care, your heater will deliver comfortable hot water for years to come.

We are concerned about your safety and ask you to read this manual thoroughly and pay close attention to all of the warning and information contained inside. Be sure to keep these instructions for future reference.

Thank you for buying an A.O.Smith brand water heater.

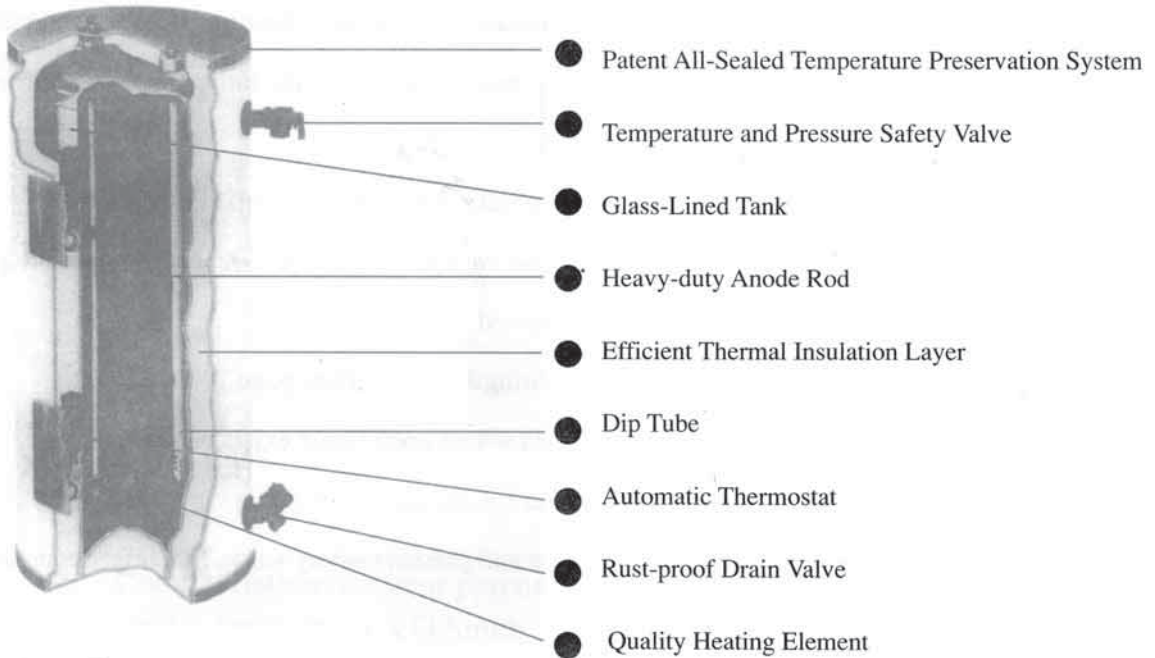
General Safety Information

- Prior to electric water heater selection or installation, check out if the capacity of your supplying power and in-door wiring meets your water heater ratings. See the rating plate on your heater for detailed specifications.
- Ground Fault Circuit Interrupter (or GFCI breaker) must be installed and applied.
- The heater must be well grounded. Do not use ungrounded heater. Connecting grounding lead to neutral line or tap water pipe is NOT allowed.
- Electrical connection must comply with Wiring Diagram. (See page 7, page 8)
- Electric heater cannot be installed in an area where open flame exists nearby.
- Do not apply direct welding on water heater for piping connection.
- This appliance is equipped with temperature and pressure safety valve. For safety concern, do not attempt to relocate or block it.
- This manual must be read thoroughly before turning on power supply. Operation and use must comply with all related instructions strictly.
- Be aware that hot water over 52°C may cause scalding injury. Hot water must be mixed with cold water for safe use.
- If the water heater has been subject to flooding, it must be checked by a qualified service technician prior to re-use.
- All important parts are protected by electrical and thermal insulation for safety concern.

Important

This manual applies to the installation, operation and maintenance of storage electric water heater. Read this manual thoroughly before proceeding. Operation must be in strict accordance with all these instructions.

Electric Water Heater Cutaway View



Product Features

High-efficient Double Throw Thermostat

This unique double-throw thermostat makes heating speed fast but will not double your power load. When the heater filled up with cold water is switched on, the thermostat upper throw will activate the upper heating element to heat up the upper tank water; the lower element is on stand-by. When the upper tank water has been heated to the set temperature, it is ready for your use; meantime, the upper element stops and the lower throw will activate lower element to heat the lower part water to set temperature.

The two elements will not work simultaneously.

High-efficient Thermal Insulation Layer

The extra-thick insulation layer is over 50mm in thickness. The thermal retard rate (Value R) exceeds 8.

Anode Protection

Quality anode rod is applied to make tank durable and prolong heater life.

Glass-Lined Tank

This patented A.O.Smith technique evenly coats specialty silicon frit onto the tank inner surface. The frit coating is then fused to the steel at 870°C, forming a durable impact-resistant lining. Further, this glass-lined tank has passed the 100K-times cycle test per UL (Underwriters' Laboratories) standard. As a result of its antirust and anti-scale feature, the water heater life is greatly prolonged.

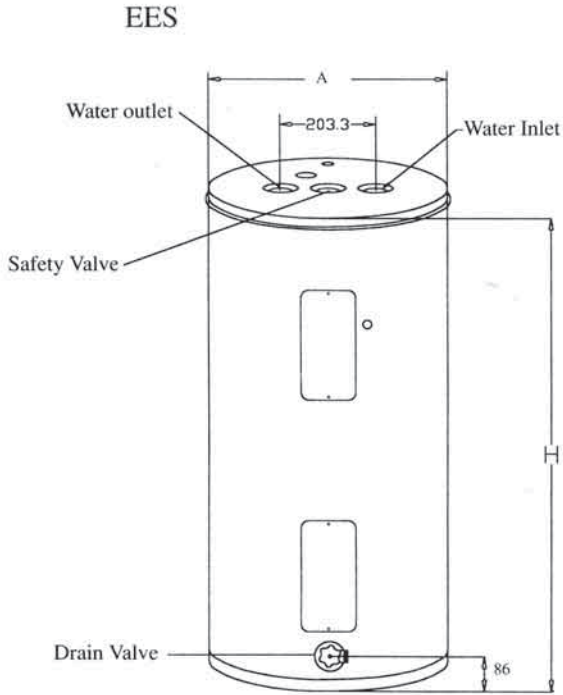
Installation

1. The water heater should be located as close to or centralized to the water piping system as possible; and in an area not subject to freezing temperatures and raining / flooding.
2. Locate the heater so that operation and draining are conveniently accessible. The heater should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the heater or to lower floors of the structure. When such locations cannot be avoided, a suitable drain pan should be installed under the heater. Such pans should have a diameter of at least 50mm greater than that of the heater base. And the water accumulation in the pan should not exceed 45mm in height.
3. The heater must be well grounded.
4. See Wiring Diagram for the heater internal wiring. The voltage and wattage ratings are shown on the water heater data plate. Your power supply must suit these ratings. (see * on page 7 and page 8 for wire specifications)
5. Thermostat locates inside the control box. When necessary to dismount or reset, follow these steps:
 - 1) unplug water heater
 - 2) remove control box cover
 - 3) clean the box inside
 - 4) pull down insulation to reveal thermostat
 - 5) use screwdriver to adjust the screw on the thermostat to set temperature. (maximum temperature is 77°C ± 3°C or 65°C ± 3°C)
6. Power cord runs into heater through the junction box on the heater top or a power port beside control box cover. In the event the power cord is damaged, be sure to replace with specified cord. (see the following power cord specifications)
7. Temperature and pressure safety valve or relief valve should be installed in the required location and should orient downward. No or least connection elbows should be used in drain line of the safety valve (or relief valve). The drain line diameter should be bigger than that of the safety valve (or relief valve). The discharge line must be left open to atmosphere and should be connected down wards within 15cm above a suitable drain. The pipe must be frost free.
8. Connect cold / hot water pipe to heater inlet / outlet. A control valve should be installed in the water inlet piping (not applicable to heaters with relief valve). A closed system will exist if a back-flow preventer (check valve), pressure reducing valve, or other similar device is installed in the cold water line between the water heater and the street main. Excessive pressure may develop due to the thermal expansion of the heated water causing premature tank failure or safety relief valve operation. An expansion tank may be necessary in the cold water supply to alleviate this situation. Contact the local plumbing authority.
9. Do not apply direct welding on water heater for piping connection. If necessary, weld pipe to its connector before connects to water heater inlet/outlet.
10. A drain valve locates on the lower side to water heater (heaters with relief valve, which can perform draining, are not equipped with drain valve), it should piped to a suitable floor drain.
11. When all the water connections have been completed, conduct a water test to check for any leak.

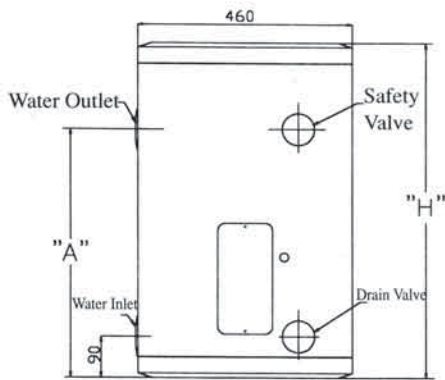
Caution:

Do not turn on power supply until the tank is completely filled. Failure to comply with this instruction will void warranty.

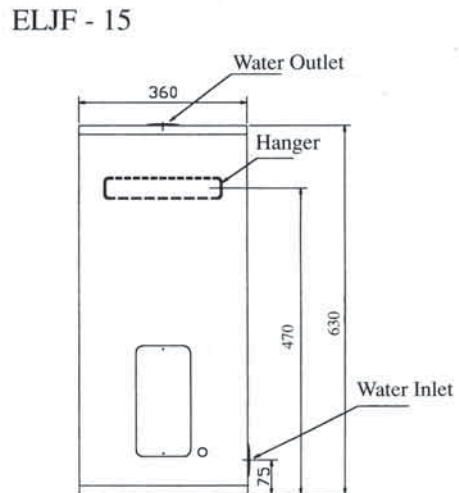
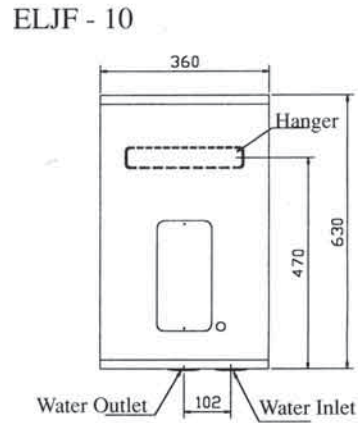
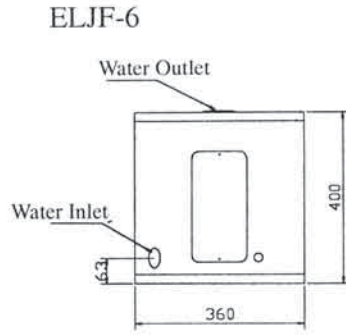
Structure and Main Parts



Model	A	H
EES-30	520	940
EES-40	520	1150
EES-50	520	1365
EES-80	610	1470
EES-120	750	1695



Model	A	H
EES-15	404	585
EES-20	543	730



Operation and Maintenance

Important

After the heater properly installed, correct operation and maintenance is imperative. This practice defines whether or not the heater could run effectively or safely, and also affects heater life.

A. Checklist before use

1. The water heater, power supply, water system, draining system, safety valve etc must be thoroughly checked before first time use or re-use after a long time.
 - Check water system for any leak.
 - See if the drain line is blocked or other unsafe factors existing.
 - Check if any trapped water in the tank has been drained.
 - Check if the supplying power capacity meets the heater ratings, if the heater has been properly grounded. Power cannot be connected before operation.
 - See if there is open flame nearby.
 - Check if temperature and pressure safety valve (or relief valve) is blocked or comes loose.
2. Read this manual thoroughly and follow all related instructions strictly.

B. Start Up

1. Open the hot water faucet to permit air escape.
2. Open the cold water inlet valve to fill the heater.
3. Close the hot water faucet when it flows. Cold water inlet valve should be kept open during operation.
4. Check for leak by lifting the safety (or relief) valve lever. Carefully pull up the lever, it should discharge; release the lever, the discharge should stop.
5. After making certain that the tank is fully filled and the electric connection is correctly completed, turn the heater power on.

C. Operation and Maintenance

1. Always mix hot outlet water with cold water and feel the mixed temperature before use to avoid the risk of scalding.
2. This appliance is equipped with quality thermal insulation layer and thermostat system. It is unnecessary to turn off power frequently. Thermostat will cut off and re-start automatically.
3. The scale sediment should be removed periodically (usually about every 15 days). Opening the drain valve (or relief valve) until sees water running clear
4. It is recommended to flush the tank after a period of use. Shut off power supply, close cold water valve, open hot water valve and drain valve to drain the tank. Open cold water valve to flush for a few minutes before closing drain valve. Close hot water valve after making sure the tanks is completely filled.

For those heaters with relief valve (but no safety valve and drain valve), specific piping system is required to conduct tank flushing.

5. Follow the above 'Start Up' procedure to re-use.
6. Heater, no matter if it's in use or not, may not be flooded.
7. **Temperature and pressure safety valve (or relief valve) should be checked at least every half a year!** Lift the safety valve lever (or relief valve) to see if it discharges water. Caution: the discharged water may hot, care should be taken to avoid scalding injury. Reset the safety (or relief) valve after the check is completed and no problem is found. If no water discharged, call for customer service immediately. **Again, do no block the relief valve and its drain line.**

8. The high temperature limit switch (high limit) activates and cuts off power supply when the temperature gets abnormally high. And the high limit will not reset by itself. If it occurs, be sure to cut off power supply, find out cause and solve the problem, fill the tank with cold water to have the tank water drop 25°C; then open the upper access panel, press the red manual button (RESET) to re-start the heater operation.

Warning: Only professionals are allowed to do this. User can contact customer service for assistance.

9. When water supply outage occur or no hot water after turning on hot water faucet, close off the hot water faucet immediately to prevent tank water be suck back to main piping and 'dry fire' damage.
10. If the temperature and pressure safety valve (or relief valve) activates oftentimes and there are hot water or steam discharged from the drain line, shut off power supply immediately. Call for customer service before re-use.
11. See chart A for troubleshooting information.
12. Drain the heater completely to prevent freezing whenever the heater is left unused during the cold weather months.

Caution:

This water heater is electrically wired per US standard. Connect the black lead to the hot line of the 220V supply power, and the red lead to the neutral line.

Wiring Diagram

Single Element Heater

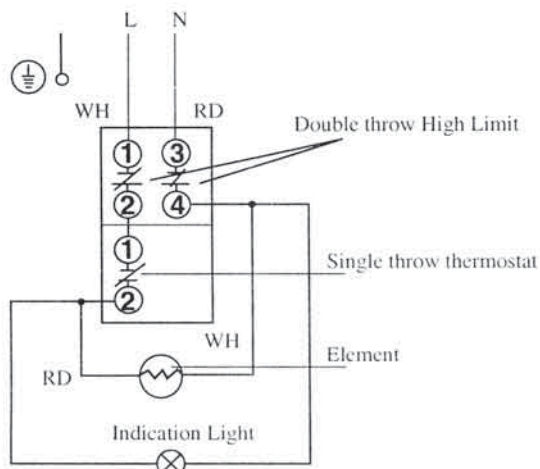


Figure 1

Double Element Heater

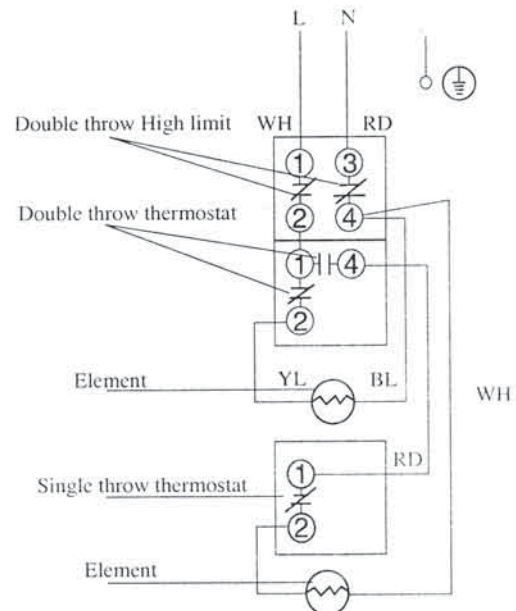


Figure 2

*All types of electric water heater may use 1.25KW,2KW,2.5KW or 3.8KW heating elements (at 220V);the respective current are 5.7A,9.1A,11.4A and 17.3A.The minimum copper power cord section requirements are 1.0mm²,1.5mm²,2.5mm²and 2.5mm² respectively.

*We don't use indication light in ELJF-6,ELJF-15.

EES Wiring Diagram (Big Power)

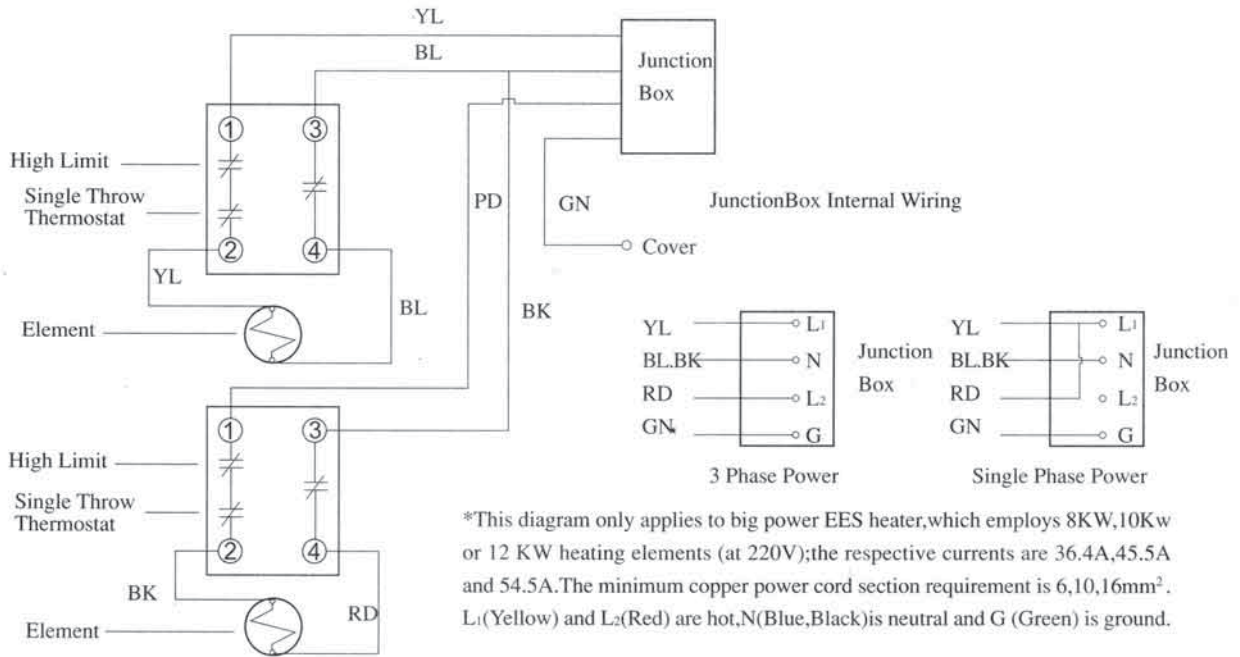
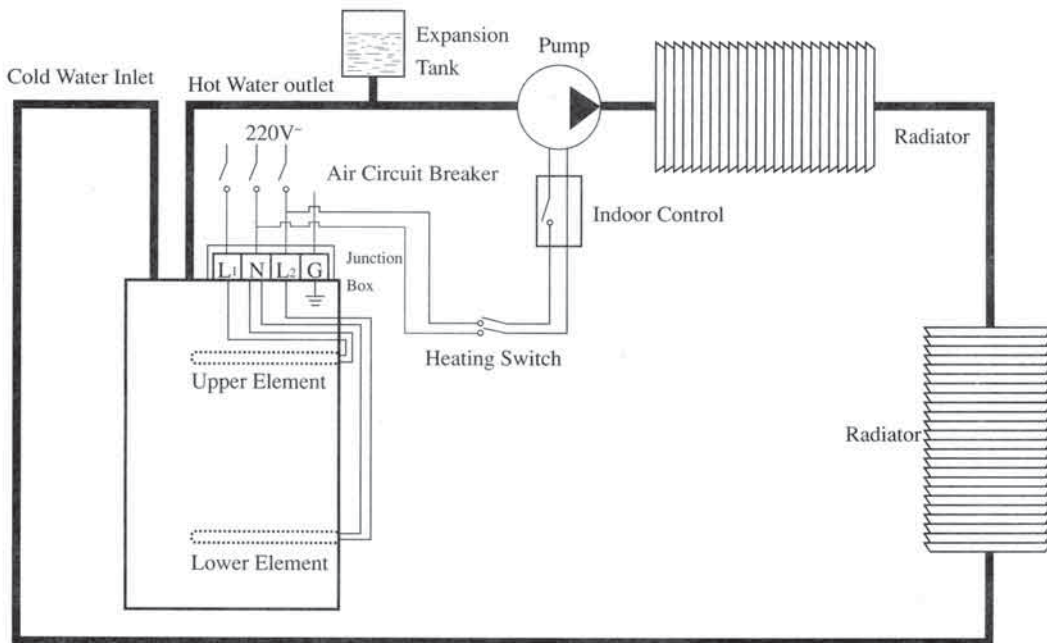


Figure 3

EES Space Heating



- Note 1. This diagram is for reference only; specific calculation is necessary for actual usage.
- 2. Customer provides all items in this diagram, excluding water heater (its junction box and elements).
- 3. The shown wiring is 3 phase. Space heating layout is similar for single-phase wiring.

Chart A Troubleshooting

Problem	Possible Cause	Solution
Water leaks	Water connections (Pipes & safety valve etc) not well sealed	Tighten and seal all connections
Hot water odors	High sulfate or mineral content in water	Drain and flush water tank
	Bacteria in water supply	Chlorinate water supply
Not enough or No hot water	Power supply to heater is not on	Turn the power on
	Thermostat set too low	Adjust the thermostat
	Heater undersized	Reduce hot water use or upgrade heater
	Incoming water is unusually cold (winter)	Allow more time to heat
	Leaking hot water from pipes or fixtures	Repair leaks
	High temperature limit switch activated	Call for customer service
Water too hot	Thermostat set too high	Adjust the thermostat or mix more cold water
	Temperature control system faulty	Call for customer service
Water heater sounds	Scale accumulation on elements	Remove scale from elements
	Sediment build-up on tank bottom	Drain & flush thoroughly

Chart B Specifications:

Model	Capacity(L)	Voltage (V)/(Hz)	Input (KW)	Temperature (°C)	Rated Water Pressure(MPa)	Net Weight(Kg)	Dimensions(mm)	Inlet (Outlet) Connector
ELJF6	23	220~240VAC 50/60Hz	1.5-1.8 2.0-2.4	32-65 ± 5	1	14	360 × 360 × 400	1/2"
ELJF10	40	220~240VAC 50/60Hz	1.5-1.8 2.0-2.4	32-65 ± 5	1	19	360 × 360 × 630	1/2"
ELJF15	60	220~240VAC 50/60Hz	1.5-1.8 2.0-2.4	32-65 ± 5	1	26	360 × 360 × 840	1/2"
EES-15	55	220~240VAC 50/60Hz	2.0-2.4 3.0-3.6	32-65 ± 5	1	25	470 × 460 × 585	1/2"
EES-20	75	220~240VAC 50/60Hz	2.0-2.4 3.8-4.5	32-65 ± 5	1	28	470 × 460 × 730	1/2"
EES30	120	220~240VAC 50/60Hz	2.0-2.4 3.8-4.5 6.0-7.0	32-65 ± 5	1	43	530 × 520 × 940	3/4"
EES30H	120	220~240VAC 50/60Hz	8-9.5 12-14.5	32-65 ± 5	1	43	530 × 520 × 975	3/4"
EES40	150	220~240VAC 50/60Hz	2.0-2.4 3.8-4.5	32-65 ± 5	1	41	530 × 520 × 1115	3/4"
EES40H	150	220~240VAC 50/60Hz	8-9.5 12-14.5	32-65 ± 5	1	41	530 × 520 × 1150	3/4"
EES50	190	220~240VAC 50/60Hz	2-2.4 3.8-4.5	32-65 ± 5	1	63	530 × 520 × 1365	3/4"
EES50H	190	220~240VAC 50/60Hz	8.0-9.5 12-14.5	32-65 ± 5	1	63	530 × 520 × 1400	3/4"
EES80	300	220~240VAC 50/60Hz	2-2.4 3.8-4.5	32-65 ± 5	1	94	620 × 610 × 1470	3/4"
EES80H	300	220~240VAC 50/60Hz	10-12 12-14.5	32-65 ± 5	1	94	620 × 610 × 1510	3/4"
EES120	455	220~240VAC 50/60Hz	2-2.4 3.8-4.5	32-65 ± 5	1	153	760 × 750 × 1570	3/4"
EES120H	455	220~240VAC 50/60Hz	10-12 12-14.5	32-65 ± 5	1	153	760 × 750 × 1610	3/4"

Packing List:

- i) Electric Water Heater, 1 set; ii) Instruction Manual, 1 piece; iii) Relief Valve, 1 piece