Heat Pump Water Heater

LG TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

LG Life's Good

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Heat Pump Water Heater
- 60 Hz (R134a)

1. Models Line Up

Category	Picture	Chassis	Model Name	Nominal Volume [L(gal)]
		RF	R5TT20F-SA0	220 (58)

2. Nomenclature

R	5	T	T	2	0	F	-	S	A	0
1	2	3	4	5	6	7	8	9	10	11

Code	Type	Code of Model	Meaning
1	Product Type	A~Z	R: Heat Pump Water Heater
2	Refrigerant	0~9	2: R22 3: R32 4: R410A 5: R134a 6: R290
3		A~Z	T: Packaged - : Set N: Indoor unit U: Outdoor unit A: C/SKD Indoor unit B: C/SKD outdoor unit M: Mock-up
4	Compressor type	A~Z	T: Inverter Heating Only W: Inverter Heating & Cooling
5, 6	Capacity	0~9	Water tank capacity Ex. “20” → 200 liters
7	Indoor unit platform	A~Z	F: Frontier
8	Outdoor unit platform	A~Z	-: Packaged (No outdoor unit)
9	Look/Color	A~Z	S: Frontier Silver B: Frontier Black
10	Function	A~Z	A: Smart function + Hybrid mode
11	Serial No.	1~9	LG Model Development Serial No.

3. Specifications

Buyer Model / Factory Model	Set (Indoor / Outdoor)		Unit	R5TT20F-SA0 / R5TT20F-SA0
	Volume (Norminal)			58(220L)
	Volume (Rated)			52(197.7L)
	UEF			3.75
	FHR		Gallon(L)	66(249.8)
	FHR (Turbo Mode)		Gallon(L)	80(302)
	Annual Energy Consumption		kWh	866
Power Input	Upper Element Wattage (208V / 240V)		kW	3.8 / 5.0
	Lower Element Wattage (208V / 240V)		kW	3.8 / 5.0
Energy Star			-	Yes
Tax Credit			-	-
Power Supply			Ø, V, Hz	1Φ,208-240V,60Hz
Available Voltage Range			V	176 ~ 276
Indoor	Air Flow Rate	H/M	㎥/min	6.7 / 4.4
		H/M	CFM	236.6/155.4
	RPM	H/M	-	1000/700
	Sound Pressure Level	Auto	dB(A)+3	40
	Sound Pressure Level	Turbo/Heat Pump	dB(A)+3	42
	Sound Power Level		dB(A)	-
	Dimensions	Net (W x H x D)	mm	580 x 1625 x 582
			in.	22 53/64 x 63 31/32 x 22 29/32
		Shipping (W x H x D)	mm	738 x 1775 x 690
			in.	29 1/16 x 69 7/8 x 27 11/64
		A	mm	1625
			in.	63 31/32
		B	mm	580
			in.	22 53/64
		C	mm	998
			in.	39 19/64
		D	mm	147
			in.	5 25/32
		E	mm	147
			in.	5 25/32
	Weight	Net	kg	100
			lb.	220
		Shipping	kg	118
			lb.	260
	Operation Range	Heating	℃ DB	-5 ~ 48.9
			℉ DB	23 ~ 120
	Max. Fuse Size		A	13.5
	Exterior Color Code		-	Luxury Silver
Compressor	Type		-	Twin Rotary
	Model		-	EST092MBA
	Motor Type		-	BLDC
	Oil Type / Maker		-	POE (RB68A) / Sun Oil or Jx Nippon or PVE (FVC68D) / IDEMITSU
	Oil Charge		cc	220
	O.L.P. Name		-	-
	Rated Load Ampere (208V / 240V)		A	3.3 / 3.1
	Manufacturer / Country of Origin		-	LG Electronics / China
Fan	Type		-	Propeller Fan
	Motor Type		-	BLDC
	Motor Output		W	43
	Full Load Ampere (FLA)		A	0.22
Heat Exchanger	Evaporator	Material, Tube / Fin	-	Cu / Al
		Fin Spacing	FPI	21 (Φ 7)
		(Φ x Row x Column x FPI/FPDM x L) x No.	ㅐ1	(Φ 7 x 3 x 15 x 21 x 390) x 1
		Corrosion Protection	-	PCM
	Condenser	Material, Tube	-	Al
		(Φ x Row x L) x No.	ㅐ1	(Φ 8 x 1 x 50000) x 1
		Corrosion Protection	-	-

Note

- – : No Relation
- For Circuit Breaker Rating, please conform to local standards whenever necessary.
- Exterior color code is approximate value.
- It is difficult to measure air flow rate of sleep because of small values.
- Maximum heating capacity is for heating operation without any frost.
- Some specifications may be changed without notifications due to our policy of innovation.

3. Specifications

Buyer Model / Factory Model	Set (Indoor / Outdoor)		Unit	R5TT20F-SA0 / R5TT20F-SA0
Design Pressure (System)		High Side	-	2.0MPa / 290 PSI
		Low Side	-	0.9MPa / 130.5 PSI
Max Working Pressure (Water Tank)			-	150 PSI (1034 kPa)
Minimum Circuit Ampacity			A	30.1
Circuit Breaker			A	30
Power Supply Cable			No.	3
			㎟	2.5
			AWG	10
Drain Hose Size		I.D	mm	19, 12.7
			in.	3/4, 1/2
Refrigerant		Type	-	R134a
		Pre Charge	g	650
			oz.	23
		Additional Charge	g/m	-
			oz./ft.	-
		Control	-	Electronic Expansion Valve
Defrost Method			-	Reverse Cycle
Anode				Sacrificial
Foam Insulation			inch	1.6 ~ 2.4
T&P Relief Valve			-	Yes
Water Cnnection Location			-	side
Water Connection Size			inch	3/4
Digital Display			-	Yes
Wi-Fi			-	Yes
Tank Warranty			year	10

Note

- – : No Relation
- For Circuit Breaker Rating, please conform to local standards whenever necessary.
- Exterior color code is approximate value.
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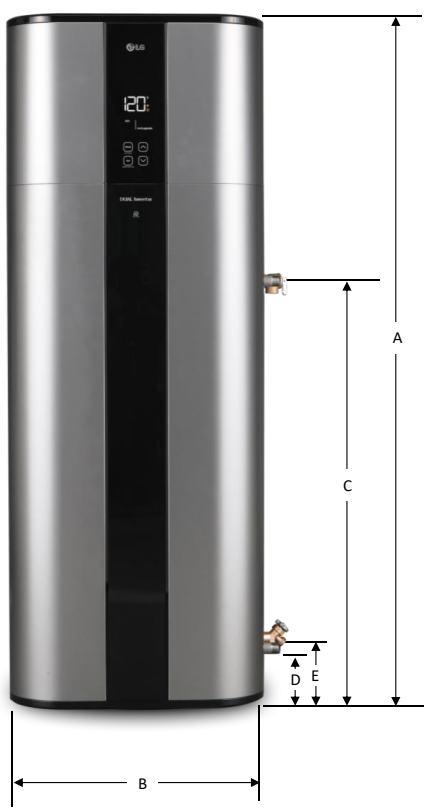


4. Function List

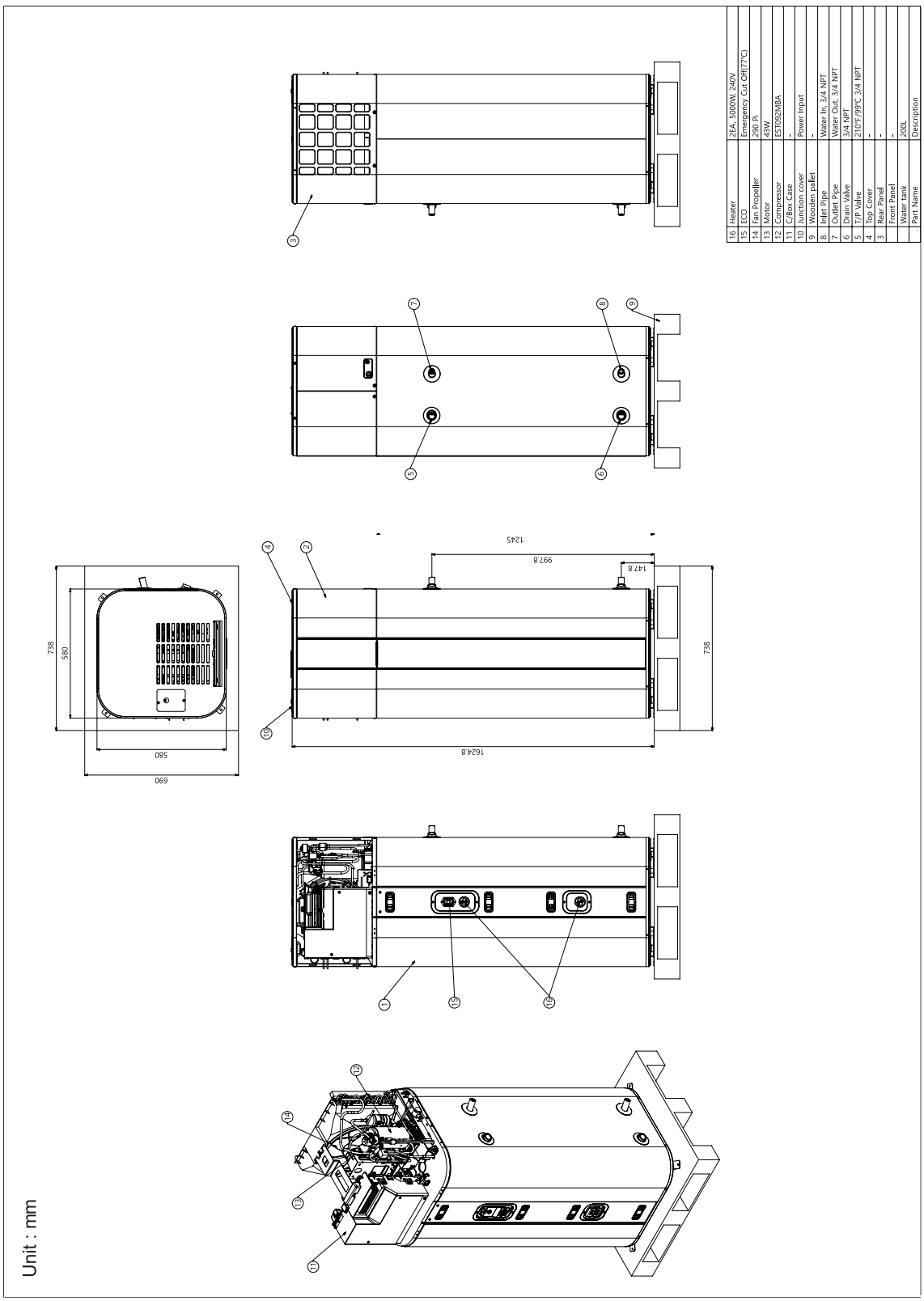
Category	Function	Description
Air Purifying	Prefilter (Washable / Anti-Bacteria)	Capture dust particles over 10μm in size and finer bacteria.
Reliability	Self Diagnosis	Self-diagnostic for product protection.
	De-ice Control (Defrost)	In the heating mode, de-icing of the outdoor heat exchanger automatically.
Convenience	HeatPump	This mode minimizes power consumption by using only heat pump for heating.
	Auto	This mode provides relatively low power consumption and high recovery. This mode primary uses heat pump for heating. This mode is factory set mode for shipping.
	Turbo	This mode provides the highest recovery. This mode uses heat pump and heating element simultaneously.
	Vacation	This feature is recommended when the water heater is not in used for an extended period of time. In this mode, tank temperature will be maintained at about 68°F to minimize energy consumption and prevent the water heater from freezing.
	Schedule	The Custormer can set up the operation time and mode based on their Demand Condition.
	Auto Restart Operation	If power is resupplied after blackout, product restart automatically.
	Two Thermistor Control [1]	If there is a temperature difference between room temperature and desired temperature, you can use this function in other to prevent insufficient cooling and insufficient heating.
	Overheating Protection	If there is a temperature difference between room temperature and desired temperature, you can use this function in other to prevent over-heating.
	Indoor Unit Display Type	-
	Indoor Unit Display Light	Set the brightness of the display on the indoor unit.
Individual Control	Wired Remote Controller [2]	-
	Handheld Wireless Controller	-
CAC Network Function	General Central Controller (Non LGAP)	-
	Network Solution (LGAP)	-
	Dry Contact [2]	-
	PDI (Power Distribution Indicator) [2]	-
	Outdoor Unit PI 485 [2]	-
Special Function Kit	Wi-Fi [2]	Easily access and control an air conditioner's functions from anywhere.
	Water Level Sensor Connection [2]	Detect the water level in drain pan.
	Crank Case Heater	Pre-heating the compressor during winter.
	Smart Inverter Monitoring System (SIMs)[2]	**Help you to easily monitor, diagnose the air conditioner and get a quick resolution.**
Others	Temperature Control	Basic cycle control method.

Note

- These functions must be applied according to the model. Please refer to the following function list for each model.
- [1] : This function can be operated only when the wired remote controller is connected. The applicability of each function depends on the above table.
- [2] : Optional accessories must be purchased separately. If shown as "Embedded", this function is included in product.
- The function Wi-Fi is only compatible with 2.4 GHz band. (802.11 b/g/n)
- Some specifications may be changed without notifications due to our policy of innovation.
- The air conditioner which DRED is available is capable of DRM1,DRM2 and DRM3 and complies with standard AS/NZS 4755.3.1.

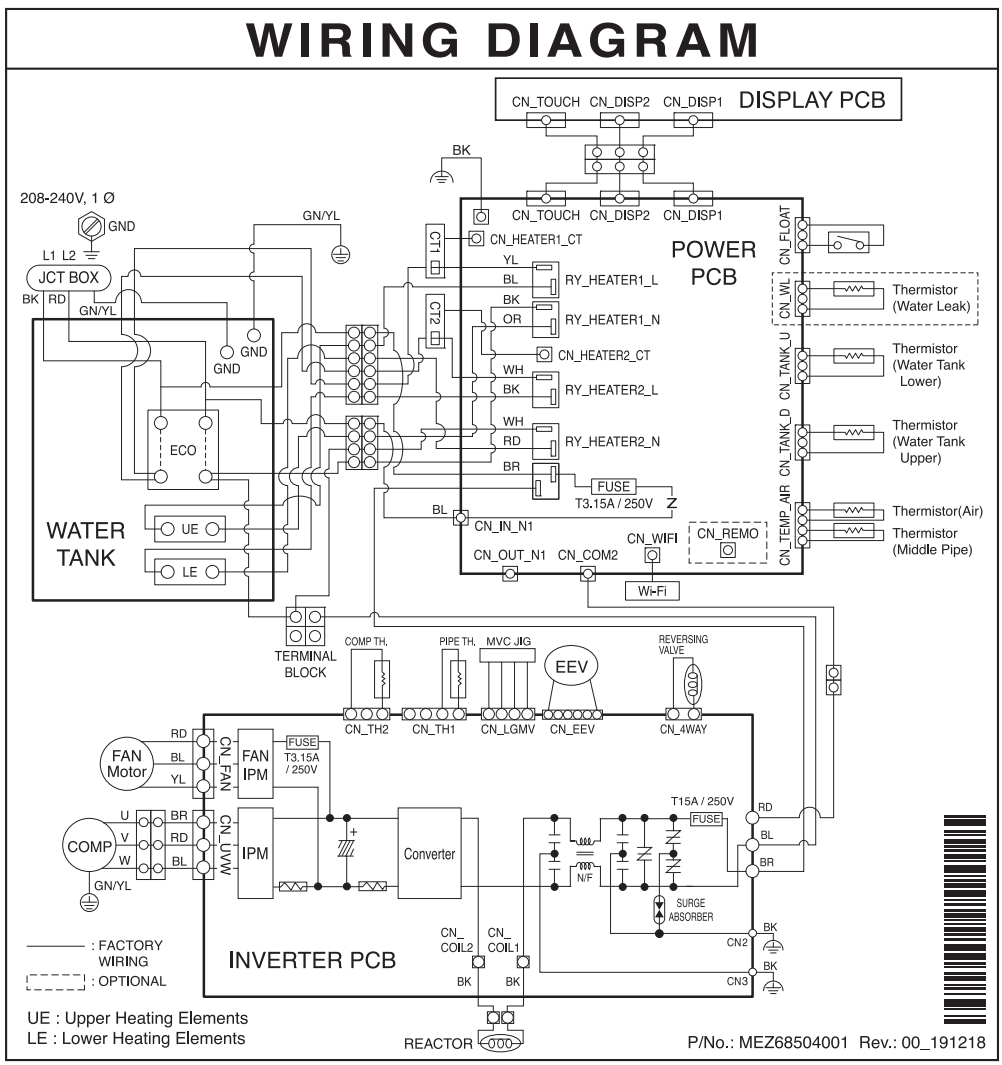
5. Dimensional Drawings

R5TT20F-SA0



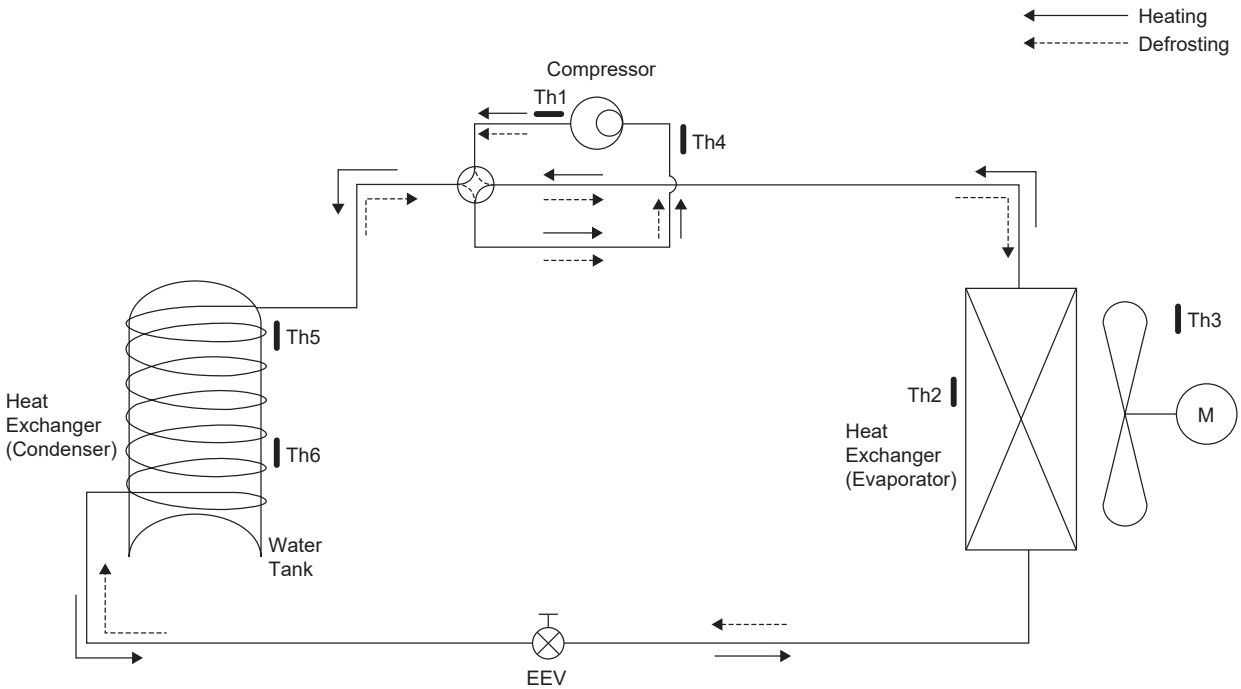
6. Wiring Diagrams

R5TT20F-SA0



7. Refrigerant Cycle Diagrams

R5TT20F-SA0



LOC	Description	PCB Connector
Th1	Thermistor for discharge pipe temperature	CN_TH2
Th2	Thermistor for evaporating temperature	CN_TEMP_AIR
Th3	Thermistor for indoor air temperature	CN_TEMP_AIR
Th4	Thermistor for suction pipe temperature	CN_TH1
Th5	Thermistor for upper water tank temperature	CN_TANK_D
Th6	Thermistor for lower water tank temperature	CN_TANK_U

*EEV : Electronic Expansion Valve.

8. Capacity Tables

8.1 Capacity table

1) COP

Ambient temp.	Initial water tank temp.(℃)	Setting temp.(℃)																	
		Auto Mode						Heatpump Mode						Turbo Mode					
		35	40	45	50	55	60	35	40	45	50	55	60	35	40	45	50	55	60
-5℃	10	1.69	1.45	1.25	1.10	0.99	0.93	2.72	2.64	2.51	2.33	2.12	1.86	1.69	1.45	1.25	1.10	0.99	0.93
	20	2.57	1.66	1.46	1.31	1.20	1.14	2.57	2.49	2.36	2.19	1.97	1.71	1.90	1.66	1.46	1.31	1.20	1.14
	30		2.30	2.17	1.33	1.22	1.16		2.30	2.17	2.00	1.78	1.52		2.30	1.48	1.33	1.22	1.16
	40				1.78	1.56	1.30				1.78	1.56	1.30				1.78	1.04	0.97
	50						0.90						1.04						0.90
20℃	10	1.86	1.79	1.67	1.54	1.40	1.25	4.30	4.10	3.91	3.71	3.50	3.30	1.71	1.64	1.56	1.48	1.40	1.31
	20	5.73	2.03	1.91	1.78	1.64	1.49	4.15	3.96	3.76	3.56	3.36	3.15	1.79	1.72	1.64	1.56	1.47	1.39
	30		4.79	4.37	2.02	1.88	1.73		3.64	3.44	3.24	3.04	2.83		3.64	1.66	1.58	1.49	1.41
	40				3.56	3.21	1.97				2.74	2.54	2.33				2.74	1.46	1.37
	50						2.54						1.66						1.66
48℃	10	1.95	1.97	1.92	1.80	1.60	1.32	6.00	5.75	5.51	5.30	5.11	4.94	1.79	1.81	1.78	1.71	1.60	1.46
	20	10.07	2.21	2.16	2.03	1.83	1.56	5.66	5.41	5.17	4.96	4.77	4.60	2.05	2.07	2.04	1.97	1.86	1.72
	30		8.61	7.99	2.07	1.86	1.59		5.09	4.86	4.65	4.45	4.29		5.09	2.31	2.25	2.14	1.99
	40				6.12	5.50	1.42				4.35	4.16	3.99				4.35	2.42	2.27
	50						3.22						3.72						3.72

2) Power Consumption integ. (kWh)

Ambient temp.	Initial water tank temp.(℃)	Setting temp.(℃)																	
		Auto Mode						Heatpump Mode						Turbo Mode					
		35	40	45	50	55	60	35	40	45	50	55	60	35	40	45	50	55	60
-5℃	10	3.21	4.62	5.97	7.28	8.55	9.77	1.85	2.30	2.93	3.75	4.75	5.93	3.21	4.62	5.97	7.28	8.55	9.77
	20	1.20	2.61	3.97	5.28	6.54	7.76	1.20	1.65	2.28	3.10	4.10	5.28	1.21	2.61	3.97	5.28	6.54	7.76
	30		0.79	1.43	3.25	4.52	5.74		0.79	1.43	2.24	3.25	4.43		0.79	1.94	3.25	4.52	5.74
	40				1.19	2.19	3.69				1.19	2.19	3.37				1.19	2.47	3.69
	50						1.62						2.11						1.62
20℃	10	2.31	3.21	4.29	5.53	6.95	8.55	1.10	1.44	1.82	2.26	2.74	3.28	2.39	3.38	4.40	5.46	6.56	7.69
	20	0.50	1.36	2.43	3.68	5.10	6.69	0.63	0.97	1.35	1.78	2.27	2.81	0.74	1.72	2.75	3.81	4.91	6.04
	30		0.36	0.67	1.64	3.07	4.66		0.45	0.84	1.27	1.76	2.30		0.45	1.09	2.15	3.25	4.39
	40				0.52	0.94	2.45				0.72	1.20	1.74				0.72	1.59	2.73
	50						0.78						1.15						1.15
48℃	10	2.06	2.67	3.51	4.57	5.87	7.39	0.74	0.98	1.24	1.53	1.84	2.17	2.16	3.04	3.90	4.76	5.60	6.43
	20	0.25	0.86	1.70	2.77	4.06	5.58	0.43	0.67	0.93	1.22	1.53	1.86	0.43	1.31	2.17	3.03	3.87	4.70
	30		0.17	0.33	0.93	2.22	3.74		0.27	0.54	0.82	1.13	1.47		0.27	0.54	1.40	2.24	3.07
	40				0.30	0.53	1.86				0.35	0.66	1.00				0.35	0.71	1.54
	50						0.54						0.45						0.45

3) Recovery Time (hour)

Ambient temp.	Initial water tank temp.(℃)	Setting temp.(℃)																	
		Auto Mode						Heatpump Mode						Turbo Mode					
		35	40	45	50	55	60	35	40	45	50	55	60	35	40	45	50	55	60
-5℃	10	3.00	3.47	3.71	3.90	3.44	3.29	4.96	6.67	7.94	9.05	9.61	9.75	2.70	3.13	3.37	3.56	3.44	3.29
	20	3.05	3.25	3.49	3.67	3.15	2.95	3.05	4.67	6.03	7.27	7.28	7.45	2.44	2.89	3.12	3.31	3.15	2.95
	30		2.36	3.88	3.67	3.01	2.71		2.36	3.88	5.31	5.01	5.20		2.36	3.06	3.25	3.01	2.71
	40				2.42	2.61	2.32				2.42	2.61	2.82				2.42	2.64	2.32
	50						0.42						0.42						0.42
20℃	10	2.77	3.06	3.37	3.67	3.98	4.30	2.56	3.29	4.02	4.80	5.57	6.38	1.69	1.95	2.20	2.44	2.68	2.92
	20	2.68	2.70	3.01	3.32	3.63	3.94	1.50	2.20	2.91	3.68	4.44	5.25	1.33	1.60	1.84	2.09	2.32	2.56
	30		1.81	3.08	3.12	3.44	3.76		1.04	1.74	2.50	3.28	4.09		1.04	1.51	1.76	1.99	2.23
	40				2.09	3.53	3.53				1.16	1.94	2.75				1.16	1.65	1.89
	50						2.50						1.26						1.26
48℃	10	1.85	2.11	2.34	2.54	2.73	2.91	1.32	1.75	2.28	2.88	3.52	4.17	1.15	1.39	1.64	1.90	2.16	2.41
	20	1.60	1.87	2.12	2.35	2.56	2.77	0.80	1.21	1.71	2.27	2.90	3.54	0.83	1.06	1.32	1.57	1.83	2.08
	30		1.05	1.76	1.94	2.15	2.36		0.57	1.03	1.56	2.15	2.78		0.57	0.99	1.25	1.50	1.75
	40				1.13	1.85	1.98				0.74	1.30	1.91				0.74	1.19	1.43
	50						1.31						0.91						0.91

H/P + Heater Operating
Heater Only Mode

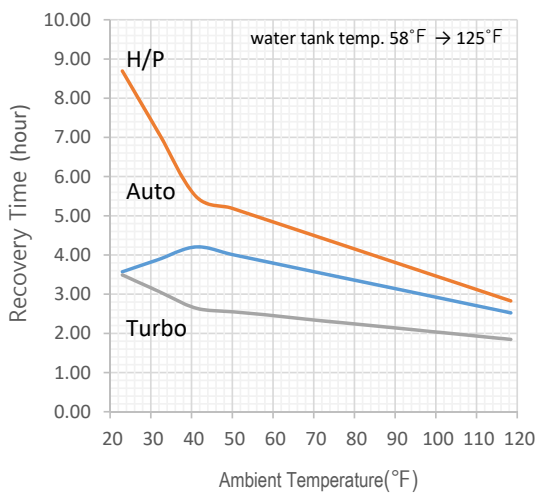
8. Capacity Tables

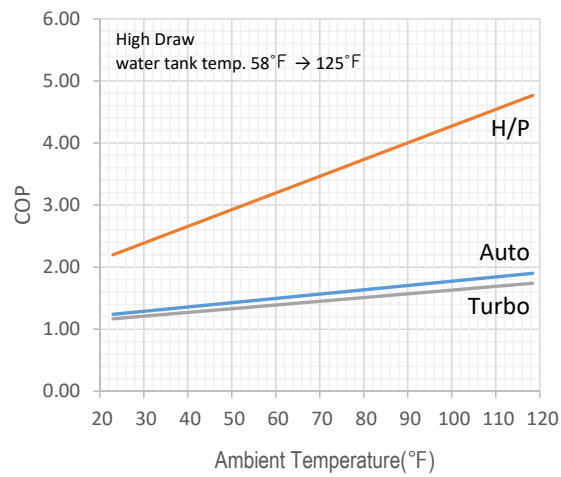
8.2 Performance Graph

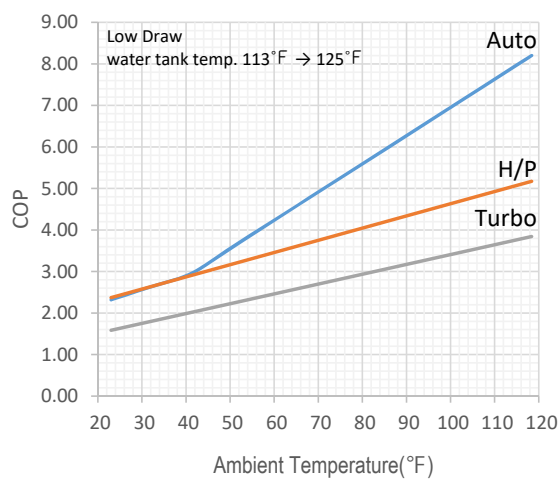
Ambient Temperature	Recovery Time (hour)			COP of High Draw			COP of Low Draw		
°F	Auto	H/P	Turbo	Auto	H/P	Turbo	Auto	H/P	Turbo
23	3.57	8.69	3.49	1.12	2.13	1.14	2.32	2.37	1.49
24.8	3.63	8.37	3.41	1.16	2.20	1.16	2.38	2.38	1.53
32	3.89	7.10	3.07	1.30	2.45	1.23	2.63	2.44	1.65
41	4.21	5.50	2.65	1.47	2.76	1.33	2.94	2.52	1.81
50	4.01	5.19	2.55	1.51	3.03	1.38	3.55	2.90	2.10
59	3.81	4.88	2.46	1.55	3.30	1.43	4.17	3.29	2.39
68	3.62	4.57	2.37	1.60	3.57	1.49	4.78	3.67	2.67
77	3.42	4.26	2.27	1.64	3.69	1.51	5.39	3.84	2.80
86	3.23	3.95	2.18	1.68	3.81	1.53	6.00	4.01	2.92
95	3.03	3.64	2.09	1.72	3.93	1.56	6.61	4.18	3.05
104	2.84	3.33	1.99	1.77	4.05	1.58	7.22	4.35	3.17
118.4	2.52	2.83	1.85	1.83	5.09	1.79	8.20	5.83	4.28

Note

1. All capacities are net, evaporator fan motor heat is deducted.
2. Direct interpolation is permissible. Do not extrapolate.
3. Capacities are based on the following conditions :
   - Indoor Air Temperature : 70 °F (20.0 °C) DB / 60 °F (15.0 °C) WB







9. Capacity Coefficient Factor

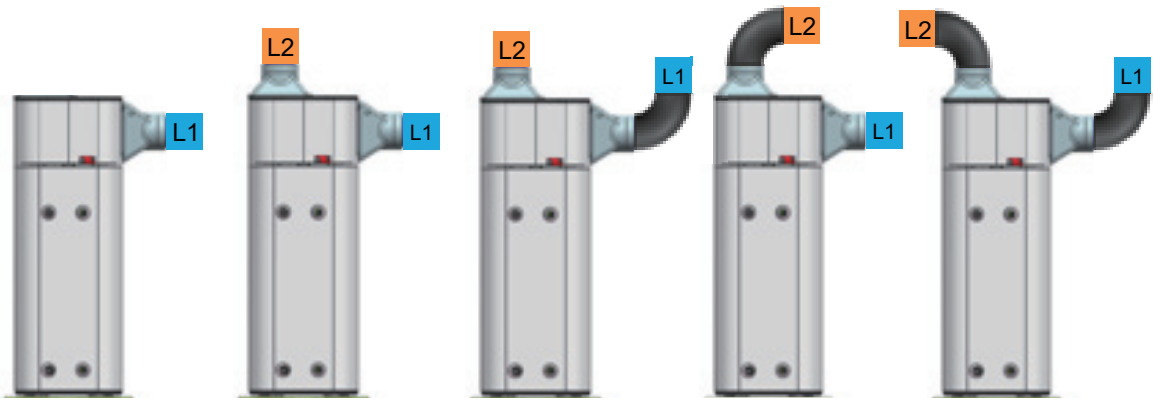
9.1 Capacity Change Rate (%)

Model	Duct Length (1m / 3.3ft)			
Duct Type.	**Diameter**	**Not Ducted**	**8"(Φ200)**	**6"(Φ150)**
R5TT20F-SA0	COP(%)	100.0%	96.7%	92.0%

9. Capacity Coefficient Factor

9.2 Maximum Duct Length

Allowable duct length



Case 1 **Case 2** **Case 3** **Case 4** **Case 5**

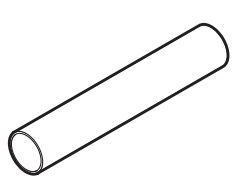
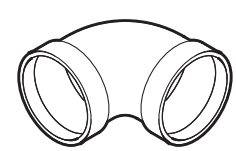
System Static Pressure		Case	Case 1		Case 2		Case 3		Case 4		Case 5	
1150 rpm	P(Pa)	Size	Ø 200	Ø 160	Ø 200	Ø 160	Ø 200	Ø 160	Ø 200	Ø 160	Ø 200	Ø 160
		Remark	Outlet only		No Elbow		Elbow x 1		Elbow x 1		Elbow x 2	
3.6 CMM	55	L1+L2	62	25	55	22	52	19	52	19	49	16
4.5 CMM	43	(m)	31	12	27	10	24	7	24	7	21	4

NOTE

• Total of static pressure must not exceed 55 Pa.

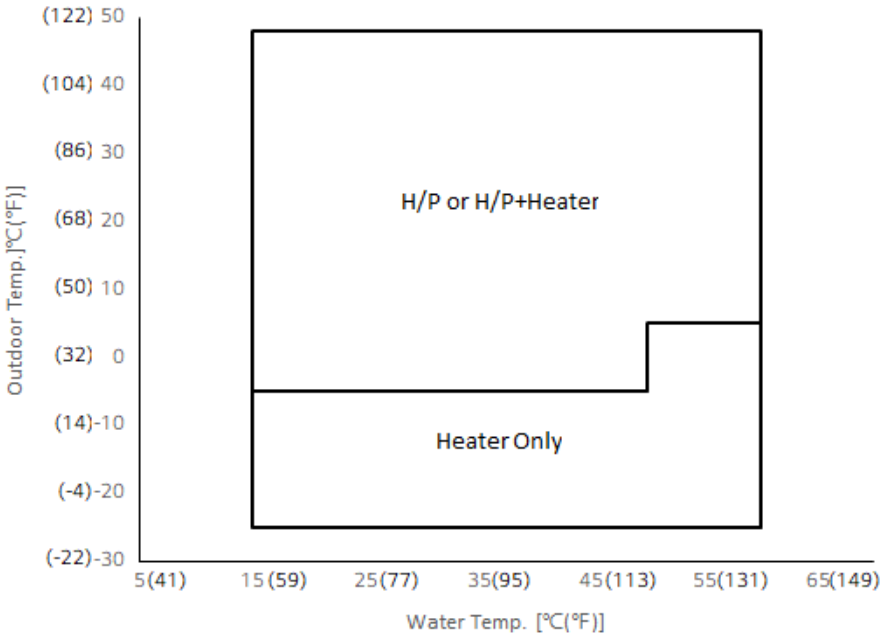
Static pressure calculation table

Component	3.6 CMM			4.5 CMM		
	Smooth	Smooth 90˚	Duct adapter	Smooth	Smooth 90˚	Duct adapter
	PVC Duct (Pa/m)	PVC Bend (Pa/EA)	(Suc. & Dis. set) (Pa)	PVC Duct (Pa/m)	PVC Bend (Pa/EA)	(Suc. & Dis. set) (Pa)
Ø160	2	6	-	3.1	9.4	-
Ø200	0.8	2.3		1.2	3.7	
Adaptor			5.5 + 5.5			5.8 + 5.8

PVC Duct	PVC 90˚ Bend
	

10. Operation Range

R5TT20F-SA0



Note

The figures are based on the following conditions:

- Level Difference : 0 m (0 ft.)

11. Electric Characteristics

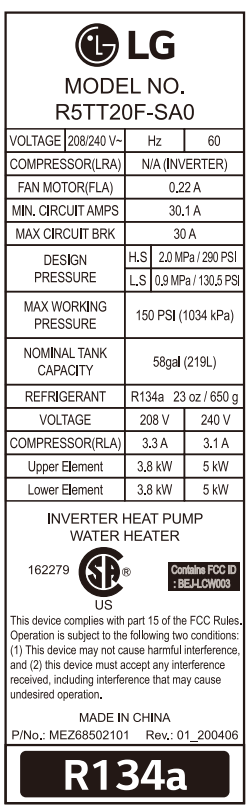
R5TT20F-SA0

Model	Unit				Power		Compressor			FM	
Indoor Unit	Type	Hz	Voltage	Voltage Range	MCA	MOP	MSC	RLA		W	FLA
								Cool	Heat		
R5TT20F-SA0	Inverter	60	208 / 240	Min : 187 Max : 276	30.1	30.0	-	-	3.3	43	0.22

Note

1. Voltage range
   Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2 %.
3. Select wire spec. based on the larger value of MCA.
4. RLA is measured during each individual compressor test condition.
5. OFM is measured as the outdoor unit test condition.
6. Recommended circuit breaker is ELCB. (Earth Leakage Circuit Breaker)

MCA : Minimum Circuit Amperes (A)
MOP : Maximum Rating Over Current Protective Device (A)
MSC : Maximum Starting Current (A)
RLA : Rated Load Amperes (A)
FM : Fan Motor
W : Fan Motor Rated Output (W)
FLA : Full Load Amperes (A)


LG

MODEL NO.
R5TT20F-SA0

VOLTAGE	208/240 V~	Hz	60
COMPRESSOR(LRA)	N/A (INVERTER)		
FAN MOTOR(FLA)	0.22 A		
MIN. CIRCUIT AMPS	30.1 A		
MAX CIRCUIT BRK	30 A		
DESIGN PRESSURE	H.S	2.0 MPa / 290 PSI	
	L.S	0.9 MPa / 130.5 PSI	
MAX WORKING PRESSURE	150 PSI (1034 kPa)		
NOMINAL TANK CAPACITY	58gal (219L)		
REFRIGERANT	R134a 23 oz / 650 g		
VOLTAGE	208 V	240 V	
COMPRESSOR(RLA)	3.3 A	3.1 A	
Upper Element	3.8 kW	5 kW	
Lower Element	3.8 kW	5 kW	

INVERTER HEAT PUMP
WATER HEATER

162279 US

Contains FCC ID : BEJ-LCW003

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

MADE IN CHINA

P/No.: MEZ68502101 Rev.: 01_200406

R134a

※ NSF372 will be certified by CSA unitl May 2021

12. Sound Levels (Reference Data)

12.1 Sound Pressure Level

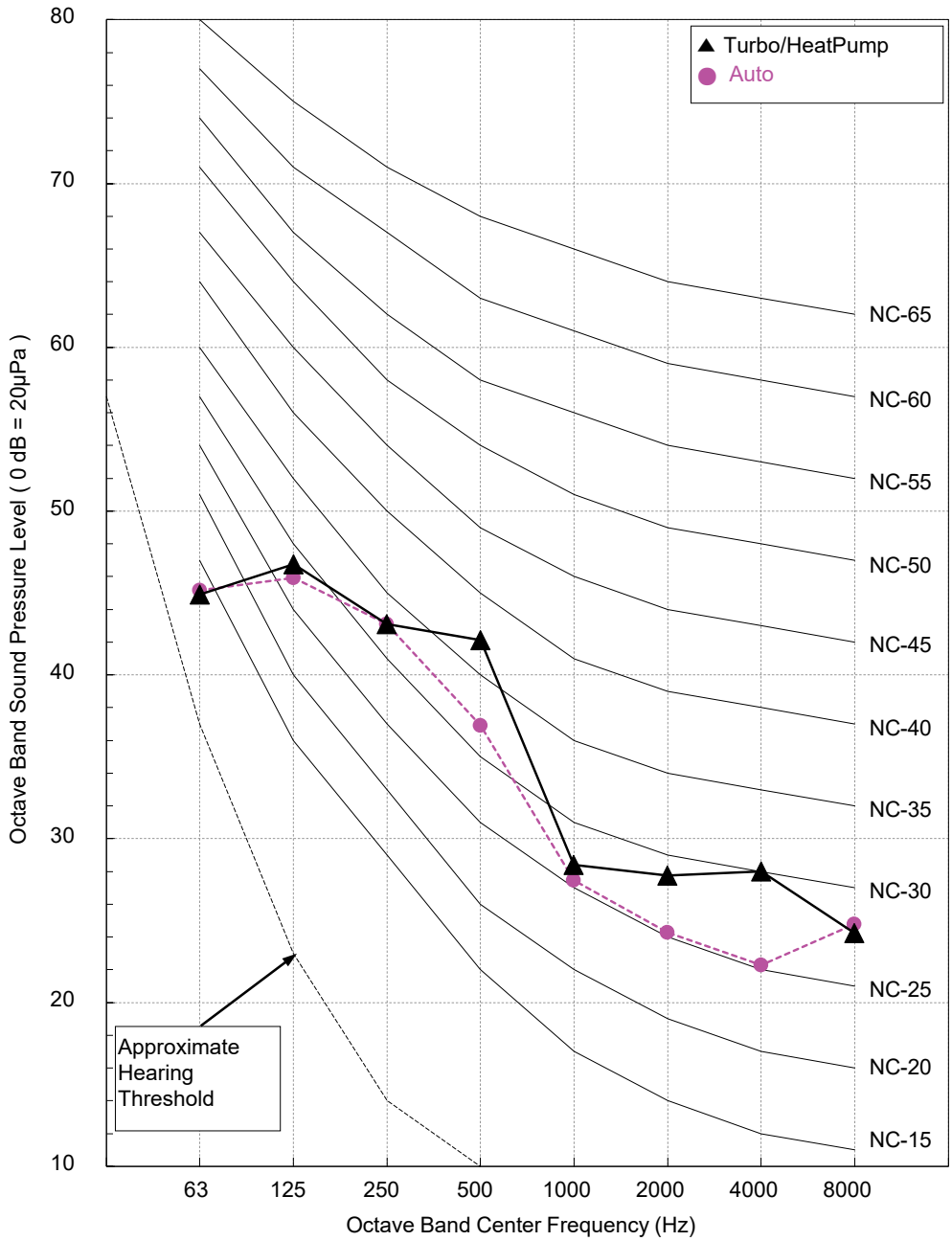
Model	Heating	
	Auto	Turbo/HeatPump
R5TT20F-SA0	40	42

Note
- Sound measured at 1 m away from the unit.
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- Reference acoustic pressure 0dB=20μPa.
- Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment is installed.
- The operating conditions are assumed to be standard.
- Sound pressure level is measured on the rated condition in the anechoic rooms by ISO 3745 standard.
- Sound level is measured in an anechoic room and may be different according to the test condition or equipment.

12. Sound Levels (Reference Data)

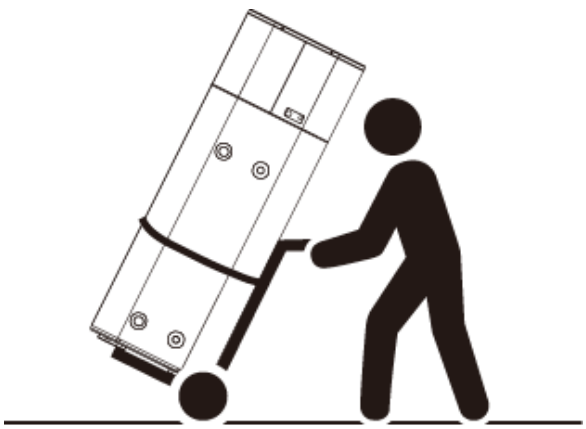
R5TT20F-SA0

Heating



13. Carrying Method

- Moving or installation of the appliance requires two or more people.
- Make sure you both have a good grip before lifting.
- Use an appliance dolly with strap to move the water heater.



SAFETY INSTRUCTIONS

READ ALL INSTRUCTIONS BEFORE USE

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and follow all safety messages.

⚠ This is the safety alert symbol.

This symbol alerts you to potential hazards that can kill or injure you and others.

All safety messages will follow the safety alert symbol and either the word DANGER, WARNING or CAUTION. These words mean:

⚠ CAUTION

You may be slightly injured or cause damage to the product if you do not follow instructions.

⚠ WARNING

You may be killed or seriously injured if you do not follow instructions.

⚠ DANGER

This indicates that the failure to follow the instructions will cause serious injury or death.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what may happen if the instructions are not followed.

⚠ WARNING

To reduce the risk of explosion, fire, death, electric shock, injury or scalding to persons, instructions in this manual must be followed.

Be sure to fully understand the user's manual before you install and operate this appliance. If you have any difficultly in understanding or following the instructions in this manual, or have any questions, contact an authorized service center or the local electric utility.

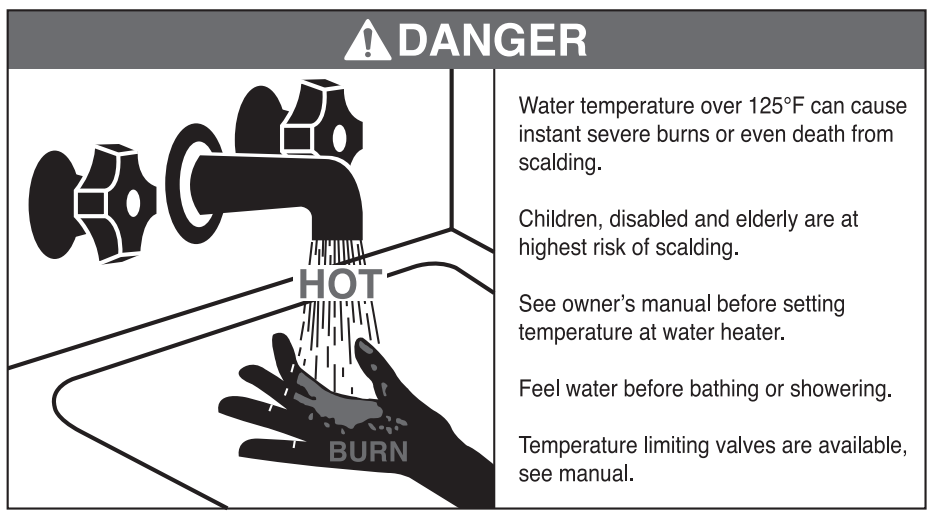
14. Installation

Safety Precaution

Water Temperature Setting

⚠ DANGER

Water temperature above 125°F can cause severe burns instantly or death from scalding. Be sure to read and follow the warnings on the label pictured below. This label is also located on the front of the water heater.



For determining the proper water temperature for your home, refer to the chart below.

Temperature	Time to Produce a Serious Burn
120°F(49°C)	More than 5 minutes
125°F(52°C)	1 ½ to 2 minutes
130°F(54°C)	About 30 seconds
135°F(57°C)	About 10 seconds
140°F(60°C)	Less than 5 seconds
145°F(63°C)	Less than 3 seconds
150°F(65°C)	About 1 ½ seconds
155°F(68°C)	About 1 second

NOTE

- To reduce point of use water temperature, Thermostatic Mixing Valves are recommended. These valves automatically mix hot and cold water in branch water lines. It is recommended to use a mixing valve complying with the Standard for Temperature Actuated Mixing Valves for Hot Water Distribution Systems, ASSE 1017. Contact a qualified person or local plumbing authority for more information.

⚠ DANGER

Households with the elderly, children, or people with disabilities may require a 120°F or lower thermostat setting to prevent contact with "HOT" water.

14. Installation

⚠ DANGER

Higher water temperature increases the potential for Hot Water SCALDS

Water temperature in the heater is regulated by the buttons on display. The water temperature of this water heater is factory set to 120°F to comply with safety regulations. For information about adjusting the water temperature, refer to the operation section in this manual.

For Use in The State of California

The state of California requires that residential water heaters must be braced, anchored or strapped to avoid falling or horizontal displacement during an earthquake. Contact local utilities for code requirements in your area.

Local Installation Regulations

This appliance must be installed accordance with instructions of this manual, local codes, utility codes, utility company requirements or, if there is no local codes, the latest edition of the National Electrical Code.

14. Installation

Important Safety Instructions

⚠ WARNING

To reduce the risk of explosion, fire, death, electric shock, scalding or injury to persons when using this product, follow basic precautions, including the following:

Children in the Household:

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

INSTALLATION

- Be sure your appliance is properly installed in compliance with local codes and the provided installation instructions.
- Do not replace any part of your water heater and use only original accessories and spare part unless it is specifically recommended in this manual.
- Do not turn on the electrical power to water heater unless the tank is completely full of water.
- Never attempt to operate this appliance if it is damaged, malfunctioning, partially disassembled, or has missing or broken parts.
- When the product is soaked (flooded or submerged) in water, contact an Authorized Service Center for repair before using it again.
- To reduce the risk of severe injury or death, follow all installation instructions.
- Moving or installation of the appliance requires two or more people.
- Turn off the power by opening the circuit breaker or removing the fuses before installing.
- Even if the water heater thermostat is set to relatively low, hot water has the potential for scalding. To reduce the risk of scalding, thermostatic mixing valves are recommended.
- Keep packing materials out of the reach of children. Packaging material can be dangerous for children. There is a risk of suffocation.
- Destroy the carton, plastic bag, and other packing materials after the appliance is unpacked. Children might use them for play. Cartons covered with rugs, bedspreads, or plastic sheets can become airtight chambers.
- Connect to a properly rated, protected, and sized power circuit to avoid electrical overload.
- This appliance must be positioned near to an electrical power supply.
- Do not install the water heater on an unstable surface or in a place where there is danger of it falling.
- Contact an authorized service center when installing or relocating water heater.
- Do not install the water heater in a place where flammable liquids or gases such as gasoline propane, paint thinner, etc., are stored.
- This appliance must be properly grounded to minimize risk of electric shock
- The information contained in the manual is intended for use by a qualified service technicia who is familiar with the safety procedures and equipped with the proper tools and test instruments.

14. Installation

- Install the panel and the cover of the control box safely.
- Do not touch heat exchanger fins with your bare hands. Otherwise you may get a cut in you hands.
- Do not input air or gas into the system except with the specific refrigerant.

OPERATION

- Read all instructions before using the appliance and save these instructions.
- Use this appliance only for its intended purpose.
- If the water heater has been subjected to fire, flood or physical damage, disconnect all power to water heater immediately, and DO NOT operate it again until it has been inspected by a qualified person.
- Do not turn on the water heater unless the tank is completely full of water.
- Do not turn on the water heater if cold water supply shut-off valve is closed.
- Feel water before bathing or showering.
- Even at 120°F, hot water can scald.
- Do not block the inlet or outlet of air floor.
- Never touch, operate, or repair the water heater with wet hands.
- Do not leave flammable substances such as gasoline, benzene, or thinner near the water heater.
- Cut off the power supply if there is any noise, smell, or smoke coming from the water heater.
- Make sure that the power cable is neither dirt , loose, nor broken.
- Do not place any objects on the power cable.
- Do not modify or extend the power cable. Scratches or peeling insulation on the power cable may result in fire or electric shock, and should be replaced.
- If the supply cord is damaged, it must be replaced by the manufacturer or its service agents or similarly qualified person in order to avoid a hazard.
- Do not expose people, animals, or plants to the cold wind from the water heater for extended periods of time.

MAINTENANCE

- Do not repair or replace any part of the appliance. All repairs and servicing must be performed by qualified service personnel unless specifically recommended in this owner's manual. Use only authorized factory parts.
- Disconnect this appliance from the power supply before cleaning and attempting any user maintenance.
- Before draining water heater, turn off the power to product.
- Do not turn on the electrical power to the water heater unless the tank is completely full of water.

14. Installation

⚠ CAUTION

To reduce the risk of minor injury to persons, malfunction, or damage to the product or property when using this product, follow basic precautions, including the following:

INSTALLATION

- Install the product on a firm and level floor.
- Do not install the water heater in a place where leakage of the tank or connections will result in damage to the area adjacent to it or to lower floors of the structure. Where such areas cannot be avoided, it is recommended that a suitable drain pan, adequately drained, be installed under the water heater.
- Install the water heater in a place where the noise from the water heater will not inconvenience the neighbors.
- Install the drain hose properly for the smooth drainage of water condensation.
- Be sure to check if there is a refrigerant leak after installing or repairing the water heater.
- To reduce the risk of excessive pressures and temperatures in this water heater, install temperature and pressure protective equipment required by local codes and no less than a combination temperature and pressure relief valve certified by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials, as meeting the requirements for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems, ANSI Z21.22. This valve must be marked with a maximum set pressure not to exceed the marked maximum working pressure of the water heater. Install the valve into an opening provided and marked for this purpose in the water heater, and orient it or provide tubing so that any discharge from the valve exits only within 6 inches above, or at any distance below, the structural floor, and does not contact any live electrical part. The discharge opening must not be blocked or reduced in size under any circumstances.

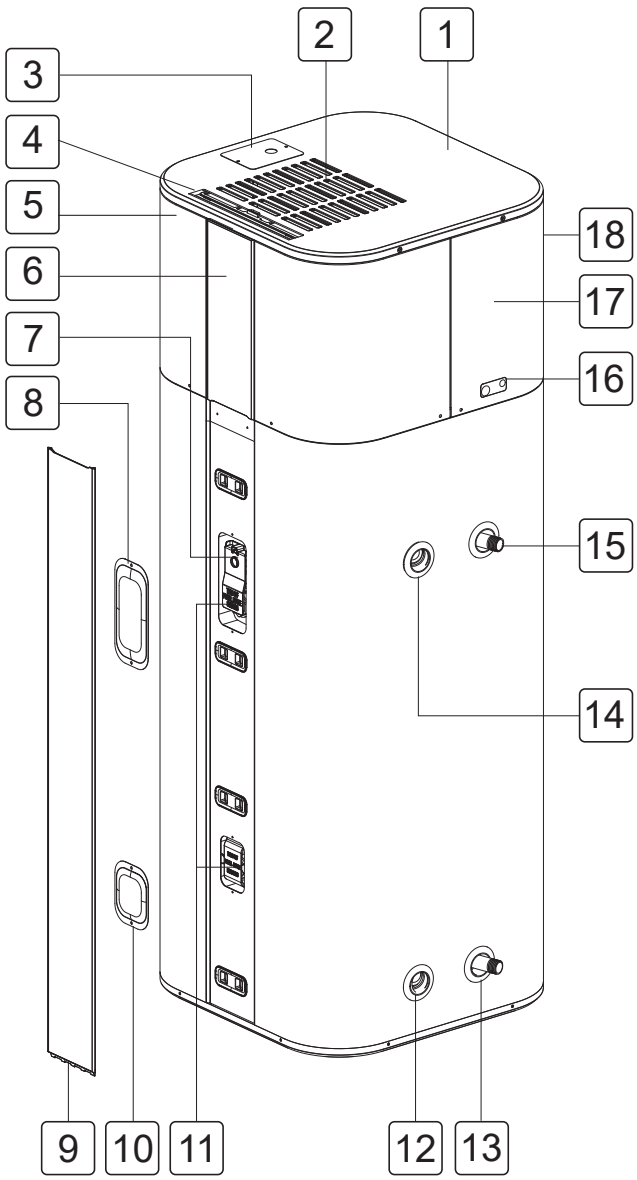
OPERATION

- Do not place objects on top of the appliance.
- Do not use this appliance if any part have been under water. Immediately contact an Authorized Service Center for replace flooded water heater. Do not attempt to repair the unit. It must be replaced.
- Turn off the power and water supply to water heater and drain water heater if the appliance is to be left for an extended period of time, such as during vacations.
- Hydrogen gas is produced in a hot water system served by this heater that has not been used for a long period of time (2 weeks or more). HYDROGEN GAS IS EXTREMELY FLAMMABLE. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for several minutes at the kitchen sink before using any electrical appliance connected to the hot water system. When hydrogen is present, there will probably be an unusual sound such as air escaping through the pipe as the water begins to flow. There should be no smoking or open flame near the faucet at the time it is open.

SAVE THESE INSTRUCTIONS

INSTALLATION

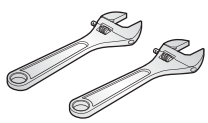
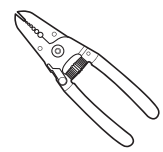
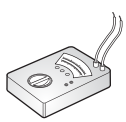
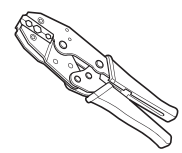
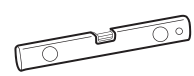
Parts and Functions



1. Top cover
2. Air intake vents
3. Junction box
4. Air filter
5. Front panel
6. Display décor / Control panel
7. ECO
8. Upper element cover
9. Front décor
10. Lower element cover
11. Heating element
12. Opening for drain valve
13. Water inlet
14. Opening for T&P relief valve
15. Water outlet
16. Condensate drain
17. Rear panel
18. Air outlet Vents

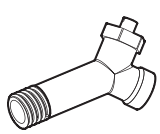
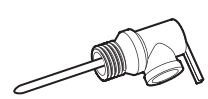
14. Installation

Installation Tools

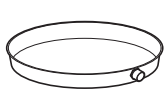
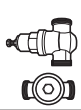
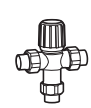
Figure	Name	Figure	Name
	Screw driver		Teflon tape
	Spanner		Wire stripper
	Multi-meter		Hand crimper
	Crimp cap		Level

Accessories

Included Accessories:

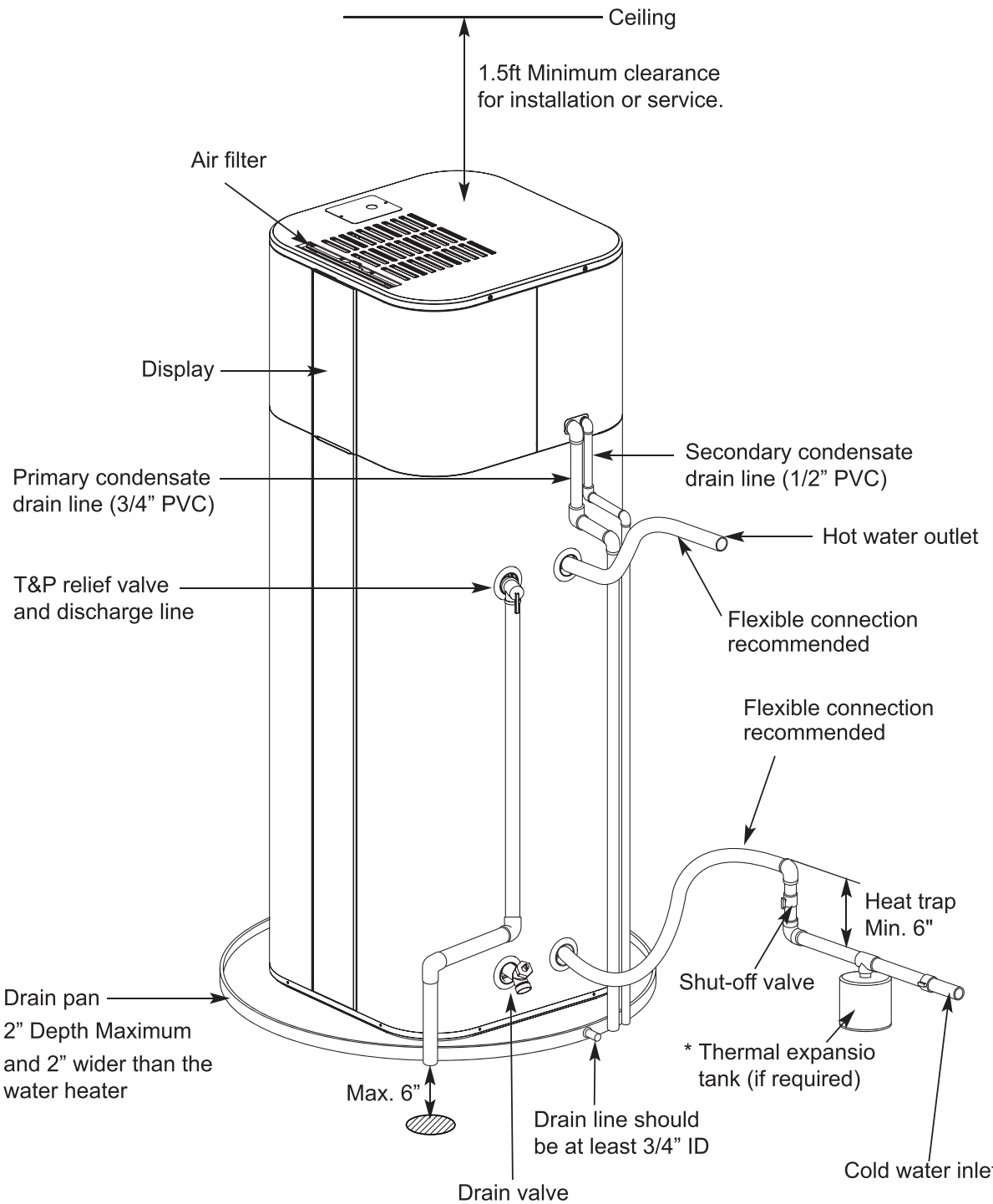
Figure	Name	Figure	Name
	Drain valve		T&P relief valve

Recommended Accessories:

Figure	Name	Figure	Name
	Drain pan		Thermal expansion tank
	Pressure reducing valve		Thermostatic mixing valve
	Dielectric Union		

14. Installation

Installation Instructions



* In closed system, connect a thermal expansion tank to cold water supply line
  See “Thermal Expansion” Section (p.13).
* If copper piping is used, The dielectric unions(field supply) must be installed at the water connections.

14. Installation

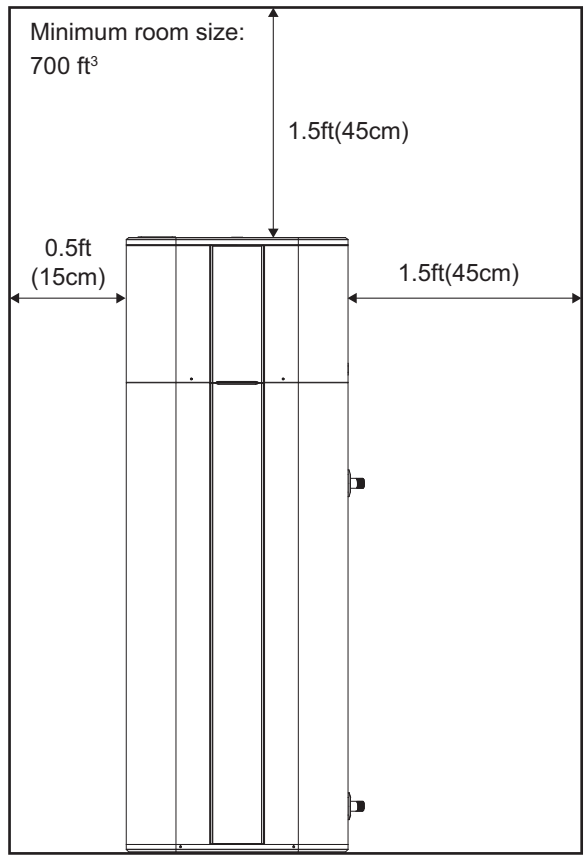
Select the best Location

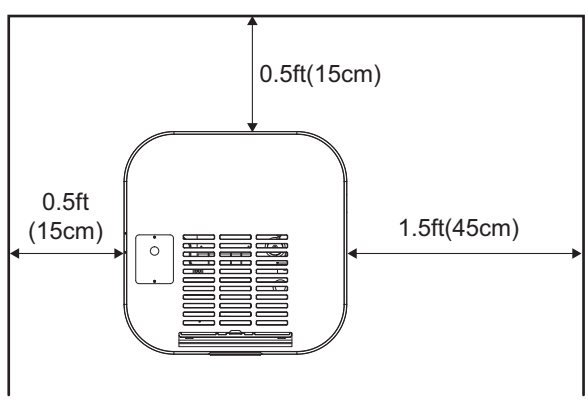
NOTE

- Installation in a confined space without proper ventilation will lead to higher power consumption.
- Auxiliary drain pan MUST be installed in compliance with local codes.
  Drain pan kits are available from the store where the water heater purchased, or any water heater distributor.
  Drain pan should not obstruct cold water inlet or drain valve.

- Select space where has enough space for periodic servicing. The air filter, covers, and front panels can be removed to permit inspection and servicing.
- Take the weight of the water heater into account and select a place where the floor is strong enough to support the weight of full water heater.
- The water heater and water lines should be protected from freezing and high corrosive elements. Do not install water heater in outdoor or unprotected areas.
- Install the water heater close to the area of greatest heater water demand and the center of plumbing system. Long un-insulated hot water lines can waste energy.
- Insufficient air exchange will result in increased energy consumption level.
- The installation site must be over 34 °F(1 °C).

Minimum Clearances





NOTE

- For future service, a minimum 3 feet clearanc between any object and the left, right and back side is recommended.

14. Installation

Unpacking and Removing Shipping Bolts

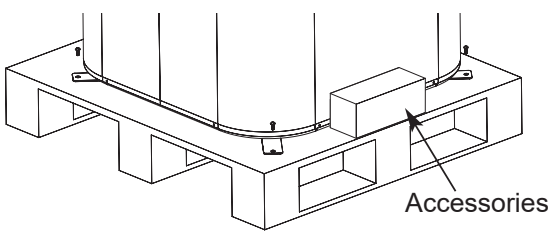
NOTE

- Accessories (drain valve and T&P relief valve) are attached on pallet. Keep it for installation.

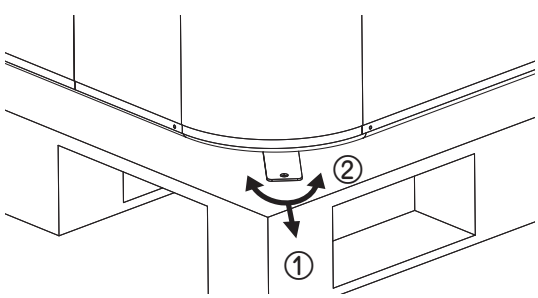
Unpack all shipping materials from the water heater for proper operation and inspect it for shipping damage.

1 Remove carton and shipping materials.

2 Remove the screws from the shipping brackets.



3 Pull out the shipping brackets.



4 Slightly tip the water heater and carefully roll the water heater off the pallet.

Thermal Expansion

Determine if a check valve is present on the inlet water line. Check with your local water utility. A check valve located in cold water inlet line will create a “closed water system”. As water is heated, it creates an increase in pressure within the water system because the increased volume of water doesn’t have a place to go.

Referred to as “thermal expansion”, the rapid pressure increase can quickly reach the safety setting of the relief valve. This will cause the relief valve to open during each heating cycle. We recommend installing an expansion tank to control thermal expansion.

Connect the thermal expansion tank to the cold water supply line (see Installation Instructions). For additional information, contact installing contractor, plumbing inspector, or water supplier.

14. Installation

Installing Drain Pan

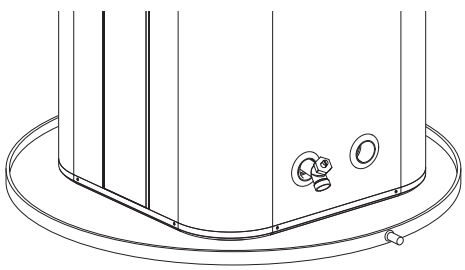
NOTE

- Most codes require placing the water heater on a suitable drain pan piped to an adequate drain.

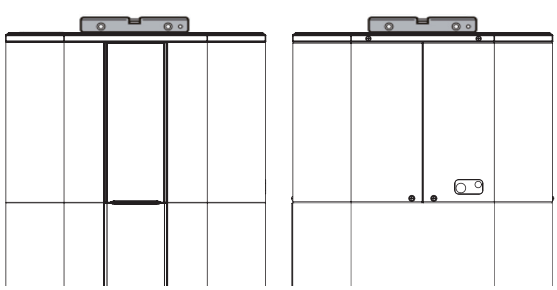
The drain pan helps to prevent property damage which may occur from condensation or leaks in the piping connections or tank.

1 Install a suitable drain pan piped to an adequate drain.

2 Place water heater on drain pan.



3 Ensure the water heater is horizontal using a spirit level.



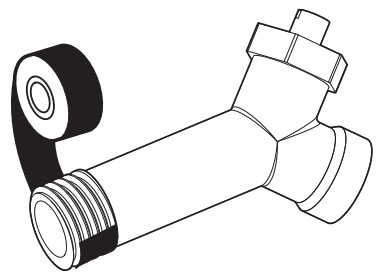
NOTE

- Drain valve and T&P relief valve is included in packing box of the water heater.
  They must be installed in the opening provided for this purpose.

Installing Drain Valve

Use drain valve included in packing.

1 Apply Teflon tape on the NPT end to prevent leaking.

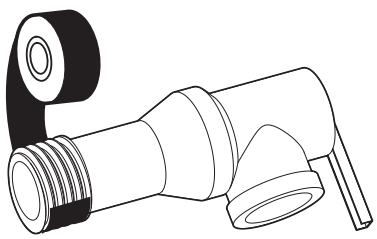


2 Install the drain valve in the opening marked “Drain Valve”.

Installing T&P Relief Valve

Use T&P relief valve included in packing.

1 Apply Teflon tape on the NPT end to prevent leaking.



2 Install the T&P relief valve in the opening marked T&P relief valve.

Connecting T&P Relief Valve Discharge Pipe

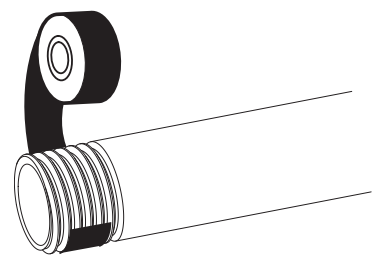
> **⚠ WARNING**
>
> **The pressure rating of the relief valve must not exceed 150PSI, the maximum working pressure of the water heater as specified on the data plate.**

> **⚠ WARNING**
>
> **DO NOT connect any valve or other restriction to the T&P plumbing. DO NOT connect the T&P plumbing to the condensate plumbing. It must be directly piped to an adequate open drain.**

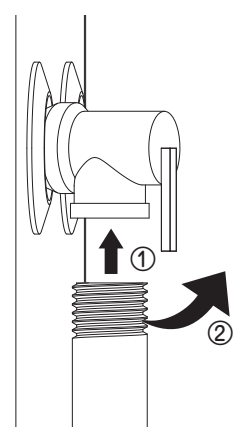
Install T&P Relief Valve discharge pipe according to local codes and the following instructions.

- The inside diameter of the discharge pipe must be at least 3/4“.
- The discharge pipe must be approved for hot water distribution and withstand 210°F without distortion.
- The end of the discharge pipe should not be threaded or concealed and should be protected from freezing.
- Do not insert or install any type of valve, restriction, or reducer coupling in the discharge pipe.

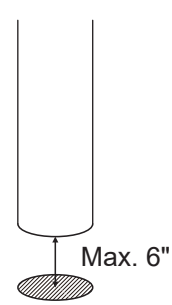
1 Apply Teflon tape on the NPT end to prevent leaking.



2 Attach the discharge pipe to outlet of the T&P relief valve. The discharge pipe must pitch downward from the valve to allow complete drainage of both T&P relief valve and discharge pipe.



3 The end of the discharge pipe must stop no more than six inches above the floor drain or outside.



Installing Condensate Drain Lines

NOTE

- When making drain fitting connections to the drain tubing, DO NOT overtighten. Overtightening fittings could crack or damage the condensate drain pan.
- Condensate from this unit is not acidic.

The condensate drain lines and connections to the drain piping must meet state and local codes.

Do not reduce the drain line size to less than the condensate connection size provided.

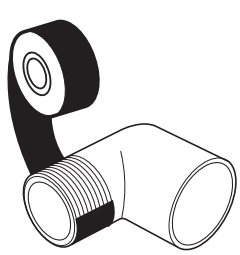
Ensure that the condensate drain lines maintain a downward slope for proper drainage.

The drain line should be insulated to prevent condensation from forming on the outside of the drain line.

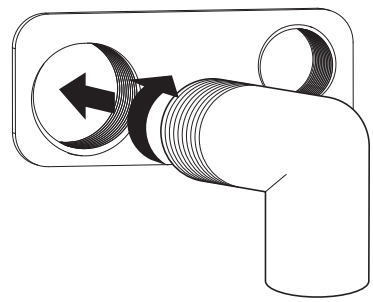
Do not allow condensate to drain into water heater drain pan.

If no floor drain is available or the drain is above the level of the condensate line, then a common condensate pump with a capacity no less than 2 gallon per day must be installed.

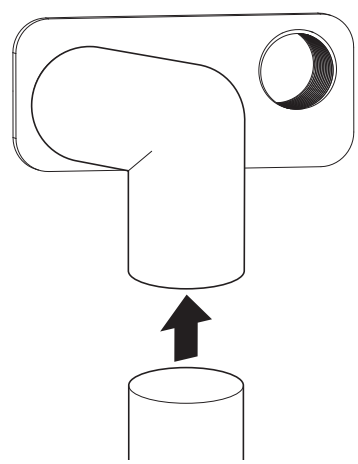
1 Apply Teflon tape on the NPT end to prevent leaking.



2 Attach elbow with 3/4” slip &3/4”NPT to the primary drain connection.



3 Using an approved sealant, insert the PVC pipe into the female end. Condensate drain must be piped to an adequate drain.



4 Using 1/2“ PVC piping, a elbow with 1/2“ slip & 1/2“ NPT, and an approved sealant, attach the elbow to secondary drain connection and insert the PVC pipe into the female end.

Connecting the Water Supply

NOTE

• DO NOT directly solder or braze to hot or cold water connections. If sweat connections are used, sweat tubing to adapter before installing the adapter to the hot or cold water connections on heater. Any heat applied to the water supply fittings will permanently damage the internal plastic lining in these ports.

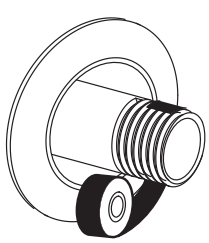
Refer to “Installation Instructions” for suggested typical installation.

1 Check the type of water pipes in your home. Use fittings adequate for the type of pipe in your home.

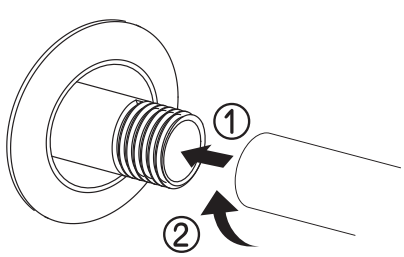
If cooper piping used, The water heater should always be connected dielectric connections (field supply) to avoid corrosion caused by electric currents common in copper water pipes.

For ease of disconnecting the water heater for service or replacement, the installation of unions is recommended on the water connections.

2 Apply Teflon tape on the NPT end to prevent leaking.



3 Connect cold and hot water supply using 3/4” NPT.



4 Install a shut-off valve in the cold water line near the water heater.

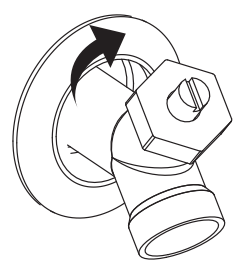
5 Install the insulation on the cold and hot water pipes. Insulating hot water pipe can increase energy efficiency.

To Fill the Water Heater

⚠ WARNING

Do not turn on the electrical power to water heater unless the tank is completely full of water. The water heater warranty does not cover damage or failure resulting from operation with empty or partially empty tank.

1 Make sure that the drain valve on water heater is completely closed.



2 Turn on the cold water supply

3 Open each hot water faucet slowly and allow the water to run until it flows with a full stream.

4 Let the water run full stream for a few minutes.

Making Electrical Connections

> **⚠ WARNING**
>
> **Disconnect all power before working on any electrical connections.**

NOTE

- All wiring must conform to local codes or National Electrical Code ANSI/NFPA 70.

A separate branch circuit with copper conductors, overcurrent protective device and suitable disconnecting means must be provided by a qualified electrician.

The voltage requirements and wattage load for the water heater are specified on the data plate on the front of the water heater.

Ensure that the fusing or circuit breaker is proper size for this water heater

(Recommended 30 amp breaker).

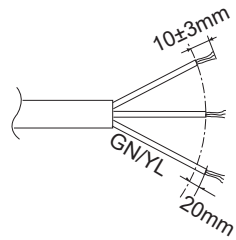
The branch circuit wiring should include either:

1. Metallic conduit or metallic sheathed cable approved for use as a grounding conductor and installed with fittings approved for the purpose.

2. Non-metallic sheathed cable, metallic conduit or metallic sheathed cable not approved for use as a ground conductor shall include a separate conductor for grounding. It should be attached to the ground terminals of the water heater and the electrical distribution box.

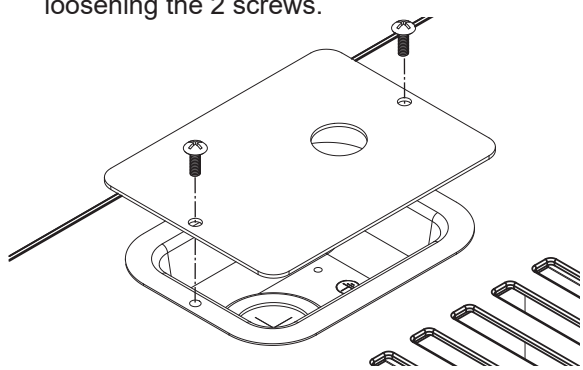
NOTE

- Use flexible conduit only.
- Use crimp type connector for wiring.
- The ground wire should be longer than th common wires.

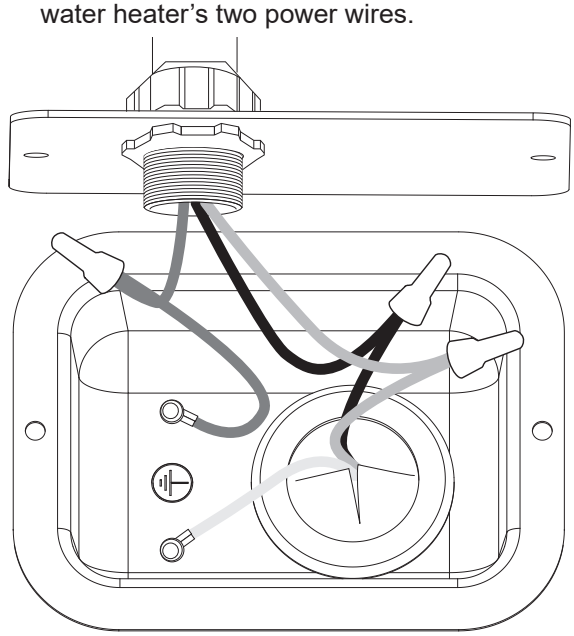


1. Make certain the electrical power is turned off.

2. Remove junction box cover from the unit by loosening the 2 screws.



3. Connect the ground to the green ground wire, and the home's two power wires to the water heater's two power wires.



14. Installation

Safety Controls

> **⚠ CAUTION**
>
> **You must have a qualified person investigate the cause of the high temperature condition and take corrective action before placing the water heater in service again.**

There is temperature limiting control(ECO) that is located above the upper heating element. If the water temperature becomes excessively high, the temperature limiting control(ECO) shuts off the power to the heating elements.

Once the control opens, it must be reset manually.

To reset temperature limiting control(ECO):

1. Turn off the power by opening the circuit breaker or removing the fuses.
2. Remove the front décor and upper element cover.
3. Press the red ECO RESET button.

Insulation Blanket Kits

External insulation blanket, available to the general public, for water heater is not necessary.

The manufacturer's warranty does not cover any damage or failure caused by installing or using any type of unauthorized energy-saving or other devices.

The manufacturer is not responsible for any injury or loss resulting from the use of such unauthorized devices.

> **⚠ CAUTION**
>
> **If local codes require application of any external insulation blanket kit to water heater, it will require careful attention so as not to restrict the proper function and operation of this appliance:**
>
> - DO NOT block the air openings of the water heater.
> - DO NOT cover or attempt to relocated the information or warning labels attached to the water heater.
> - DO NOT cover the control panel, T&P relief valve, drain valve, and junction box.
> - Inspect the blanket frequently.

14. Installation

Installation Checklist

Location

- Sufficient room for air exchange and periodic service.
- Floor is strong enough to support water heater.
- Indoor and protected from high corrosive elements.
- Close to the area of heater water demand.
- Over 34 °F(1 °C).
- Area free of flammable liquids and gases.

Drain valve

- Drain valve properly installed.

T&P relief valve

- T&P relief valve properly installed.
- Discharge line maintains a downward slope and runs to adequate drain.
- Discharge pipe protected form freezing.

Condensate Drain

- Drain lines maintain a downward slope and run to adequate drain.

Water supply

- Tank is completely full of water.
- Remove air from water heater and piping.
- Water connections tight and free of leakage but DO NOT overtighten.
- If cooper piping used, connect the dielectric unions(field supply) to prevent corrosion.
- Flexible water connections recommended.

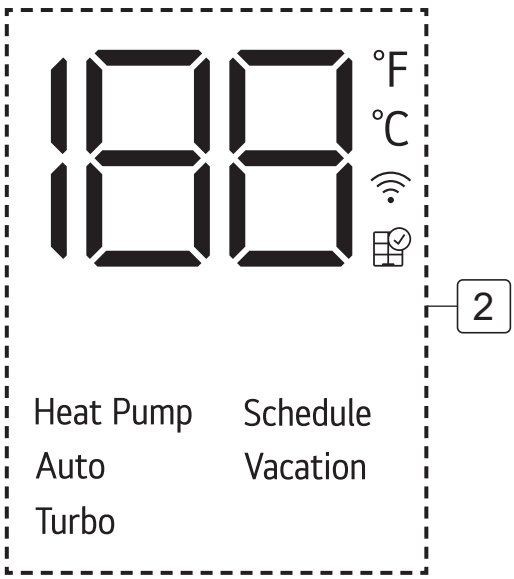
Wiring

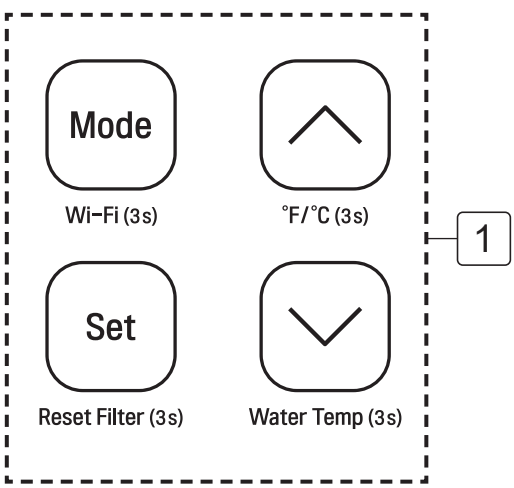
- Power supply voltage agree with rating voltage on data plate.
- Proper size of branch circuit wire and fusing or circuit breaker.
- Unit properly grounded.

15. Controller

Using Basic Control

DISPLAY SCREEN





1 Button	2 Display Screen	Description
Mode	Heat Pump	To select the heat pump mode.
	Auto	To select the auto mode.
	Turbo	To select the turbo mode.
	Vacation	To select the Vacation mode.
-	Schedule	Set schedule mode only in LG ThinQ application.
Set	-	To set the desired water temperature.
^ v	188	To adjust the desired water temperature.
Wi-Fi (3s)		To enable the Wi-Fi pairing.
Reset Filter (3s)		To reset the filter alarm.
°F/°C (3s)	°F °C	To change unit between °F and °C.
Water Temp (3s)	188	To display the current water temperature for 5 seconds.

15. Controller

Water Temperature Adjustment

⚠ DANGER

Higher water temperature increases the potential for Hot Water SCALDS.

The water temperature will be maintained according to the setting temperature on Display and can be adjusted from 95°F to 140°F.

1 Press ⌃ or ⌄ button to select the water temperature.

2 Press **Set** button to finish.

Operation Mode

• Press **Mode** button repeatedly to select the operating mode.

The active mode is displayed on the display screen.

HEAT PUMP MODE

This mode minimizes power consumption by using only heat pump for heating, but has low recovery.

AUTO MODE

This mode is factory set mode for shipping.

This mode provides relatively low power consumption and high recovery. This mode primary uses heat pump for heating.

Heating elements will provide supplementary heating, if demand is more than the heat pump can keep up by itself.

TURBO MODE

This mode provides the highest recovery. This mode uses heat pump and heating element simultaneously.

VACATION MODE

This feature is recommended when the water heater is not in used for an extended period of time. In this mode, tank temperature will be maintained at about 68 °F(20 °C) to minimize energy consumption and prevent the water heater from freezing.

The vacation duration can be set or modified between 1 and 90 days via LG ThinQ app.

⚠ CAUTION

Hydrogen gas can be produced in a hot water system when it is no used for a long period (generally two weeks or more). HYDROGEN GAS IS EXTREMELY FLAMMABLE.

Reset the Air Filter Alarm

The device will display alarm ( ) reminding you to check and clean the air filter periodically.

• Press and hold **Set** button about 3 seconds to reset the alarm.

Change Temperature Unit

Temperature unit display on Screen can be set to Fahrenheit or Celsius

• Press and hold ⌃ button about 3 seconds to change temperature unit.

Current water Temperature

• Press and hold ⌄ button about 3 seconds

Display will show current water temperature of the tank for 5 seconds.

Wi-Fi PAIRING FUNCTION

Once it is connected to the internet through a home Wi-Fi network, you can control the appliance remotely with the application for the smart phone. See “SMART FUNCTION” section for details.

• Press and hold **Mode** button about 3 seconds.
is displayed on the display screen.

Air Solution
http://partner.lge.com

The air conditioners manufactured by LG have received ISO9001 certificate for quality assurance and ISO14001 certificate for environmental management system. The specifications, designs, and information in this brochure are subject to change without notice.