Commercial Water Heaters

from

WORLD'S NO.1

Manufacturer of Water Heaters

Green Power & Company
Total Water Solutation

A.O. Smith®
Innovation has a name.

A.O. Smith
Innovation has a name.

Green Power & Company
Total Water Solutation

HPW

Air to Water Heat Pump

Storage Capacity - 60 & 80 litres

THE HIGH EFFICIENCY REVOLUTION IS HERE!

HPW

The HPW heat pump water heater is an integrated wall hung system that utilises the heat pump technology to provide efficient way to heat water withelectricity. HPW pulls heat from surrounding air and deposits the heat into the tank. The end result is hot water with cooler and dehumidified air as a welcome by-product.

PRODUCT FEATURES:

Energy Saving Heating:
The New generation water heater extracting heat from the atmosphere and using it for heating water.

Max:
MAX function for more hot water output, therefore better bathing experience.

AES (adaptive energy-saving system):
AES feature adopts heating cycle automatically, which will facilitate water usage and save energy by minimizing thermal loss.

Hot water amount display:
Indicates the amount of hot water available in the tank.

Glass-lined special protective tank:
Patented glass-Lined protection by A. O. Smith for better tank life.

Anode rod protection:
A powerful steel-core-anode rod to protect tank and prolonged service life of the heat pump water heater.

High efficiency Energy Saving Insulation:
A polyureathane foam insulating layer reduces heat loss effectively.

ALL ROUND SAFETY

- Triple protection - Thermostat, High temperature limit and T&P relief valve.
- Refrigerant and water are completely separated, condenser uses rectangular steel tubes.
- Compressor overheating protection
- High and low voltage protection
- Refrigerant leakage protection

SMART & CONVENIENT

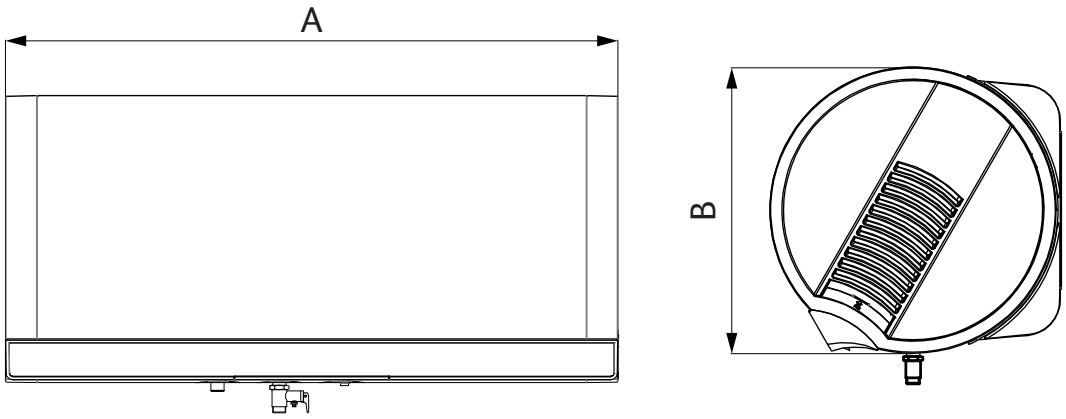
- LCD touch pad display
- Intuitive icons clearly indicate the current operating mode
- Three line display communicates current status and displays error messages in plain English when applicable.
- Safety lock
- Individual back lit buttons for mode selection

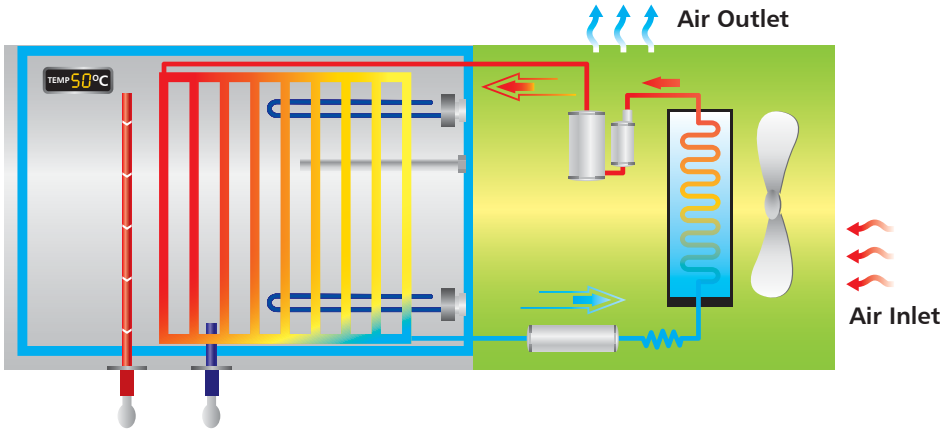
LCD remote

TECHNICAL SPECIFICATIONS - HPW

MODEL	HPW-60A2	HPW-80A2
Rated volume [L]	60	80
Rated voltage [V] / Rated frequency [Hz]	220 / 50	220 / 50
Rated input power [W] / Rated current [A]		
Efficiency mode	210 / 0.95	210 / 0.95
Hybrid Turbo mode	2200 / 10	2200 / 10
MAX mode	3000 / 13.7	3000 / 13.7
Heating Capacity [W]		
Efficiency mode	540	540
Hybrid Turbo mode	2540	2540
MAX mode	3000	3000
Inner tank rated pressure [MPa]	0.8	0.8
Range of water temperature [°C]	35-75	35-75
Environment range of energy-saving mode [°C]	10-44	10-44
Dimensions [A x B] [mm]	837 x 473	992 x 473
Net weight [kg]	42	45

EXTERNAL DIMENSIONS





A.O. Smith®
Innovation has a name.

Green Power & Company
Total Water Solutation

CAHP

Air to Water Heat Pump

Storage Capacity - 300 & 455 litres

THE HIGH EFFICIENCY REVOLUTION IS HERE!

CAHP

The CAHP heat pump water heater is an integrated system that utilises the heat pump technology to provide efficient way to heat water with electricity. CAHP pulls heat from surrounding air and deposits the heat into the tank. The end result is hot water with cooler and dehumidified air as a welcome by-product.

FEATURES:

ENERGY SAVING & ENVIRONMENT FRIENDLY

- Absorbs Environment heat and transfers it to the water, at the same time cooling and dehumidifying the ambient air.
- "Environmental-friendly" R-134a refrigerant.
- Multiple operating modes maximise efficiency & meet increasing hot water needs.
- High capacity storage tank enables heat pump to operate more frequently than the heating elements. This provides higher efficiency & cover operating costs, saving money for the home owner.

ALL ROUND SAFETY

- Triple protection - Thermostat, High temperature limit and T&P relief valve.
- Refrigerant and water are completely separated, condenser uses rectangular steel tubes.
- Water can be heated upto 65°C on heat pump mode, which prevents breeding of Legionella bacteria.
- Compressor overheating protection
- High and low voltage protection
- Refrigerant leakage protection

SMART & CONVENIENT

LCD remote

- Large LCD touch pad display
- Intuitive icons clearly indicate the current operating mode
- Three line display communicates current status and displays error messages in plain English when applicable.
- Safety lock
- Individual back lit buttons for mode selection

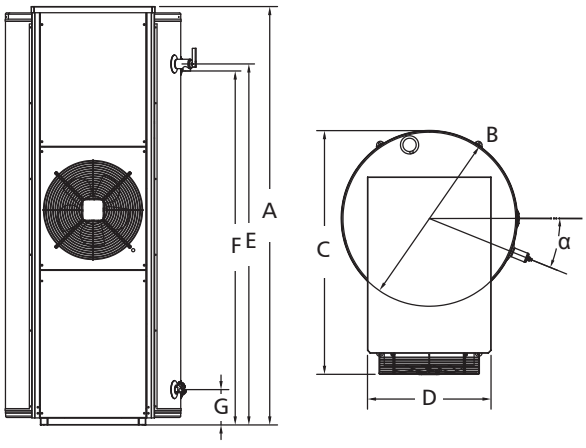
COMMERCIAL-GRADE GLASS TANK LINING

A. O. Smith's Blue Diamond® glass coating is a patented commercial-grade formula that provides superior tank protection and corrosion resistance compared to the industry standard glass lining. Blue Diamond glass coating blend is formulated in the same lab that creates the protection for our industry- leading commercial product line. Through our long history, we've learned that one size rarely fits all. That's why we customize our signature formula to best meet the needs of every water heater we produce, ensuring long life no matter which A. O. Smith model you choose.

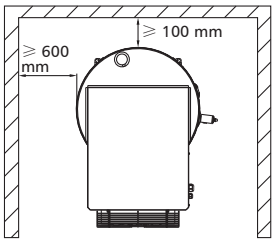
TECHNICAL SPECIFICATIONS - CAHP 1.5DI - 80/120

Model			CAHP1-5DI-80-6	CAHP1-5D-120-6	CAHP1-5D-120-12
Model Type		/	Outdoor integrated heat pump water heater		
HP Rated Power		W	875		
HP Rated heating capacity		W	3680		
COP		W/W	4.20		
Electrical Heating Capacity		W	6000	6000	12000
Maximum Operation Current	400V / 3N / 50Hz	A	/	/	37.5
	230V / 1N / 50Hz	A	38.7	38.7	71.9
Refrigerant		/	R134a		
Refrigerant charge quantity		g	940		
Tank capacity		L	300	455	455
Net Weight		Kg	161	194	194
Operation Weight		Kg	461	649	649
Water Temp in efficiency mode		°C	65		
Operation Temperature Range		°C	37~75		
Ambient Temperature for HP		°C	-7~43		
Ambient Temperature for Unit		°C	-15~50		
Unit Operation Noise		dB (A)	54		
Air Outlet Noise		dB (A)	58		
Demison (LxWxH) mm		mm	910x610x1700	1012x713x1700	1012x713x1700
Anode		/	Aluminum Rod		
Control Mode		/	Led wire Display (Standard 10m, Optional Maxium 30 m)		
Operation Mode		/	Efficiency, High Demand, Standard		
Other Control Functions			/ Timer, Fault Alarming, Water pump controlling, AES HP		
Power Supply Specifications		/	230V~50Hz	230V~50Hz	400V 3N~50Hz
Connection Size ~ Inlet / Outlet / T&P Valve		/	NPT 3/4 (Female Thread)		

EXTERNAL DIMENSIONS



INSTALLATION DIAGRAM



- During installation, the minimum distance between the air outlet and the barrier should be 800mm
- The heat pump electric water heater should be placed on a refractory base that is over 100mm of height
- If installed in a confined space, the indoor space should not be less than 26m³

EXTERNAL DIMENSIONS

Model	Total height A (mm)	Tank diameter B (mm)	Maximum depth C (mm)	Width from the gate D (mm)	safety valve Interface height E (mm)	Water inlet height G (mm)
CAHP-80	1700	610	910	503	1440	145
CAHP-120	1700	713	1012	503	1467	144

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Green Power & Company
Total Water Solutation

CAHP - 3HP

Air to Water Heat Pump

Storage Capacity - 450 litres

THE HIGH EFFICIENCY
REVOLUTION
IS HERE!

CAHP - 3HP

The CAHP heat pump water heater is an integrated system that utilises the heat pump technology to provide efficient way to heat water with electricity. CAHP pulls heat from surrounding air and deposits the heat into the tank. The end result is hot water with cooler and dehumidified air as a welcome by-product.

FEATURES:

ENERGY SAVING & ENVIRONMENT FRIENDLY

- Absorbs Environment heat and transfers it to the water, at the same time cooling and dehumidifying the ambient air.
- "Environmental-friendly" R-134a refrigerant.
- Dual operating modes maximise efficiency & meet increasing hot water needs.
- High capacity storage tank enables heat pump to operate more frequently than the heating elements. This provides higher efficiency & cover operating costs, saving money for the home owner.

ALL ROUND SAFETY

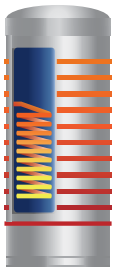
- Triple protection - Humidity sensor, built-in Anti-dry & Anti-frost function.
- Water can be heated upto 65°C with heat pump mode, which prevents breeding of Legionella bacteria.

SMART & CONVENIENT

LCD remote

- Large LCD touch pad display which communicates current status and displays error messages in plain English when applicable.
- Intuitive icons clearly indicate the current operating mode

HIGH EFFICIENCY CONDENSER



Dual Condenser

- Internal & external two stage coil condenser. The external coil preheats the cold water at the bottom of the tank, there by improving the energy efficiency of the unit.

COMMERCIAL-GRADE GLASS TANK LINING

A. O. Smith's Blue Diamond® glass coating is a patented commercial-grade formula that provides superior tank protection and corrosion resistance compared to the industry standard glass lining. Blue Diamond glass coating blend is formulated in the same lab that creates the protection for our industry- leading commercial product line. Through our long history, we've learned that one size rarely fits all. That's why we customize our signature formula to best meet the needs of every water heater we produce, ensuring long life no matter which A. O. Smith model you choose.

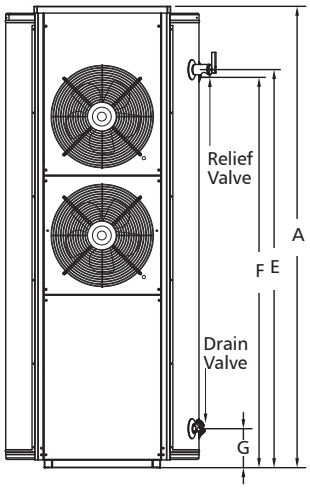
CAHP - 3HP

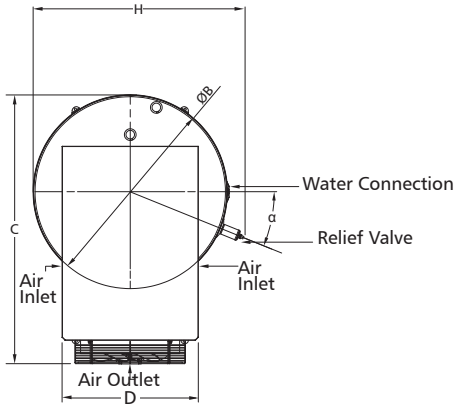
TECHNICAL SPECIFICATIONS-CAHP-120C

Model			CAHP120C-6	CAHP120C-12
Model Type		/	Outdoor integrated heat pump water heater	
HP Rated Power		W	2250	
HP Rated heating capacity		W	8500	
COP		W/W	3.8	
Electrical Heating Capacity		W	6000	12000
Maximum Operation Current	400V / 3N / 50Hz	A	15.8	31.5
	230V / 1N / 50Hz	A	47.1	78.5
Refrigerant		/	R134a	
Refrigerant charge quantity		g	2100	
Tank capacity		L	455	
Net Weight		Kg	264	
Operation Weight		Kg	719	
Water Temp in efficiency mode		°C	65	
Operation Temperature Range		°C	35~82	
Ambient Temperature for HP		°C	0~48	
Ambient Temperature for Unit		°C	-5~50	
Unit Operation Noise		dB (A)	59	
Air Outlet Noise		dB (A)	62	
Demison (LxWxH) mm		mm	1002x770x1717	
Anode		/	Aluminum Rod	
Control Mode		/	Led wire Display (Standard 10m, Optional Maxium 30 m)	
Operation Mode		/	Efficiency, High Demand	
Other Control Functions		/	Timer, Fault Alarming, Anti freezing, Water pump controlling	
Power Supply Specifications		/	230V/1N/50Hz and 400V/3N/50Hz	
Connection Size ~ Inlet / Outlet		/	1Inch (Female Thread)	

Heat pump performance is the mean performance under condition* 20(dry bulb)/15(wet bulb) Cambient temperature and 15°C to 55°C water temperature*

External dimensions





EXTERNAL DIMENSIONS

Model	Total height A (mm)	Tank diameter B (mm)	Maximum depth C (mm)	Service panel width D (mm)	Relief valve height E (mm)	Water outlet height F (mm)	Water inlet height G (mm)	Relief valve angle α (°)	Maximum width H (mm)
CAHP-120C	1770	711	1002	600	1476	1468	153	22	770

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Total Water Solutation

HPI

Air to Water Heat Pump

Storage Capacity - 150 & 180 litres

THE HIGH EFFICIENCY REVOLUTION IS HERE!

HPI

The HPI heat pump water heater is an integrated systemt that utilises the heat pump technology to provide efficient way to heat water with electricity. HPI pulls heat from surrounding air and deposits the heat into the tank. The end result is hot water with cooler and dehumidified air as a welcome by-product.

PRODUCT FEATURES:

Energy Saving Heating:
The New generation water heater extracting heat from the atmosphere and using it for heating water.

Max:
MAX function for more hot water output, therefore better bathing experience.

AES (adaptive energy-saving system):
AES feature adopts heating cycle automatically, which will facilitate water usage and save energy by minimizing thermal loss.

Hot water amount display:
Indicates the amount of hot water available in the tank.

Intelligent defrosting:
The automatic intelligent deforst function solves the problems like freezing of exchanger, frosting and resumes the system to operate efficiently.

Wired remote controller:
The controller and the uint are to be installed seperately for clear view sight and conveient operation.

Glass-lined special protective tank:
Patented glass-Lined protection by A. O. Smith for better tank life.

Anode rod protection:
A powerful steel-core-anode rod to protect tank and prolonged service life of the heat pump water heater.

High efficiency Energy Saving Insulation:
A polyureathane foam insulating layer reduces heat loss effectively.

ALL ROUND SAFETY

- Triple protection - Thermostat, High temperature limit and T&P relief valve.
- Refrigerant and water are completely separated, condenser uses rectangular steel tubes.
- Compressor overheating protection
- High and low voltage protection
- Refrigerant leakage protection

SMART & CONVENIENT

- LCD touch pad display
- Intuitive icons clearly indicate the current operating mode
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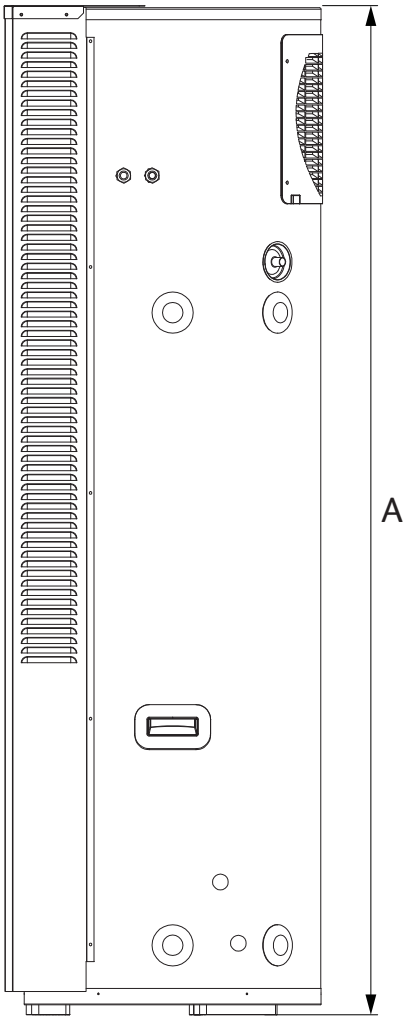
- Safety lock
- Individual back lit buttons for mode selection

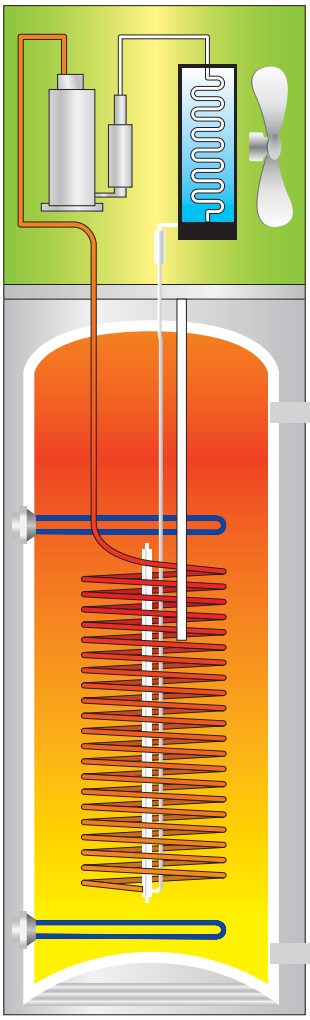
LCD remote

TECHNICAL SPECIFICATIONS - HPI

MODEL	HPI-40D1.0BI	HPI-50D1.0BI
Rated volume [L]	150	180
Voltagene / Frequency [V/Hz]	220~ / 50	220~ / 50
Rated Input / Current [W/A]		
Efficiency Mode	460 / 2.5	460 / 2.5
Hybrid Turbo Mode	2500 / 11.5	2500 / 11.5
Output(W)		
Efficiency Mode	1750	1750
Hybrid Turbo Mode	3750	3750
Water temperature range [°C]	35~75	35~75
Ambient temperature range for Efficiency [°C]	7~43	7~43
Tank rated pressure (bar)	10	10
Dimension A [mm]	1610	1800
Diameter of Tank	Ø520	Ø520
Weight of Tank (kg)	89	98

EXTERNAL DIMENSIONS





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Green Power & Company
Total Water Solutation

HPA

Air to Water Heat Pump

Storage Capacity - 300 litres

THE HIGH EFFICIENCY REVOLUTION IS HERE!

HPA

The HPA heat pump water heater is a split type system that utilises the heat pump technology to provide efficient way to heat water with electricity. HPA pulls heat from surrounding air and deposits the heat into the tank. The end result is hot water with cooler and dehumidified air as a welcome by-product.

PRODUCT FEATURES:

Energy Saving Heating:
The New generation water heater extracting heat from the atmosphere and using it for heating water.

Max:
MAX function for more hot water output, therefore better bathing experience.

AES (adaptive energy-saving system):
AES feature adopts heating cycle automatically, which will facilitate water usage and save energy by minimizing thermal loss.

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Indicates the amount of hot water available in the tank.

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Wired remote controller:
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Glass-lined special protective tank:
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Anode rod protection:
A powerful steel-core-anode rod to protect tank and prolonged service life of the heat pump water heater.

High efficiency Energy Saving Insulation:
A polyureathane foam insulating layer reduces heat loss effectively.

ALL ROUND SAFETY

- Triple protection - Thermostat, High temperature limit and T&P relief valve.
- Refrigerant and water are completely separated, condenser uses rectangular steel tubes.
- Water can be heated upto 65°C on heat pump mode, which prevents breeding of Legionella bacteria.
- Compressor overheating protection
- High and low voltage protection
- Refrigerant leakage protection

SMART & CONVENIENT

- LCD touch pad display
- Intuitive icons clearly indicate the current operating mode
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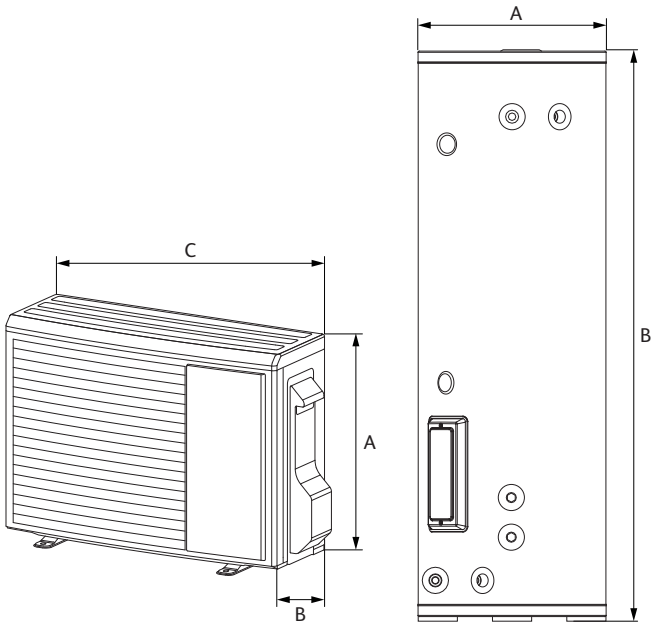
- Safety lock
- Individual back lit buttons for mode selection

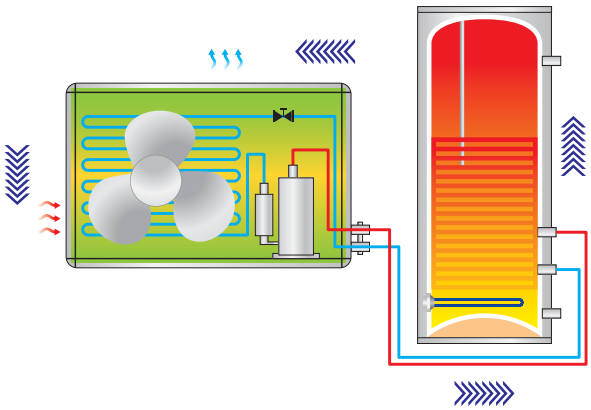
LCD remote

TECHNICAL SPECIFICATIONS - HPA

MODEL		HPA-80C1.5A
Rated volume [L]		300
Voltagene / Frequency [V/Hz]		220~ / 50
Rated Input / Current [W/A]		
Efficiency Mode		1010/4.6
Hybrid Turbo Mode		2010/9.1
Output(W)		
Efficiency Mode		3640
Hybrid Turbo Mode		4640
Water temperature range [˚C]		35~75
Ambient temperature range for Efficiency [˚C]		-7~43
Tank rated pressure (bar)		10
External unit dimension	A [mm]	560
	B [mm]	320
	C [mm]	835
Tank dimension	A [mm]	Ø610
	B [mm]	1640
Weight of external unit (kg)		37
Weight of tank (kg)		98

EXTERNAL DIMENSIONS





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CAHP-5HP & 10HP

AIR-TO-WATER Heat Pump

THE HIGH EFFICIENCY REVOLUTION IS HERE!

CAHP 5HP & 10 HP

COMMERCIAL HEAT PUMP WATER HEATER FROM A. O. SMITH

Our impressive line of environmentally friendly offerings has now been expanded to include one of the most energy-efficient and innovative commercial products on the market.

The electric commercial heat pump water heater works great in applications where the need is for hot water. Applications requiring significant hot water usage will maximize energy savings for the shortest payback periods. Best of all, heat pump heaters are three times more efficient than standard electric water heaters and up to four times more efficient than conventional gas water heaters.

COMMON APPLICATIONS

Commercial	:	Restaurant/Kitchens
Institutional	:	Hospitals, Hotels, Schools, Hostels, Resorts
Residential	:	Villas, Apparments, Guest houses
Industrial	:	Factories, Laundries

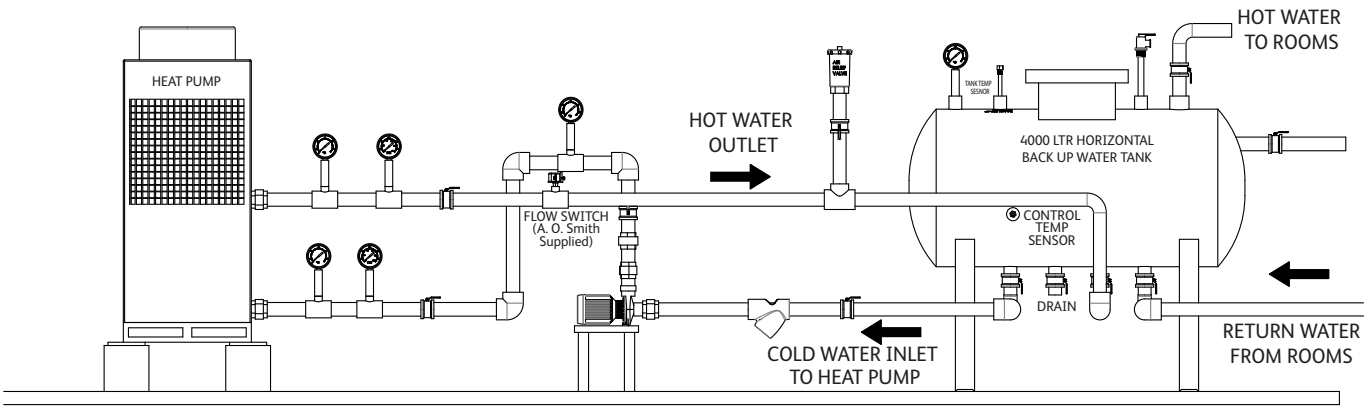
WHY ARE HEAT PUMP WATER HEATERS AN ENVIRONMENTALLY FRIENDLY CHOICE?

- Hiqh efficiency with coefficient of performance (COP) up to 4
- No fossil fuels are used or burned at the source
- Ozone layer-friendly refrigerant R410a
- Uses less electricity than standard electric water heaters
- Contributes to space cooling at the same time
- Taps into heat sources typically discarded by other units for peak efficiency

HOW DO HEAT PUMP WATER HEATERS WORK?

Heat pump water heaters capture heat and humidity from the surrounding atmosphere through the cooling coil and utilize it for heating potable water. Simply put, they move heat from where it is not needed to where it is wanted. This innovative advanced technology provides low cost hot water and free cooling (by product).

SCHEMATIC DRAWING

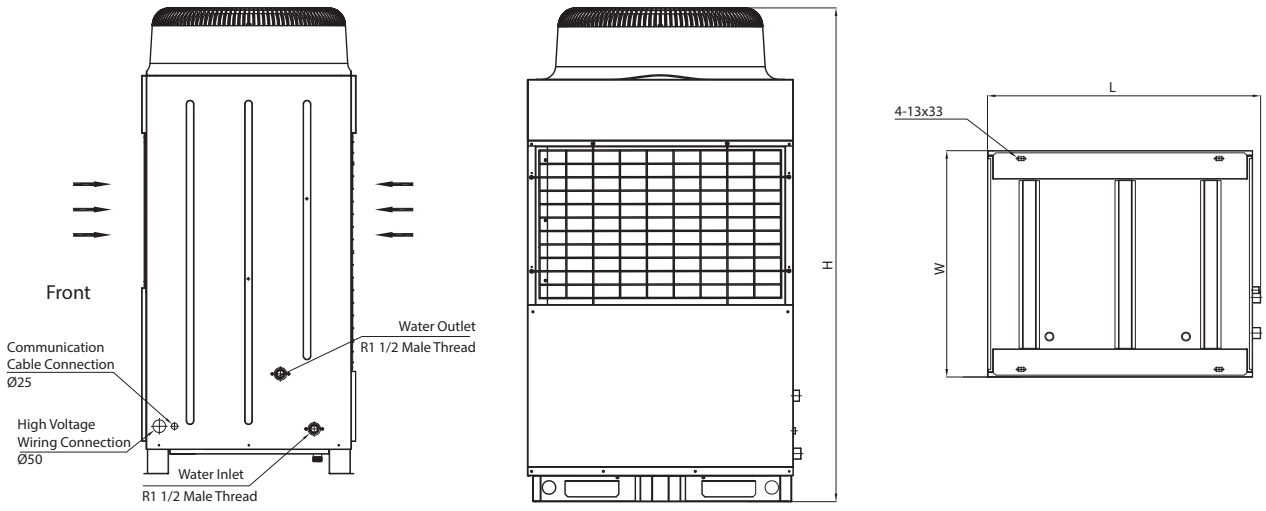


CAHP 5HP & 10 HP

Technical Specifications		
ITEM	CAHP-MC-38 (10HP)	CAHP-MC-19 (5HP)
POWER SUPPLY	380V 3N ~ 50Hz	380V 3N ~ 50Hz
VOLTAGE RANGE	380V +/- 10%	380V +/- 10%
RATED HEATING CAPACITY(1)	38 kW	19.8 kW
RATED WATER FLOW(1)	6.5 CMH	3.4 CMH
RATED POWER INPUT (1)	10.3 kW	6.02 kW
RATED OPERATION CURRENT(1)	18.6 A	11.0A
MAX. POWER INPUT	13.2 kW	6.8 kW
MAX. OPERATION CURRENT	23.3 A	11.7 A
OPERATION NOISE (2)	65 dB(A)	60 dB(A)
REFRIGERANT / QUANTITY	R410a / 6.2kg	R410a / 2.8kg
REFRIGERANT SIDE HIGH SIDE	4.2 Mpa	4.4 Mpa
DESIGN PRESSURE LOW SIDE	3.1 Mpa	3.1 Mpa
WATER SIDE DESIGN PRESSURE	1.0 Mpa	1.0 Mpa
WATER SIDE PRESSURE DROP (3)	45 kPa	73 kPa
WATER CONNECTION SIZE	DN40 (R1 1/2")	DN32 (R1 1/4")
WATERPROOF CLASS	IPX4	IPX4
NET WEIGHT	287 kg	170 kg
DIMENSIONS (L x W x H)	1020 x 846 x 1840 mm	719 x 761 x 1160 mm

Note:
(1) Rated condition: Ambient temperature 20/15 °C (dry/wet bulb), water temperature 47/52 °C (inlet/outlet).
(2) Sound at one meter distance.
(3) Measured at the rated water flow

Physical Dimensions



Storage tank: Minimum 2000 & 4000 litre for 5HP & 10HP respectively
Circulation pump flow rate: 3500 LPH & 6500 LPH for 5HP & 10HP respectively
Recommended water hardness: Less than 300 ppm

Electrical Water Heaters

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Innovation has a name.

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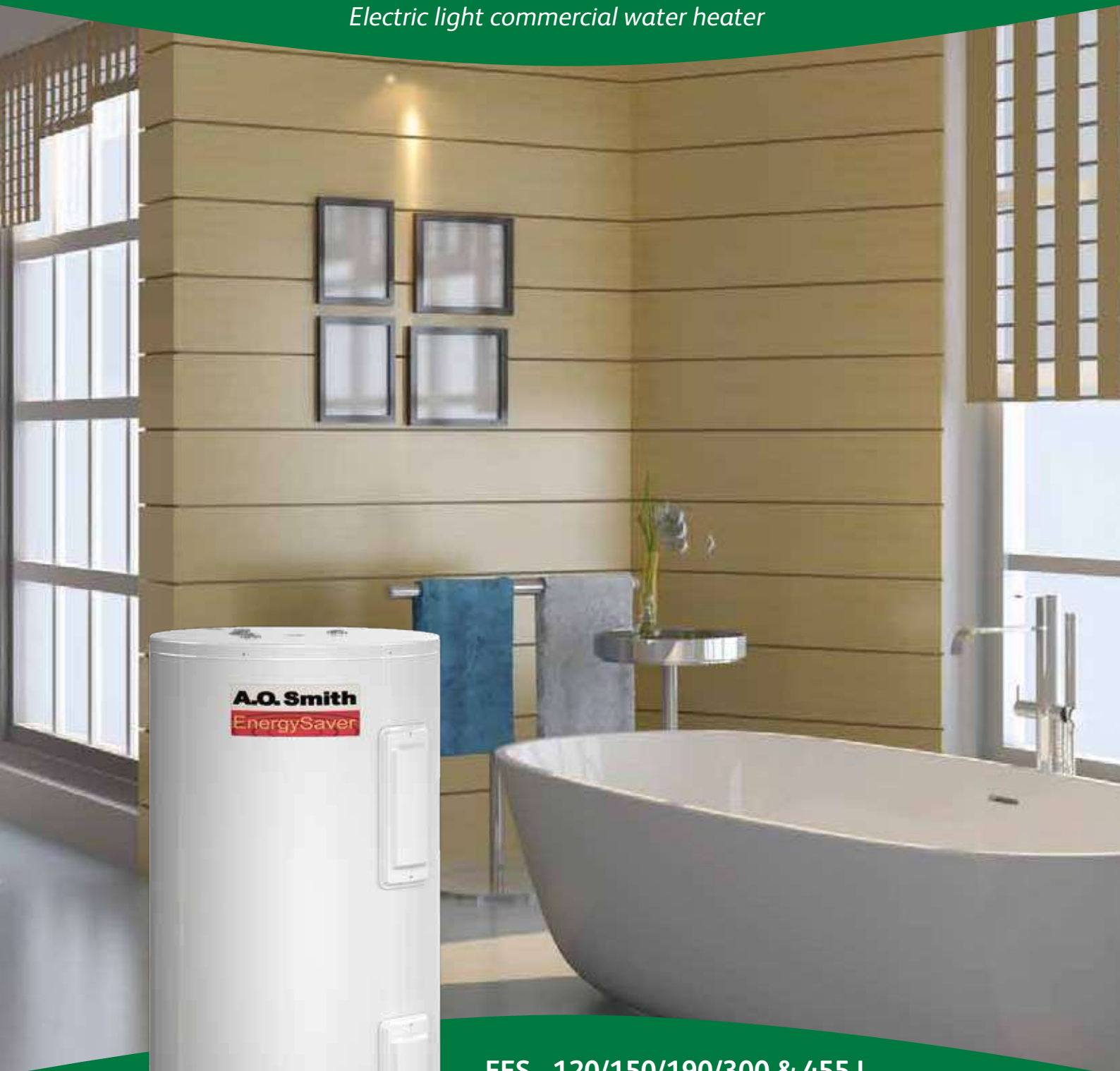
Electric light commercial water heater



EES - 120/150/190/300 & 455 L

WHY PEOPLE PREFER AN
A. O. SMITH WATER HEATER...

- ADVANCED TECHNOLOGY
- SUPERIOR QUALITY
- ENERGY SAVING
- MADE BETTER

EES

Electric light commercial water heater

KEY FEATURES

BLUE DIAMOND® GLASS LINING
Blue Diamond® Glass Lined Tank. Maximum protection against hard water and corrosion.

GLASS COATED HEATING ELEMENT
Helps to prevent scale formation and extends the life of the heating element.

TEMPERATURE CONTROL KNOB
Allows you to set the temperature anywhere between 25˚C to 75˚C.

THERMAL CUTOUT
If the water temperature exceeds the preset level, the thermal cut-out cuts off the power supply to assure safety.

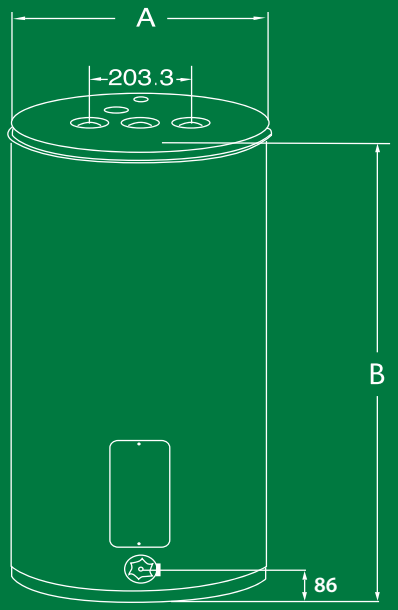
SAFETY VALVE
The safety valve is designed to automatically relieve pressure and discharge water in case the pressure overshoots the preset limits.

INSULATION FOAM 50mm,
50mm boonryeok excellent heat dissipation effect of preventing the other products with polyurethane insulation the more excellent.

STRESS TEST
A. O. Smith to ensure the best quality self-testing 21kgf / cm2.

SPECIFICATIONS

MODEL		EES 30	EES 40	EES 50	EES 80	EES 120
Volume [L]		120	150	190	300	455
Power [W]		6000				
Voltage/Frequency [V/Hz]		220V/50Hz				
Rated water pressure [Bar]		8				
Form of water inlet & outlet		Top inlet / Top outlet				
Dimensions	A [mm]	530	530	520	620	720
	B [mm]	940	1115	1395	1470	1635
Net Weight [kg]		43	53	60	94	153



Oil Fired Water Heaters

Green Power & Company
Total Water Solutation

A.O. Smith
Innovation has a name.

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Green Power & Company
Total Water Solutation

COF

Commercial Oil-Fired Water Heaters

THE HIGH EFFICIENCY REVOLUTION IS HERE!

COF

FEATURES

Meets Ashrae/ies 90.1b-1992 Requirements For ImprovedEnergy Efficiencies.

LIME TAMER™ MODELS INHIBIT	Lime Tamer™ models are warranted against tank failure due to sediment buildup for three years.
LIME AND SEDIMENT BUILDUP	
GLASS-LINED TANK	Assures years of rust-free clean hot water. 11 Bar working pressure.
82°C ADJUSTABLE	Has upper and lower sensing bulbs to average water temperatures at top and bottom of heater for
THERMOSTAT	maximum temperature control (49°C-82°C).
SAFETY SHUTOFF	Limits temperature buildup.
UL LISTED OIL BURNER	Precision engineered to match the units they are used with; designed to fire 7 to 19 Liters of oil per hour. All models equipped with single phase continuous duty motor 120 volt AC 50 Hz, 3450 rpm with manual overload switch and interrupted ignition. Standard burners equipped with single stage pump with 1 or 2 line capability. Flame retention principle assures high rate of combustion efficiency, yet maintains low operating noise levels. Fuel unit includes pump, strainer, pressure regulating valve and ignition transformer. Transformer rated at 120 volt AC, 50 Hz with 10,000 volt secondary, UL listed for use commercial grade Diesel oil. Burner mounted cadmium cell relay for flame detection - 15 second safety switch timing eliminates the need for RA890F Electronic Safeguard. Complies with UL A708.5-32/33.
EFFICIENT COMBUSTION CHAMBER	Precast, high temperature combustion chamber made of alumina silica ceramic fiber. Engineered for maximum insulation and heat reflection. Unique design assures more complete combustion by stabilizing flame pattern.
INTERRUPTED IGNITION	Reduces electrical consumption.
OIL SOLENOID SAFETY VALVE	Standard on COF-455 and 700.
20mm DRAIN VALVE	Provided in lower tank for fast draining.
TWO HAND-HOLE CLEANOUTS	Allows easy cleaning on standard models COF-385 and larger and ASME models.
ANODIC PROTECTION	For longer tank life.
FLAME OBSERVATION PORT	Permits convenient flame check.
FOAM INSULATION	Saves fuel, helps assure constant temperature, verminproof.
JACKET	Heavy gauge steel with baked enamel finish over bonderized undercoat. Not approved for installation on combustible flooring.
EASY TO INSTALL BURNER	Three bolt mounting of burner assures easy installation.
BAROMETRIC DRAFT FACTORY	
INSTALLED AGA RATED T&P VALVE	
OPTIONAL	
Two Stage Pump	For use with underground oil storage tanks.
Oil Solenoid Safety Valve	Optional on COF-199, 245, 315 and 385.
ASME Construction Available	On models COF-315A, ASME units have 11 Bar working pressure.
CAUTION	Units must be installed on noncombustible surface.

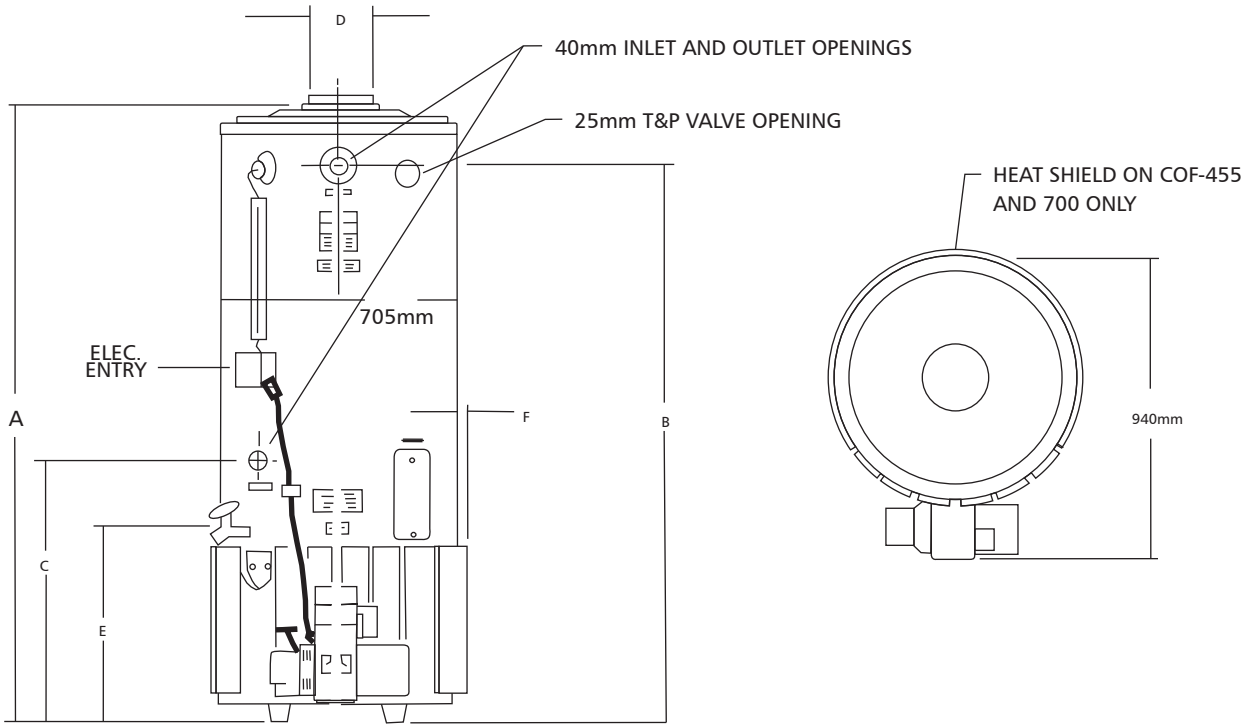
Lime Tamer™

ASME (OPTIONAL)

c UL® US

COF

TECHNICAL SPECIFICATIONS - COF



Model	A mm	B mm	C mm	D mm	E mm	F mm
COF-199	1,899	1,721	686	152	584	—
COF-245	1,899	1,721	686	203	584	—
COF-315	1,899	1,721	686	203	584	—
COF-385	1,899	1,651	641	203	603	—
COF-455	1,899	1,676	641	203	603	19
COF-700	2,026	1,778	762	254	737	19

Specifications and Recovery Capacities in LPH

Models	Firing Rate LPH	Tank Storage (Liters)	Output* Kcal/Hr	RECOVERY RATES AT °C RISE								Motor HP	Approx. Ship. Wt. (Kgs)	
				22°C	33°C	45°C	50°C	56°C	61°C	72°C	78°C		Standard	ASME
COF-199	**4.6**	**326**	**40,121**	**1827**	**1220**	**913**	**811**	**731**	**663**	**561**	**523**	**1/8**	**256**	**—**
COF-245	**5.6**	**326**	**49,395**	**2251**	**1501**	**1126**	**1001**	**902**	**819**	**694**	**644**	**1/8**	**251**	**—**
COF-315	7.3	318	63,508	2896	1929	1448	1285	1156	1054	891	826	1/8	251	301
COF-385	8.9	284	77,621	3536	2357	1770	1573	1414	1285	1088	1012	1/8	287	329
COF-455	10.5	284	91,734	4180	2786	2092	1857	1671	1520	1285	1194	1/8	291	337
COF-700	16.2	262	141,129	6432	4286	3214	2858	2573	2338	1978	1838	1/8	333	384

Recovery ratings are based on 85% thermal efficiency on GCV of HSD (10,800 Kcal per kg)

NOTE: Above 610m altitude, input ratings should be reduced 4% for each 305m above sea level.

Technical Data

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VARIOUS FORMULAS FOR WATER HEATING CALCULATIONS

% Efficiency = $\frac{\text{GPH x 8.25 x Temp. Rise x 1.0}}{\text{Btu/Hr. Input}}$

Btu/Output = GPH X 8.25 Lbs./Gal. X Temp. Rise X 1.0

BtulInput = $\frac{\text{GPH X 8.25 X Temp. Rise X 1.0}}{\text{\% Efficiency}}$

Gal/Per/Hr. = $\frac{\text{Btu/Hr. Input X \% Efficiency}}{\text{Temp. Rise X 8.25}}$

Rise(°F) = $\frac{\text{Btu/Hr. Input X \% Efficiency}}{\text{GPH X 8.25}}$

KW = $\frac{\text{GPH x 8.25 x Temp. Rise x 1.0}}{3413}$ (OR) $\frac{\text{GPH x Temp. Rise}}{414}$

Gal/Per/H r. = $\frac{\text{KW x 3413}}{\text{Temp. Rise x 8.25}}$

Rise(°F) = $\frac{\text{KW x 3413}}{\text{GPH x 8.25}}$

1 KW = 3413 Btu = 4.1 Gals. @ 100°F Rise
1KW = 1,000 Watts Btu x 0.293 = Watts

Determine % of hot water portion of total mixed water requirements

M-C / H-C = $\frac{140-40}{180-40} = \frac{100}{140}$ = 71.5% of mixture is hot water

% of cold water in mixture is

M-C / H-C = $\frac{180-140}{180-40} = \frac{40}{140}$ = 28.5% of mixture is cold water

1Ø
Watts / Volts = Amps
Volts X Amps = Watts

3 Ø (Balanced Circuits)
.577 X Watts = Amps
Volts
Volts X Amps X 1.73 = Watts

PERCENTAGE OF 180°F PREHEATED WATER TO MIXING VALVE FOR SELECTED MIXED WATER TEMPERATURES

Desired Mixed Temperature % of 180°F Water For Each Cold Supply Temperature							
OF	40°	50°	60°	70°	80°	90°	100°
180	-	-	-	-	-	-	-
170	92.8	92.3	91.7	90.9	90	88.8	87.5
160	86	85	83.3	82	80	78	75
150	78.5	76	75	73	70	67	68.5
140	71	69	67	64	60	55.5	50
130	65	61.5	58	54.5	50	44	37.5
120	57	54	50	45	40	33	25
110	50	46	41.5	36	30	21	12
100	43	38	33	27	20	11	-

Example:
1) Desired mixed outlet water temperature = 140°F 71% of hot water @ 180°F
2)Hot water supply (stored water temp) = 180°F 29% of cold water @ 40°F
3)Cold water supply = 40°F 100% mixed water @ 140°F

Case Studies

Green Power & Company
Total Water Solutation

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Clean Room Application

(Biopharmaceutical Company)

An Indian biopharmaceutical company based in Bangalore manufactures generic active pharmaceutical ingredients uses A.O. Smith heat pumps for its clean room application

A clean room is an environment, typically used in manufacturing of pharmaceutical products with a low level of environmental pollutants such as dust, airborne microbes, aerosol particles, and controlled humidity level. In this plant humidity level is controlled by circulating hot water at various temperatures through air handling units (AHU).

In Tower S14, hot water is circulated through AHU's with the help of a circulation pump. Total volume of water inside AHU pipeline system is 40000 litres. Temperature requirement at AHU's inlet is 50 degree centigrade and water leaves out of AHU's at 45 degree centigrade. 200kWh heater capacity is required to serve the purpose.

Similar size clean room application in Tower S9 of the plant has been carried out by a steam generator of 200kW equivalent capacity with an average operational cost of INR 17,500 per day. The maintenance requirement of the system is also high.

A.O Smith recommended 5 units heat pump model CAHP-MC-38 each of 40 kW heating capacity for this application. We have submitted calculations based on inputs from Tower S9, projecting the company a guaranteed savings of minimum 50% compared to the existing heating method.

Benefits of using heat pump

The operating cost has been reduced to INR 6000 per day since its installation in 2015 March with zero maintenance till date.

Process Improvement

(Brigade Woodrose Club, Bangalore)

The Woodrose Club, combines the graciousness of a classic club with contemporary design and décor. Based on an award-winning design, with a resort-like ambience, the club is set within a large, green residential enclave in South Bangalore. The Woodrose Club offers its members a host of superlative sports, health and business facilities; formal and informal restaurants; 30 guest rooms; landscaped gardens and much more.

With a rapidly failing water heater and an old, inefficient boiler, the club required major upgrades to its heating system. High efficiency heat pump from A.O Smith provided the remedy needed.

Woodrose club was running 2 units of diesel fired boiler of 50,000 kilocalorie capacities which were installed since the inception of the club. The daily hot water requirement of the clubs falls between 10,000 and 12,000 litres. We discovered that energy efficiency was top-of mind for the company along with lowering emissions.

A.O. Smith recommended 1 unit CAHP-MC-38 of 40 kW capacity for this application based on the savings calculation report. As per the report the initial payback period was projected to be 18 months with an annual savings of approx INR 3,00,000. Report also highlighted ways to prevent energy losses in hot water pipelines.

In the initial report analysis, AO Smith had anticipated having to run one of the older boilers alongside the new system during peak load demand, but that has not been the case.

Shutting down the older boilers significantly increased the system's efficiency. As a result the operating cost has been reduced to 53% with an annual savings of more than INR 4,00,000.

Freedom from Air Pollution & Low on Running Cost

(Hotel Marine Plaza, Mumbai)

Hotel Marine Plaza a Sarovar Premier five star hotel property, located at marine drive, Mumbai was struggling to keep the operational cost in control due to high occupancy rates. Being in the heart of the city, air pollution was another issue which the property owners had to address. Considering the limited utility space available, replacing the existing oil fired boiler was a big challenge.
As the set up was very old, they had to look for an alternative that can be fitted without any additional inch in the available space.

With the old set up the daily hot water requirement was in the range of 15,000 LDP to 17,000 LPD. The old diesel fired boiler with calorifier tank of 10,000 litres capacity was operating at very low efficiency of 65% consuming around 120 LPD diesel.
With the average rate of Rs. 65 per litre for diesel, monthly operating cost for boiler was more than Rs.2,35,000. Besides this they were facing other significant issues like weekly maintenance, manual intervention by dedicated trained operator, storage of diesel & pollution etc.

During the renovation work in the year 2014, based on the site conditions we recommended CAHP-MC-38 Heat Pump with the existing calorifier tank. Installation work was completed & heat pump system was commissioned in July 2014.

With new heat pump in place the operating cost dropped drastically without compromising on volume & temperature of hot water. After 6 to 8 months of satisfactory operation of heat pump, the old diesel boiler was scrapped .
The heat pump runs around 10-12 hours a day with average electricity consumption of around 10 units per hour resulting in total consumption of 3000 units per month. Considering electricity rate of Rs. 15.5 per unit operating cost of heat pump is less than Rs. 50,000 per month. Marine Plaza team is extremely happy with the performance of heat pump for last three years. They never faced any major maintenance issue with the system. With massive saving on operating cost in the range of more than Rs. 1,60,000 per month resulted in return on investment of less than a half year.

"Extremely satisfied with A.O.Smith Heat Pump. We would like to recommend it as an excellent product with very high energy efficient performance.We have got relief from manual intervention, maintenance & pollution related to diesel boiler. We are happy with installation expertise, service & support provided during the installation."

- Mr. Rajendra Mhatre, Chief Engineer, Hotel Marine Plaza

Capacity Flexibility

(Parijatha Gateway Hotel, Bangalore)

Parijatha Gateway, a truly luxurious heaven, be it for business or leisure is nestled amidst the tranquil area between Malleshwaram and Yeshwantpur in Bangalore and close to one of Asia's largest industrial estates Peenya. It offers spacious rooms and suites, a choice of restaurants and an amazing selection of cuisine from all over India.

Hotel had diesel fired boilers connected to a 2000 litre storage tank which acted as a centralised hot water system to its rooms and kitchen. Heating same amount of water during off season was a concern as hot water usage was less and resulted in increased heating cost. With a rapidly fluctuating hot water demand throughout the year the hotel required multiple storage tanks.

A.O. Smith recommended 3 units of heat pump model CAHP-120C-12 with inbuilt 450 litre glass lined tank, are connected in parallel giving the user a flexibility to use them together during high demand or to operate individually during lean loads. This resulted in optimum heating based on hotels actual requirement with huge savings in operating cost.

A Greenfield Residential Apartment Project

(Mokksh, Nasik)

Mokksh is a residential project comprising of 17 Super Premium Sky Villas by LNJ Authority located at College Road Nasik.

The project was designed for common solar water heating system & piping was done accordingly. The plan was to provide individual water heaters in each bathroom as a back up to solar.

Considering occupancy of five in each flat & 40 litres hot water consumption per head, total requirement was planned around 3500 litres. A solar system to generate 3500 LPD water required huge space occupying the major part of the terrace. With individual water heaters of around 25 lit. or 35 lit. per bathroom for sixty four bathrooms with heating element of 2 kW, total connected load of for hot water generation was going up by more than 120 kW.

As the common piping was done considering solar, we recommended our heat pump models CAHP-120C-12 to be connected to two tanks each of 2000 Lit capacity.

Benefits of using Heat Pump –

1. Connected load dropped to 30 kW on higher side with back up of 12 kW in each heat pump. Operating load dropped to 5 kW while the unit works on efficiency mode.
2. As the heat pump system needs very small footprint, terrace area is available for other usage.
3. Residents are satisfactorily using hot water round the clock with minimum operating cost.