

Copeland™ Heat Pump



Complete Hot Water Solutions for Commercial,
Residential and Swimming Pool Applications

Heat Pumps: The answer to all our hot water needs

Catering to a wide range of applications

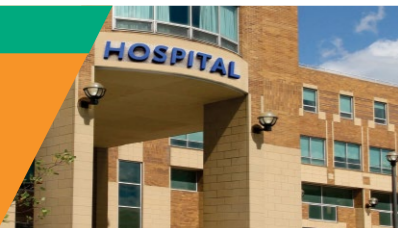
Hotel

- 20° to 60°C
- Sanitary
- Kitchen
- Laundry



Hospitals

- 60°C
- Steam Baths
- Laundry



Restaurants

- 20° to 60°C
- Utensil Washing



Apartments

- 30° to 60°C
- Kitchen
- Shower
- Laundry



Spas/Bungalows

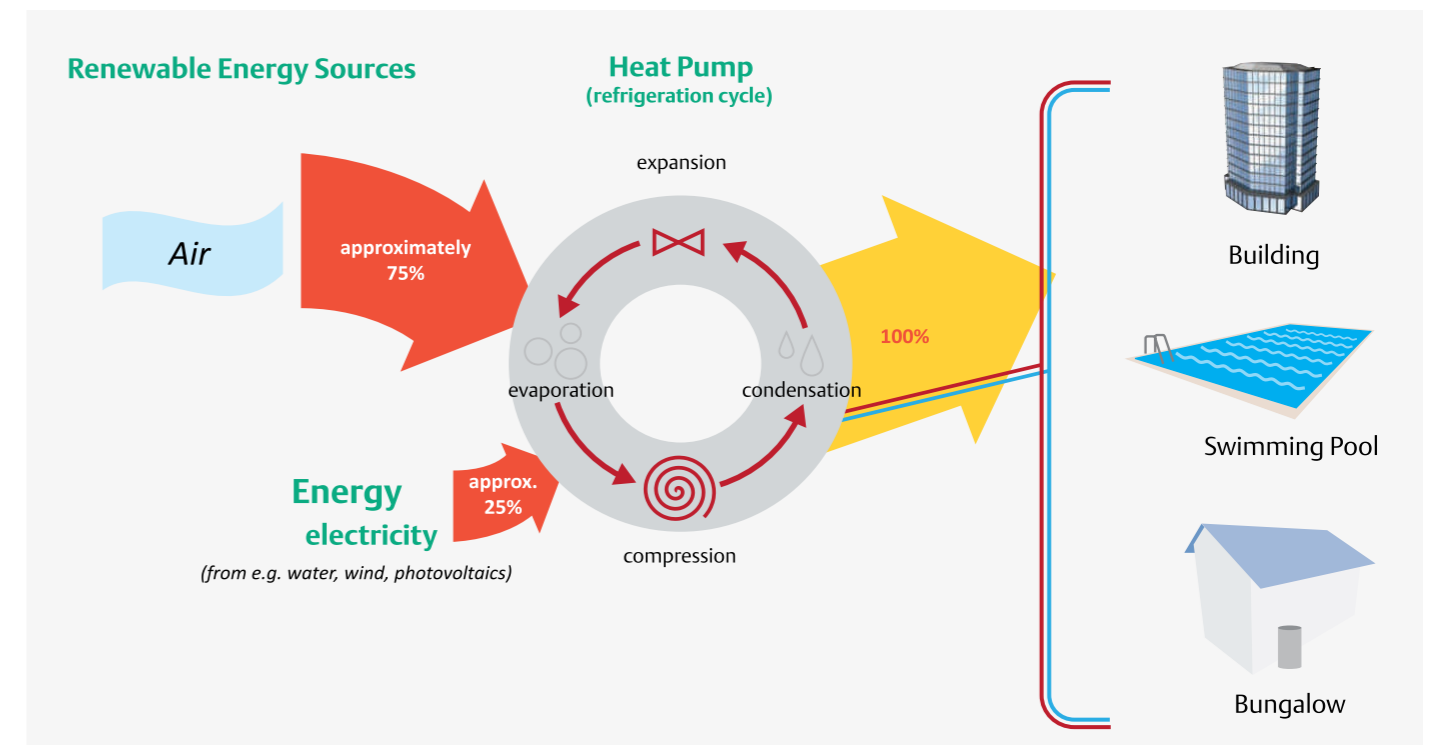
- 30° to 60°C
- Swimming Pool
- Steam Bath



In today's time of skyrocketing energy costs, Heat Pumps are what you need for all your hot water needs. Traditional methods of heating water, such as electric water heaters and burning of fossil fuels, are proving to be increasingly expensive and aren't ecofriendly too. So how cost effective are Heat Pumps for you? Heat Pumps save you up to 75% in energy costs and also drastically reduce environmental pollution. Just to give you an idea, the average heating cost, calculated in \$/kW is by far the best for a Heat Pump. While Electric heating costs you approximately \$0.12/kW, and LPG heating costs you \$0.09/kW, Heat Pump costs you a mere \$0.02/kW! Imagine the savings over an entire year.

Emerson has developed a range of commercial and residential Heat Pumps that utilize naturally available heat from air, ground and water. These are designed specifically for Indian conditions and deliver unmatched comfort and convenience. Emerson has also developed specialized Heat Pumps that are designed to heat swimming pool water to a precise temperature, so that you can enjoy swimming all year round, whatever the season. Whatever your requirement, Emerson Heat Pumps, with their reliability and versatility are the perfect choice.

Heat Pump Water Heating: Proven Green Technology



The Working of a Heat Pump

Copeland™ offers several advantages over conventional water heating systems. Besides being more reliable and efficient, these contribute to a more sustainable environment by utilizing renewable energy sources. Combining renewable sources and applying vapor compression technology results in substantial cost savings and a more environmentally sustainable means of heating water. Reduced usage of fossil fuels also contributes to cleaner air quality.



Copeland™ Heat Pump Series

World Class Heating Product Built On Proven Scroll & Reciprocating Platforms

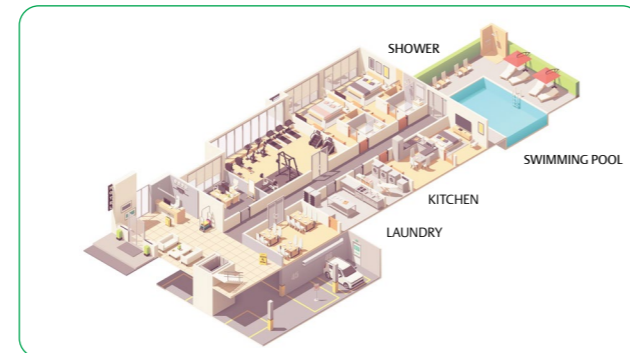
Copeland Heat Pump is a significantly more efficient solution for heating water. It utilizes naturally available heat from water, ground and even winter air and applies a vapor compression refrigerant cycle, consuming nearly one quarter of the electrical energy required for traditional water heating. At 75% reduced energy consumption, this contributes to cleaner air.

Copeland has developed a full range (from 100 Liters/Hr To 2,000 Liters/Hr) of water heating units; built on heating optimized Reciprocating and ZW scroll compressors to provide seasonal efficient heating capacity and effective domestic hot water production in residential, commercial and pool heating applications.

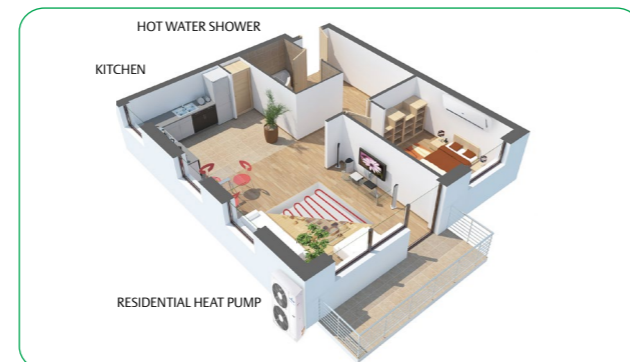
Copeland Heat Pumps are available for use with multiple refrigerants like R407C and R22 and are designed to deliver 60°C water temperature. They can operate from a wide ambient from 0°C to 43°C and fitted with Best-In-Class 'Shell & Tube' heat exchanger technology making them very easy to service and perfect for sites where the water quality is very poor. They also have a 'Simple User Interface'

which makes troubleshooting easy and allows service teams to get advance warnings about field failures, reducing downtime and increasing the life of the system. With all these benefits, the Copeland Heat Pump series is definitely the most reliable solution available on the market. Copeland also supports water heater contractors around the world by providing specifically designed units for heating water in the market.

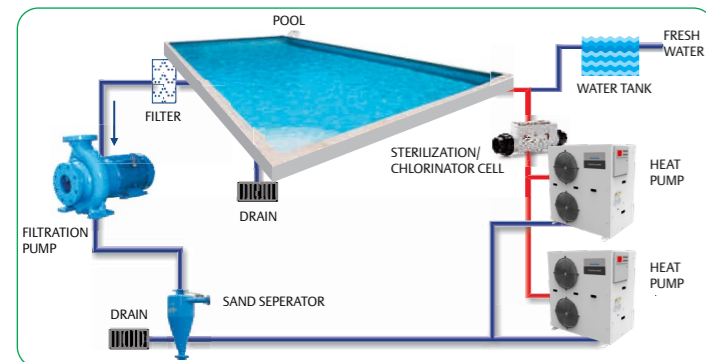
Heat Pump Water Heating-Commercial



Heat Pump Water Heating-Residential



Pool Heating System Diagram



Note: Drawing for demonstration only; Pipe layout is only for reference. For detailed installation diagram, please refer to the product manual.

- Significant energy savings; up to 75-85% Vis-a-Vis traditional heating systems
- Reliable hydrophilic evaporator design for coastal/salty conditions
- Corrosion proof -galvanized powder coated steel chassis with polyester coating
- Titanium tube in PVC shell condenser designed especially to handle chlorinated water in swimming pool heat pump
- Anti corrosion special coating on copper tubing
- Reliable and easy to maintain; designed for safe operation
- Environmentally friendly design; low GWP refrigerant options available
- 60°C hot water available 24/7; independent of weather conditions
- Automatic defrost module for low ambient operation
- Adjustable water temperature & accurate temperature control
- Legendary Copeland quality and reliability, customized for your requirement
- 100% factory tested, inspected at dedicated heat pump testing facility
- Emerson's diverse range of reciprocating and ZW scroll compressors developed to provide a reliable water heating solution

What Makes Copeland™ Heat Pump Series Unique?

Copeland ZW Scroll: Dedicated Scroll for Commercial and Pool Heating requirements



HOT WATER ASSURED



HOT WATER RELIABILITY



HIGH EFFICIENCY DESIGN



LOW LIFECYCLE COSTS



LOW AMBIENT PERFORMANCE



The Copeland scroll ZW compressor provides an energy efficient alternative for hot water heating and space heating - The perfect alternative to electric heaters or fuel-fired boilers. It is designed basis Copeland's strong experience of manufacturing over 150 million scroll compressors, that are recognized globally as reliable and efficient products. On this strong base, ZW applies Scroll Heating™ technology and multiple new product design features. ZW scrolls hold a new patent on the above features and technological advancements.

High Efficiency

Copeland scroll's efficiency is primarily derived from its axial compliance design. ZW scrolls are required to operate on a much wider range of envelope compared to standard heat pump air-conditioners. This has been accomplished by a new axial compliance pressure balance combination designed especially for ZW scrolls. It also applies a highly efficient, high power motor which can cater to extremes required by Heat Pump Water Heating (HPWH); to generate low internal losses at mild ambient cold tank heating and provide adequate power demanded at ambient tank reheating.

Copeland ZW Scroll Scores Over Traditional AC Scrolls

Innovation Criteria	Traditional Scroll AC	ZW Water Heating Scroll Design Innovations
Heating capacity	Standard	15-20% Higher than standard
COP	Standard	15-20% More than standard
Highest water temperature	55°C	60°C (Heating optimized valve designed for high compression ratios)
Hot water reliability	Standard	Stronger & robust scroll design, high power motor to operate at low ambient & higher condensing temperature vs ac compressors

Water heating Copeland scroll ZW compressors are designed to meet different winter ambient regions in India. For tropical regions and moderate winter ambient regions, the compressor is designed without vapor injection.

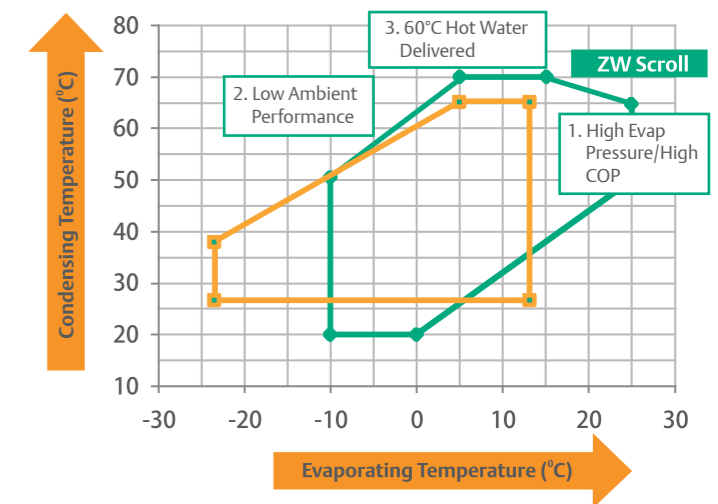
Hot Water Reliability

Water heating is characterized by long operating hours at both high load and high compression ratios. Demand for hot water is at its highest when ambients are low and when conventional heat pump capacity falls off. ZW**KA compressors are designed for reliable operation for heavier duty applications where the ambient temperature does not fall below 0°C; with significantly enhanced heating capacity, higher efficiency, and minimal requirement to reduce water outlet temperatures.

Environment Friendly Design

Low GWP refrigerants are utilized by the ZW compressor. Using ZW shows commitment in promoting green technology through the direct and indirect reduction of CO emissions.

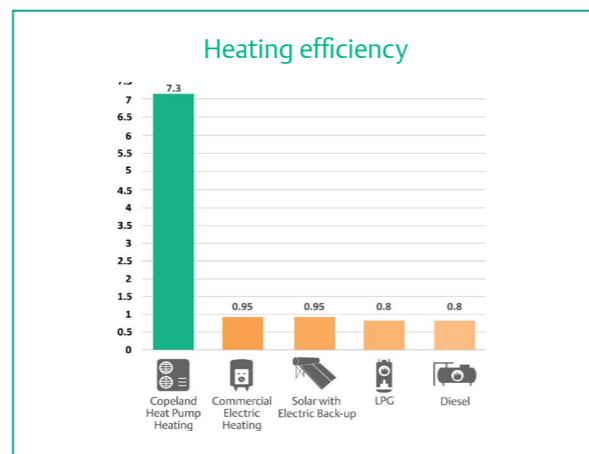
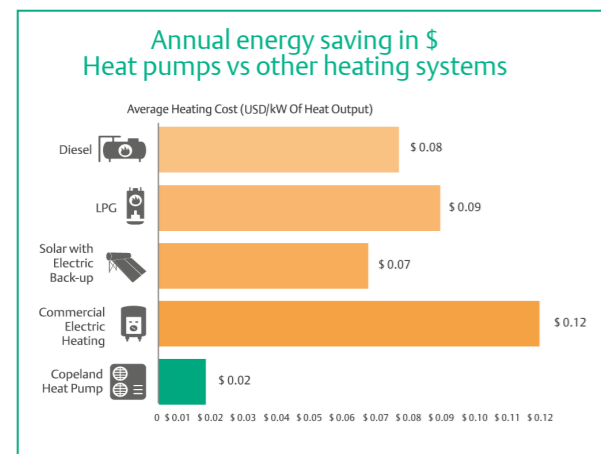
Copeland ZW Scroll Scores Over Traditional AC Scrolls



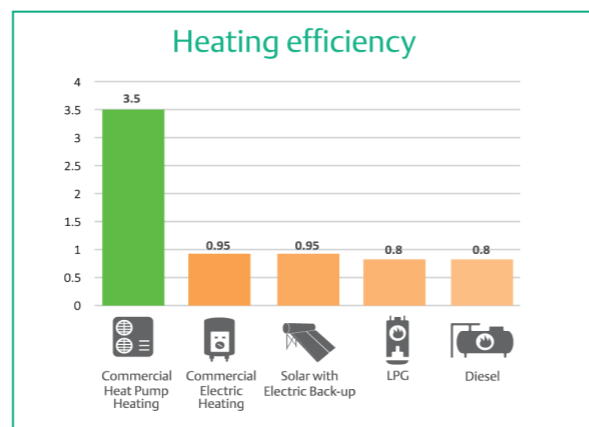
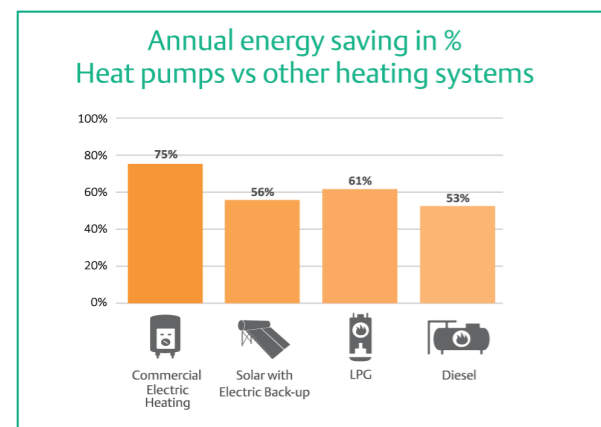
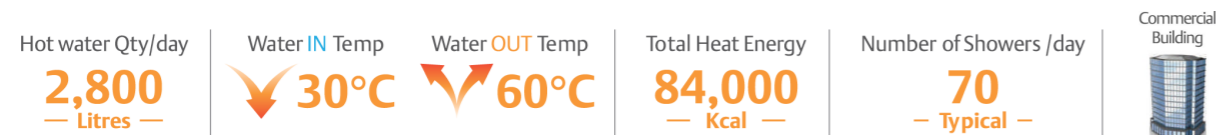
Copeland™ Heat Pump Offers Best ROI & Lower Operating Costs

Sustainable, Energy Efficient & A Reliable Alternative To Existing Heating Technologies

Delivering up to 75% energy savings vs traditional heating systems



Delivering up to 75% energy savings vs traditional heating systems



Copeland heat pumps comparison versus competing technologies

Heat pump technology scores across all parameters

Parameters	Copeland Heat Pump Heating	Electric Heating	60-75%	Diesel	LPG
Energy Savings w.r.t Conventional	Up to 75%	N/A	60-75%	N/A	N/A
Space Requirement	5% Of Solar	5% Of Solar	N/A	5% Of Solar	5% Of Solar
Climate Independent	Yes	N/A	No	N.A	N.A
Efficiency	Up to 400%	Up to 95%	Up to 95%	Up to 80%	Up to 80%
Maintenance	Minimal	High	Panel Cleaning	High	Moderate
Environment Friendly	Yes	Yes	Yes	No	No
Safety	Yes	Moderate	Yes	Moderate	No
Depreciation	40% in 1 Year	No	40% in 1 st Year	No	No

Copeland heat pumps: The need of the hour

The solution to common challenges in traditional heating methods

- Lack of space Costly real-estate
- Poor radiation days
- High fossil fuel usage
- Rising electric bills
- Safety/Fuel ducting & piping

Note: Results shown from above analysis are designed for comparative purposes only. The assumptions and data used for the analysis may change depending on the market conditions. Emerson cannot be held responsible for any errors, omissions, or misrepresentations in the data represented. If you need confirmation on the detailed analysis, please get in touch with your Emerson Representative.

Easy to Maintain & Service

Poor Water Quality Leads To Scaling Issues & Abnormal Operating Conditions

Many times water quality can cause serious problems in hot water systems. The water should be tested for hardness, acidity and iron content before a heat pump is installed. Your contractor or equipment manufacturer can tell you what level of water is acceptable. Mineral deposits can build up inside the heat pump's heat exchanger.

Some possible issues that may occur include:

- Scale formation
- Pressure drops
- Efficiency loss
- High discharge pressure and can lead to system failure

Our Solution: Shell & Tube Condenser For Handling Poor Quality Of Water

Our units come fitted with best-in-class 'Shell & Tube' heat exchanger technology. These are easier to service compared to other available Heat exchangers like Tube-In-tube, Plate Type heat exchangers etc. Shell & Tube heat exchangers are the perfect solution for the Indian market where the water quality is very poor at site. All condenser models are simple to install and can be easily opened for inspection, cleaning and maintenance purposes.



Characteristics	Shell & Tube	Tube In Tube	Plate Type
Heat Transfer Efficiency	Comparable	Moderate	Moderate
Ability To Handle High Operating Pressures & Temperature	✓	Moderate	Limitation due to bonding material
Leakage Concerns	Easy to locate leaks	Difficult	Difficult to locate leaks
Corrosion	Moderate	Moderate	More prone (titanium)
Ability To Handle Impure Water/ Scaling	Can handle any water quality	Needs treated water	Needs treated water
Maintenance	Easier to clean/ Maintain using brush	Difficult	Difficult



Individual Components Easily Accessible In Field Designed For Easy Maintenance In Field



Service Panels Removable For Access

Multiple Compartment Design For Easy Access To Pump, Compressor & Components

Shell & Tube HX Slides Out After Disconnecting Valves

Simple to Use & Control

Complete Diagnostic Capability & Full Electrical Protection

Simple to Use Diagnostics Features

The Copeland Heat Pump series is designed for simple & easy operation in the field for end-users like apartments, bungalows, hotels, hostels, restaurants, swimming pools, etc. These units come with 'Simple User Interface' which allows service teams to get advance warnings about field failures, simple error codes for easy diagnosis & troubleshooting. This reduces the downtime and increases the life of the system.



Simple to use & control
LED display for
parametric control
& fault analysis



Schedule your
heat pump daily



Complete electrical
protection



100% Component
protection
with diagnostics
& running status



Computer
connectivity
through rs485



Weatherproof
enclosure



Automatic defrost
module for low
ambient operation

Diagnostic Features For Easy Troubleshooting



- Amp /Voltage monitor key**
View electrical data of heat pump
- Tank temp & parameter set key**
Control tank temperature & other Parameter
- Backward / Log key**
View alarms/faults during operation
- UP / Probe for temp monitoring key**
Increase pre-set temperature: scroll other parameters
- DOWN / Programming Key**
Decrease pre-set temperature; scroll Other parameters
- Forward / Real time clock key**
Set real time clock, date, time etc.
- Reset key**
Exit any mode
- Power on/off key**
Switch on/off the heat Pump & controller
- Power LED**
Visual indication of power
- Alarm signal LED**
Visual indication of alarms/faults

System Protector/End User

- No incoming water flow
- High discharge pressure cut off (manual reset only)
- Low pressure cut off
- Water tank temperature
- Any part / sensor failure
- Fuse failure display
- Controller communication error
- Daily usage programming capability
- Communication port - to connect to laptop (RS485)
- Installer password lock
- Master password lock
- Memory for last 30 errors occurred

Component Protection

Compressor

- Single phase, phase missing/reversal
- Under/over voltage & current
- High discharge temperature

Water Pump

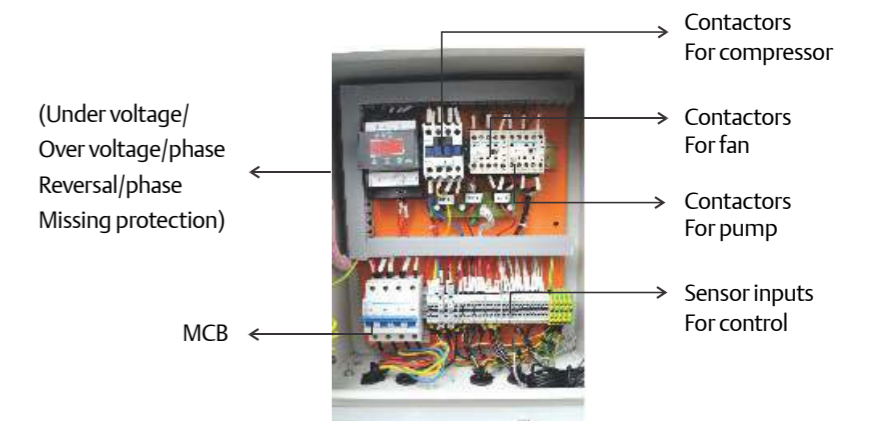
- Dry run protection
- High current protection

Fan Motors

- Healthy status
- High current
- One fan fails

Complete Electrical Protection For Field Issues

- Under/ low voltage protection
- Single phasing/ phase missing & reversal protection
- Compressor overload protector
- Pump overload protector
- Mcb/fuse as standard
- Auto defrost feature for low ambient weather



Copeland™ Residential Heat Pump

Technical Specifications - Standard Models

Model Name		EHP-R010X-PBA-XXX	EHP-R015X-PGA-XXX	EHP-R020X-PGA-XXX
Nominal Capacity	HP	1	1.5	2
Hot Water Capacity	LPH	100	150	200
Heat Pump	Power Supply	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph
	Ambient Range	°C	10 to 40	10 to 43
	Max. Water Temperature	°C	55	55
	Capacity	kW	3.5	5.2
	Input Power	kW	1.2	1.6
	COP		3	3.3
	Current	A	7.7	9
	Refrigerant Gas		R407c	R134a
Compressor	Type	-	Reciprocating	Reciprocating
	Current	A	6	7.5
Fan Motor	Quantity	pcs	1	1
	Supply	A	0.7	0.7
Water Pump	Head	Feet	8	10
	Rating Current	A	0.36	0.36
Heat Exchanger	Type/Model	-	Tube in Tube	Tube in Tube
Water Piping	Inlet Pipe Size	Inch	1" BSP	1" BSP
	Outlet Pipe Size	Inch	1" BSP	1" BSP
Dimensions	Dimension (DxWxH)	mm	355 x 905 x 625	355 x 905 x 625
	Approx. Weight	Kgs	72	82

Rating Condition - At Ambient of 25°C & Inlet Water of 25°C; Final Water Temperature of 55°C

Technical Specifications - Low Ambient Models - with Auto Defrost

Model Name		EHP-R010X-PBB-XXX	EHP-R015X-PGB-XXX	EHP-R020X-PGB-XXX
Nominal Capacity	HP	1	1.5	2
Hot Water Capacity	LPH	100	150	200
Heat Pump	Power Supply	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph
	Ambient Range	°C	0 to 40	0 to 43
	Max. Water Temperature	°C	55	55
	Capacity	kW	3.5	5.2
	Input Power	kW	1.2	1.6
	COP		3	3.3
	Current	A	7.7	9
	Refrigerant Gas		R407c	R134a
Compressor	Type	-	Reciprocating	Reciprocating
	Current	A	6	7.5
Fan Motor	Quantity	pcs	1	1
	Supply	A	0.7	0.7
Water Pump	Head	Feet	8	10
	Rating Current	A	0.36	0.36
Heat Exchanger	Type/Model	-	Tube in Tube	Tube in Tube
Water Piping	Inlet Pipe Size	Inch	1" BSP	1" BSP
	Outlet Pipe Size	Inch	1" BSP	1" BSP
Dimensions	Dimension (DxWxH)	mm	355 x 905 x 625	355 x 905 x 625
	Approx. Weight	Kgs	72	84

Rating Condition - At Ambient of 25°C & Inlet Water of 25°C; Final Water Temperature of 55°C

Copeland™ Commercial Heat Pump

Technical Specifications - Standard Models

Model Name		EHP-Z030X-TEA/TBA-XXX	EHP-Z050X-TEA/TBA-XXX	EHP-Z100X-TEA/TBA-XXX
Nominal Capacity	HP	3	5	10
Hot Water Capacity	LPH	300	500	1000
Heat Pump	Power Supply	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph
	Ambient Range	°C	10 to 43	10 to 43
	Max. Water Temperature	°C	60	60
	Capacity	kW	11	17.4
	Input Power	kW	3.3	4.8
	COP		3.3	3.7
	Current	A	5.6	9.7
	Refrigerant Gas		R22/R407C	R22/R407C
Compressor	Type	-	ZW Scroll	ZW Scroll
	Quantity	pcs	1	2
Fan Motor	Power Supply		230V/1Ph	230V/1Ph
	Power Supply		230V/1Ph	230V/1Ph
Water Pump	Power Supply		230V/1Ph	230V/1Ph
Heat Exchanger	Type	-	Shell & Tube	Shell & Tube
Water Piping	Inlet Pipe Size	Inch	1" BSP	1" BSP
	Outlet Pipe Size	Inch	1" BSP	1" BSP
	Min. Water Flow (Recommended)	LPH	1400	2800
Dimensions	Dimension (DxWxH)	mm	505 x 1145 x 810	710 x 1235 x 1060
	Approx. Weight	kg	190	230

Rating Condition - At Ambient of 25°C & Inlet Water of 20°C; Final Water Temperature Of 55°C

Technical Specifications - Low Ambient Models

Model Name		EHP-Z030X-TEB/TBB-XXX	EHP-Z050X-TEB/TBB-XXX	EHP-Z075X-TEB/TBB-XXX	EHP-Z100X-TEB/TBB-XXX	EHP-Z200X-TBB-XXX
Nominal Capacity	HP	3	5	7.5	10	20
Hot Water Capacity	LPH	300	500	750	1000	2000
Heat Pump	Power Supply	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph
	Operating Ambient Range	°C	0 to 43	0 to 43	0 to 43	0 to 43
	Max. Water Temperature	°C	60	60	60	60
	Capacity	kW	11	17.4	26.1	36
	Input Power	kW	3.3	4.8	7.6	9.4
	COP		3.3	3.7	3.4	3.8
	Current	A	5.6	9.7	16.1	21.5
	Refrigerant Gas		R22/R407C	R22/R407C	R22/R407C	R22/R407C
Compressor	Type	-	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll
	Quantity	pcs	1	1	2	2
Fan Motor	Power Supply	A	230V/1Ph	230V/1Ph	230V/1Ph	230V/1Ph
	Power Supply	Feet	230V/1Ph	230V/1Ph	230V/1Ph	230V/1Ph
Water Pump	Power Supply		230V/1Ph	230V/1Ph	230V/1Ph	-
Heat Exchanger	Type/Model	-	Shell & Tube	Shell & Tube	Shell & Tube	Shell & Tube
Water Piping	Inlet Pipe Size	Inch	1" BSP	1" BSP	1 ¼" BSP	1 ¼" BSP
	Outlet Pipe Size	Inch	1" BSP	1" BSP	1" BSP	1 ¼" BSP
	Water Flow (Recommended)		1400	2800	4800	5000
Dimensions	Dimension (DxWxH)	mm	505 x 1145 x 810	710 x 1235 x 1060	710 x 1270 x 1380	1092 x 1870 x 1946
	Approx. Weight	kg	192	235	350	404

Rating Condition - At Ambient of 25°C & Inlet Water of 20°C; Final Water Temperature Of 55°C

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