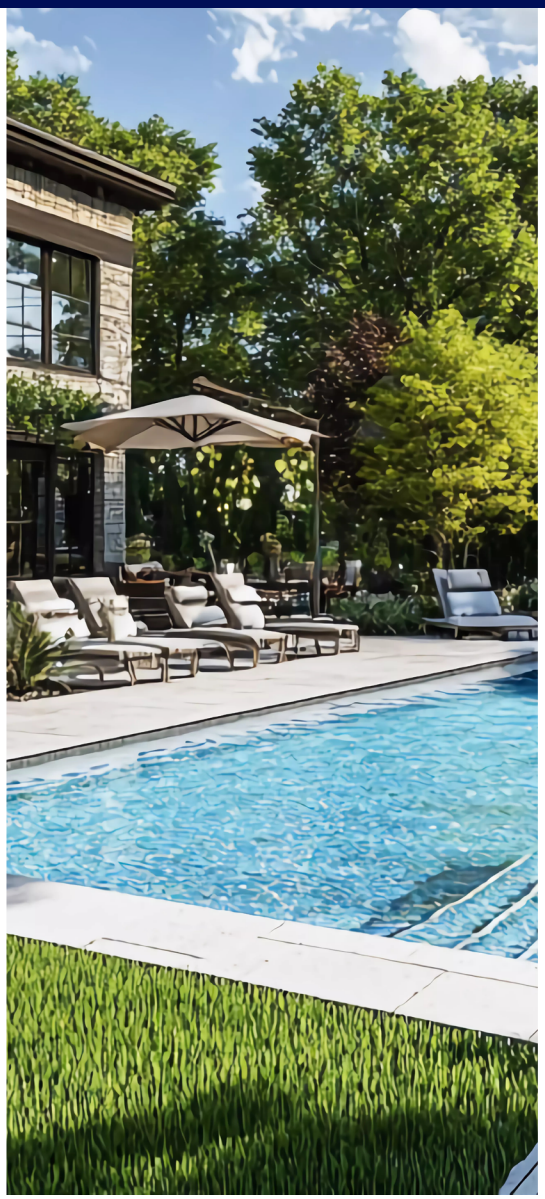
Copeland Heat Pumps

Comprehensive hot water solutions for commercial, residential and swimming pool applications



COPELAND

Heat pumps: a sustainable solution for water heating

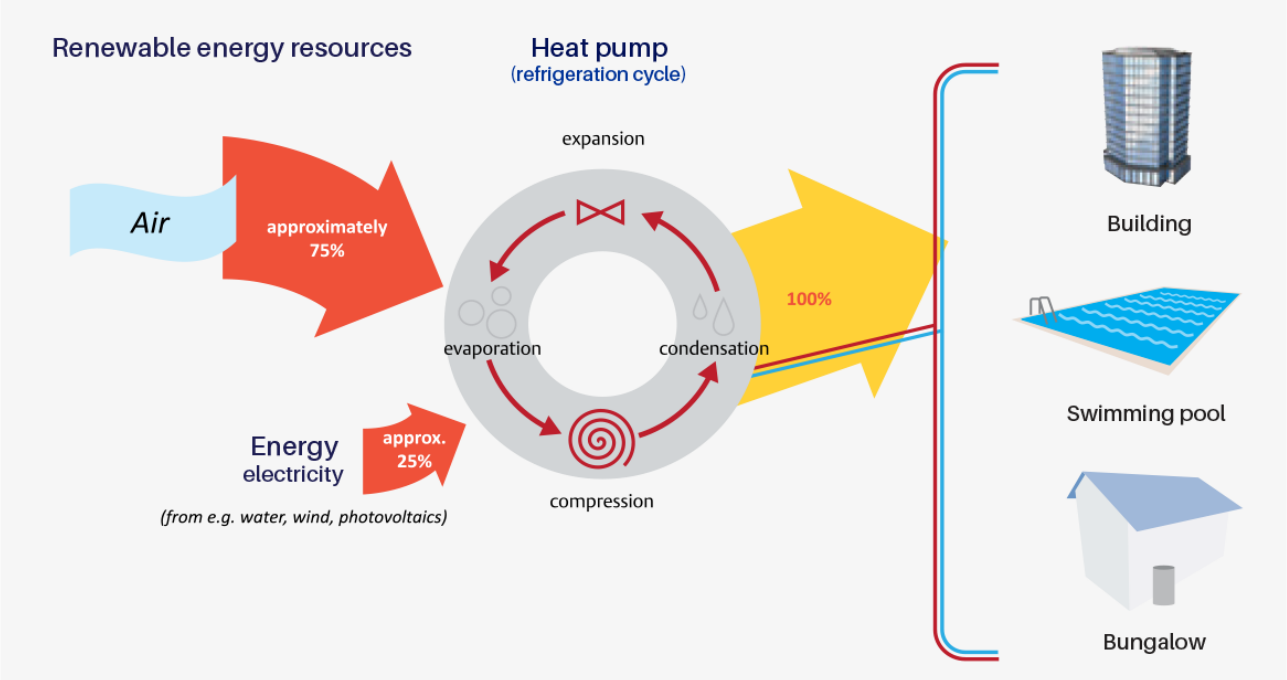
In today's era of soaring energy costs, heat pumps are the answer to your hot water needs. Traditional methods of heating water, such as electric water heaters and fossil fuel-burning systems, are proving to be increasingly expensive and environmentally unfriendly. So, how cost-effective are heat pumps for you? Heat pumps can save you up to 70% on energy costs and also dramatically reduce carbon footprints. To give you an idea, the average heating cost, calculated in₹/kW, is far more favorable for a heat pump. While electric heating costs you approximately ₹8.8/kW and LPG heating costs you ₹7/kW, a heat pump costs you a mere ₹1.2/kW! Imagine the savings over an entire year.

Copeland has developed a range of commercial and residential heat pumps that utilize naturally available heat from the air, ground, and water. These heat pumps are specifically designed for Indian conditions and deliver unmatched comfort and convenience. Copeland has also developed specialized heat pumps designed to heat swimming pool water to a precise temperature, allowing you to enjoy swimming all year round, regardless of the season.

Whatever your requirements, Copeland heat pumps, with their reliability and versatility, are the perfect choice.

Adaptable water heating for homes, business and industry

Efficient and sustainable: heat pump water heating technology



From air to comfort: understanding the heat pump process

Copeland offers several advantages over conventional water heating systems. Besides being more reliable and efficient, these systems 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 improved air quality.

Copeland heat pump series

World class water heating product built on proven scroll & reciprocating compressor platforms

Copeland heat pumps stand out as a significantly more efficient solution for water heating. They harness naturally available heat from water, the ground, and even winter air, employing a vapor compression refrigerant cycle that consumes nearly one-quarter of the electrical energy required for traditional water heating. With up to 70% reduction in energy consumption, this contributes to cleaner air.

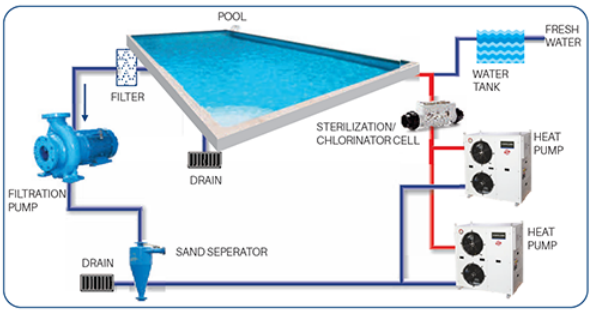
Copeland has developed a comprehensive range of water heating units, ranging from 100 Liters/Hr to 2,000 Liters/Hr. These units are built with heating-optimized reciprocating and Copeland ZW scroll compressors, providing seasonally efficient heating capacity and effective domestic hot water production in residential, commercial, and pool heating applications.

Copeland heat pumps are designed to deliver a water temperature of 60°C. They operate across a wide ambient temperature range, from 0°C to 43°C, and are equipped with best-in-class 'Shell & Tube' heat exchanger technology, making them easy to service and ideal for sites with poor water quality. Additionally, they feature a 'Simple User Interface'.

Enabling easy troubleshooting and providing advanced warnings about field failures, thereby reducing downtime and increasing the system's lifespan.

With all these benefits, the Copeland heat pump series stands out as the ultimate solution on the market, offering exceptional reliability.

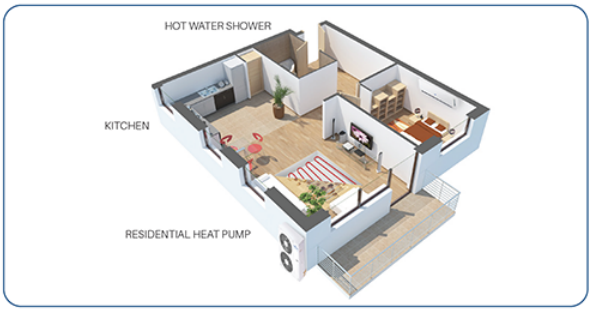
Pool heating system diagram



Note: This diagram for demonstration purposes only. For a detailed installation diagram please refer to the product manual.

Commercial heat pump water heating

Residential heat pump water heating



Copeland offers a wide range of reciprocating and ZW scroll compressors engineered to deliver a reliable water heating solution

Environmentally friendly design; zero Ozone Depletion Potential (ODP) refrigerant options available

60°C hot water available 24/7; independent of weather conditions

Significant energy savings, up to 70% compared to traditional heating systems

Automatic defrost module for low ambient operation

Reliable hydrophilic evaporator design for coastal or salty conditions

Adjustable water temperature and accurate temperature control

Corrosion-proof galvanized, powder-coated steel chassis with polyester coating

Designed & manufactured In india; customized for your requirement

Titanium tube in PVC shell condenser designed specifically to handle chlorinated water in a swimming pool heat pump

100% factory tested, inspected at Copeland's own labs and testing facilities

Anti-corrosion special coating on the copper tubing

Reliable and easy to maintain; designed for safe operation

What makes Copeland heat pumps unique?

Copeland ZW scroll compressor: dedicated for commercial and pool heating requirements

The Copeland ZW scroll compressor offers an energy-efficient alternative for hot water heating and space heating, making it the ideal substitute for electric heaters or fuel-fired boilers. Leveraging Copeland's extensive experience in manufacturing over 150 million scroll compressors globally recognized for their reliability and efficiency, the Copeland ZW compressor is built on this robust foundation. Incorporating scroll heating technology and several innovative product design features, ZW scrolls have been granted a new patent for these advancements and technological innovations.

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.

HOT WATER ASSURED

HOT WATER RELIABILITY

HIGH EFFICIENCY DESIGN

LOW LIFECYCLE COSTS

LOW AMBIENT PERFORMANCE

Copeland ZW excels over traditional AC compressors

Features	Traditional AC compressor	Copeland ZW advantage
Heating capacity	Standard	Exceptional
Coefficient of Performance	Standard	Exceptional
Highest water temperature	55°C	60°C (Heating optimized valve designed for high compression ratios)
Hot water reliability	Standard	Stronger and robust scroll design, high-power motor for operation at low ambient and higher condensing temperatures compared to AC compressors

Copeland ZW scroll compressors for water heating are engineered to cater to diverse winter ambient conditions across India. In tropical regions and areas with moderate winter ambients, the compressor is specifically designed without vapor injection.

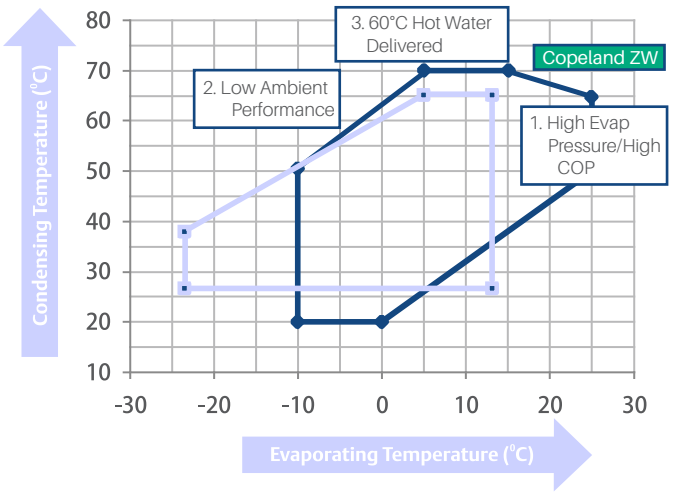
Reliable hot water

Water heating involves prolonged operating hours, especially at high load and compression ratios. The demand for hot water peaks when ambient temperatures are low, precisely when conventional heat pump capacity tends to decline. Copeland ZW**KA compressors are specifically engineered for robust and reliable performance in more demanding applications, ensuring effective operation even in ambient temperatures that do not drop below 0°C. These compressors exhibit significantly enhanced heating capacity, higher efficiency, and a minimal need to reduce water outlet temperatures.

Environmentally friendly design

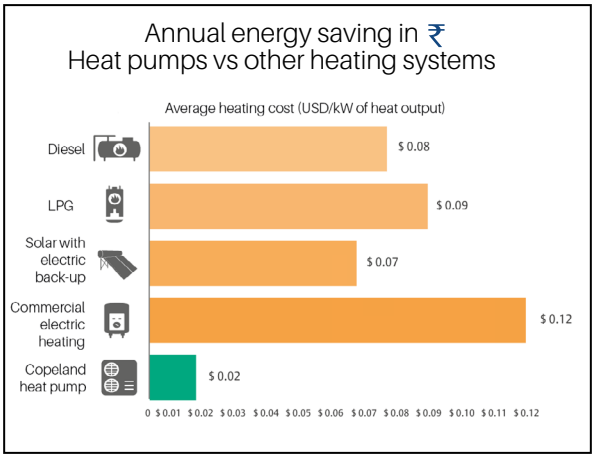
Copeland ZW compressors utilize low GWP (Global Warming Potential) refrigerants. Choosing ZW scroll compressors demonstrates a commitment to promoting green technology, contributing to both direct and indirect reductions in CO_2 emissions.

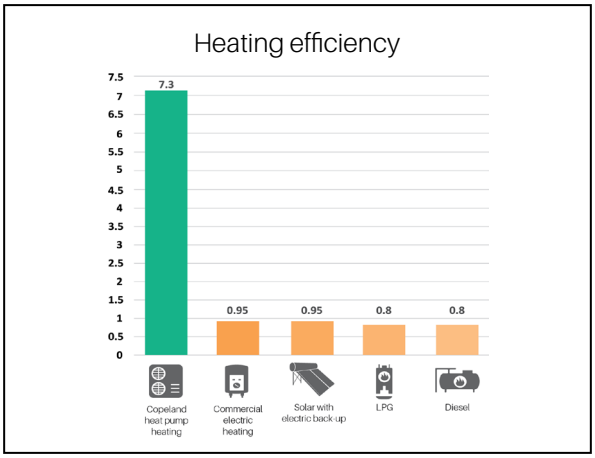
Copeland ZW vs traditional AC compressors



Delivering up to 70% energy savings vs traditional heating systems

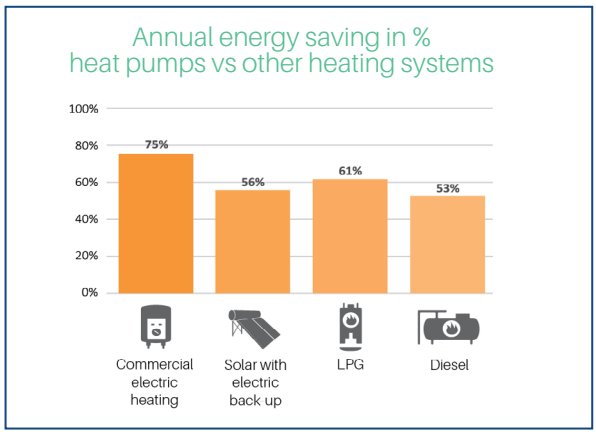
Pool size	Water IN temp	Water OUT temp	Heat pump approx. capacity	Swimming pool
100,000 Litres	20°C	28°C	43 kW	

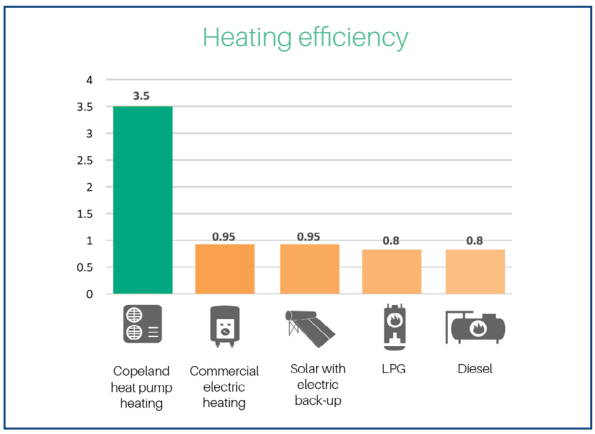




Delivering up to 70% energy savings vs traditional heating systems

Hot water qty/day	Water IN temp	Water OUT temp	Total heat energy	Number of showers/day	Commercial building
2,800 Litres	30°C	60°C	84,000 Kcal	70 Typical	





Note: The results shown in the analysis are for comparison purposes only. The assumptions and data used may change based on market conditions. Copeland is not responsible for any errors or misrepresentations in the data. If you have questions about the analysis, please contact your Copeland representative.

Copeland heat pumps: need of the hour

Solution to problems faced by challenges with traditional water heating methods:

Space constraints & high real estate costs

Inefficiency on overcast days

Heavy dependence on fossil fuels

Rising energy costs

Safety concerns & complex fuel ducting/piping

Easy to maintain & service

Water quality can often pose significant issues in hot water systems. It is crucial to assess the water for hardness, acidity, and iron content prior to installing a heat pump. Your contractor or equipment manufacturer can provide guidance on acceptable water levels. Failure to do so may lead to the accumulation of mineral deposits 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 are equipped with best-in-class 'Shell & Tube' heat exchanger technology. These are more straight forward to service compared to other available heat exchangers, such as Tube-in-Tube and Plate-type heat exchangers. Shell & tube heat exchangers stand out as the ideal solution for the Indian market, especially in areas with poor water quality on-site. All condenser models are easy to install and can be effortlessly opened for inspection, cleaning, and maintenance purposes.

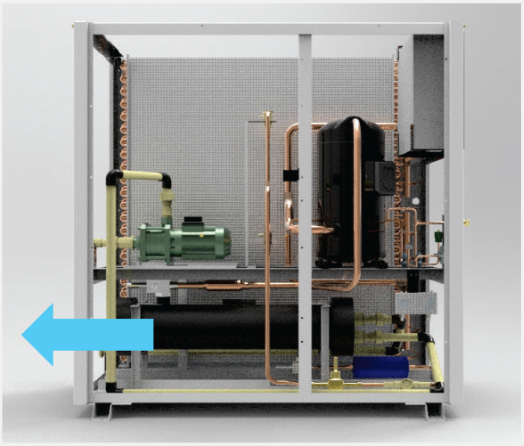
Characteristics	Shell & tube	Tube in tube	Plate type
Heat transfer efficiency	Comparable	Moderate	Moderate
Ability to handle high operating pressures & temperature	✓	Moderate	Limitation due to bonding material
Leakage concerns	Easy to locate leaks	Difficult	Difficult to locate leaks
Corrosion	Moderate	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

Designed for easy maintenance in the field

Individual components easily accessible

Service panels removable for access

Multiple compartment design for easy access to pump, compressor & components



Shell & tube HX slides out after disconnecting valves

Images shown above are for reference purpose only. Actual supply may vary depending upon model & scope.

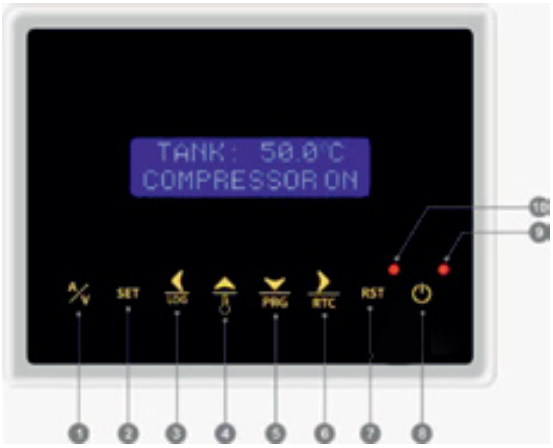
Simple to use & control: complete diagnostic capability & full electrical protection

Simple to use diagnostics features

The Copeland heat pump series is designed for simple and easy operation in various settings such as apartments, bungalows, hotels, hostels, restaurants, and swimming pools. These units come with a 'Simple User Interface,' allowing service teams to receive advance warnings about field failures, along with simple error codes for easy diagnosis and troubleshooting. This reduces downtime and increases the life of the system.

- Simple to use and control LED display for parametric control and 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 operations

Diagnostic features for easy troubleshooting



1. **Amp / voltage monitor key**
   View electrical data of heat pump
2. **Tank temp & parameter set key**
   Control tank temperature & other parameter
3. **Backward / log key**
   View alarms/faults during operation
4. **UP / probe for temp monitoring key**
   Increase pre-set temperature: scroll other parameters
5. **Down / programming key**
   Decrease pre-set temperature; scroll Other parameters
6. **Forward / real time clock key**
   Set real time clock, date, time etc.
7. **Reset key**
   Exit any mode
8. **Power on /off key**
   Switch on / off the heat Pump & controller
9. **Power LED**
   Visual indication of power
10. **Alarm signal LED**
    Visual indication of alarms / faults

System protector/end user

1. No incoming water flow
2. High discharge pressure cut off (manual reset only)
3. Low pressure cut off
4. Water tank temperature
5. Any part / sensor failure
6. Fuse failure display
7. Controller communication error
8. Daily usage programming capability
9. Communication port - to connect to laptop (RS485)
10. Installer password lock
11. Master password lock
12. Memory for last 30 errors occurred

Component protection

Compressor

1. Single phase, phase missing/reversal
2. Under/over voltage & current
3. High discharge temperature

Water pump

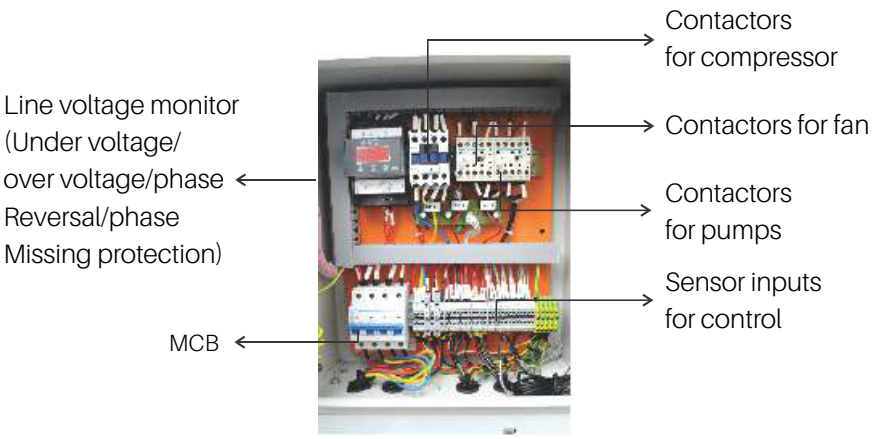
1. Dry run protection
2. High current protection

Fan motors

1. Healthy status
2. High current
3. 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



Model name			EHP-R010X-PBA-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	10 to 43	0 to 43	0 to 43
	Max.water Tempreture	°C	55	55	55
	Capacity	kW	3.5	5.2	7.0
	Input power	kW	1.3	1.70	2.20
	COP		2.7	3.1	3.2
	Current	A	7.9	9	13
	Refrigerant gas		R407C	R134a	R134a
Compressor	Type	-	Reciprocating	Reciprocating	Reciprocating
	Current	A	6.8	7.5	8.5
Fan motor	Quantity	pcs	1	1	1
	Supply	A	0.7	0.7	0.7
Water pump	Head	Feet	8	10	10
	Rating current	A	0.36	0.36	0.36
Heat exchanger	Type/model	-	Tube in tube	Tube in tube	Tube in tube
Water piping	Inlet pipe size	inch	25/ 1" BSP	25/ 1" BSP	25/ 1" BSP
	Outlet pipe size	inch	25 /1" BSP	25 / 1" BSP	25 /1 " BSP
Dimension	Dimension (D x W x H)	mm	355 x 905 x 625	355 x 905 x 625	355 x 905 x 625
	Approx.Weight	kg	72	84	86

Rating condition-rise in water temprature by 30° C, when ambeint of 25 °C & 65%RH, when initial temp,is 20°C

Model name			EHP-Z030X-TME	EHP-Z050X-TMB	EHP-Z075X-TMB	EHP-Z100X-TMB	EHP-Z140X-TMB	EHP-Z200X-TMB**
Nominal capacity		HP	3HP	5HP	7.5HP	10HP	15HP	20HP
Hot water capacity		LPH	300	500	750	1000	1400	2000
Heat Pump	Power supply		380V/50Hz/3Ph	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	0 to 43	0 to 43
	Max.water tempreture	°C	60	60	60	60	60	60
	Capacity	kW	11	18.4	26	36	52	72
	Input power	kW	3.26	5.0	7.5	10.1	15.0	20.1
	COP		3.4	3.7	3.5	3.6	3.5	3.6
	Current	A	5.6	9.8	20.3	21.4	41.2	43.9
	Refrigerant gas		R407C	R407C	R407C	R407C	R407C	R407C
Compressor	Type	-	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll
Fan motor	Quantity	pcs	1	1	2	2	2	2
	Power supply		230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph
Heat exchanger	Type/model	-	Tube & tube	Shell & tube	Shell & tube	Shell & tube	Shell & tube	Shell & tube
Water piping	Inlet pipe size	inch	1" BSP	1" BSP	1" BSP	1" BSP	1- 3/8" BSP	1 1/4" BSP
	Outlet pipe size	inch	1" BSP	1" BSP	1" BSP	1" BSP	1- 3/8" BSP	1 1/4" BSP
	Minimum water flow	LPH	1440	2800	4800	5000	10000	12500
Dimension	Dimension (D x W x H)	mm	505 x 1145 x 810	710 x 1235 x 1060	710 x 1270 x 1380	710 x 1270 x 1380	1092 x 1653 x 2201	1092 x 1879 x 2201
	Approx.Weight	kg	230	290	365	370	668	835

Rating condition-water temprature rise by 30°C at ambient of 25°C with rh of 65%, when initial temperature is 20°C

**Water temprature rise by 30°C at ambient of 27°Cwith RH of 65%

Models with in-built water pump require a power supply of 230V/1ph.

Model name			EHP-Z004K-TMP	EHP-Z008K-TMP	EHP-Z010K-TMP	EHP-Z017K-TMP	EHP-Z022K-TMP	EHP-Z034K-TMP
Pool Size			30 m^3	60 m^3	80 m^3	100 m^3	125 m^3	200 m^3
Nominal capacity		**HP**	3 HP	5 HP	7.5 HP	10 HP	15 HP	20 HP
Power supply		-	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph
Operating ambiant range		**°C**	0 to 35	0 to 35	0 to 35	0 to 35	0 to 35	0 to 35
Max. Water temparature		**°C**	35	35	35	35	35	35
Water heating	Capacity	**kW**	13	21	32	43	53	86
	Cop	-	5.5	5.4	5.4	5.6	4.4	5.5
Total input power		**kW**	2.3	4.0	5.9	7.7	12.1	15.6
	Max. Input current	**A**	5	7.6	14	16.5	29.1	34.5
	Refrigerant gas	-	R407C	R407C	R407C	R407C	R407C	R407C
Compressor	Type	-	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll	ZW Scroll
Fan motor	Quantity	**pcs**	1	1	2	2	2	2
	Power supply	-	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph	230V/50Hz/1Ph
Heat exchanger	Type/model	-	Titanium tube	Titanium tube	Titanium tube	Titanium tube	Titanium tube	Titanium tube
Water piping	Inlet pipe size	**Inch**	1 1/2" BSP	1 1/2" BSP	2" BSP	2" BSP	2" BSP	2" BSP
	Outlet pipe size	**Inch**	1 1/2" BSP	1 1/2" BSP	2" BSP	2" BSP	2" BSP	2" BSP
	Min. Water flow	**LPH**	3800	7300	9500	16500	20900	32300
	Max. Water flow	**LPH**	4600	9200	10500	18000	23100	35700
Dimension	Dimension (dxwxh)	**mm**	505 x 1150 x 870	710 x 1220 x 864	710 x 1250 x 1380	710 x 1250 x 1380	1092 x 1653 x 2201	1092 x 1880 x 2087
	Approx.Weight	**kg**	120	190	260	270	560	835

Rating condition - at ambient of 25°C & inlet water of 20°C; final water temperature of 28°C

Copeland heat pumps: tested at in-house laboratory for performance & reliability

- Dedicated test lab in Karad, India for heat pump reliability and performance testing
- Controlled room ambient temperature from 0°C to 46°C
- Monitoring various parameters with a measurement accuracy of +/-0.5%
- Simulation of real field issues and system correction
- Capability to measure water flow, temperature, pressures, electronics, and systems
- All instrument calibration conducted by NABL accredited labs
- Facility certifications:
  - QMS - ISO 9000
  - EMS - ISO 14000
  - Ul / iec stage - 3 / intertek
- Compliant with Copeland international guidelines

Measurement panel

Water chilling facility

UUT & control room

Accolades and recognitions

The consistent and efficient performance of Copeland heat pumps has been recognized and appreciated by the industry. Copeland heat pump received the prestigious National Energy Management Award for the year 2019, acknowledging its outstanding energy savings compared to its competitors.

Copeland heat pumps have been awarded the prestigious GreenPro Green product certification by CII (Confederation of Indian Industry) making it the only heat pump certified as GreenPro.

National Energy Management Award 2019 Innovative Energy Saving Product

Engineered & manufactured in India

System integrator partner network

Copeland has an extensive nationwide service network with trained technical experts to take care of your heat pump's after-sales needs. Wherever you may be in the country, you can expect a Copeland technician to address your servicing needs swiftly and efficiently.

Contact list

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Thane, Maharashtra 400607

COLD CHAIN CENTERS

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General information

Technical date stated in this document are correct at the time of printing. Updates may occur, and should you need confirmation of a specific value, please contact Copeland clearly stating the information required.

Copeland is not responsible for inadvertent typographical errors stated herein. Products, specifications and data in this literature are subject to change without notice.

The information given herein is based on data and tests which Copeland believes to be reliable and which are in accordance with today's technical knowledge. It is intended for use by persons having the appropriate technical knowledge and skill, at their own discretion and risk. Our products are designed and adapted for fixed locations. For mobile applications, failures may occur.

The suitability for this has to be assured from the plant manufacturer, which may include making appropriate tests.

Note:

The components listed in this catalogue are not released for use with caustic, poisonous or flammable substances. Copeland cannot be held responsible for any damage caused by using these substances.

About Copeland

Copeland is a global provider in sustainable heating, cooling, cold chain and industrial solutions. We help commercial, industrial, refrigeration and residential customers reduce their carbon emissions and improve energy efficiency. We address issues like climate change, growing populations, electricity demands and complex global supply chains with innovations that advance the energy transition, accelerate the adoption of climate friendly low GWP (Global Warming Potential) and natural refrigerants, and safeguard the world's most critical goods through an efficient and sustainable cold chain. We have over 18,000 employees, with feet on the ground in more than 40 countries - a global presence that makes it possible to serve customers wherever they are in the world and meet challenges with scale and speed. Our industry-leading brands and diversified portfolio deliver innovation and technology proven in over 200 million installations worldwide. Together, we create sustainable solutions that improve lives and protect the planet today and for future generations.

To learn more, visit **copeland.com**

COPELAND