

# Copeland heat pumps

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





## *Heat pumps: a sustainable solution for hot water heating*

### **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



### **Bungalows**

**30° to 60°C**

- Swimming pool
- Steam bath



### ***Adaptable heating for homes, businesses, and industry***

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 environmental pollution.

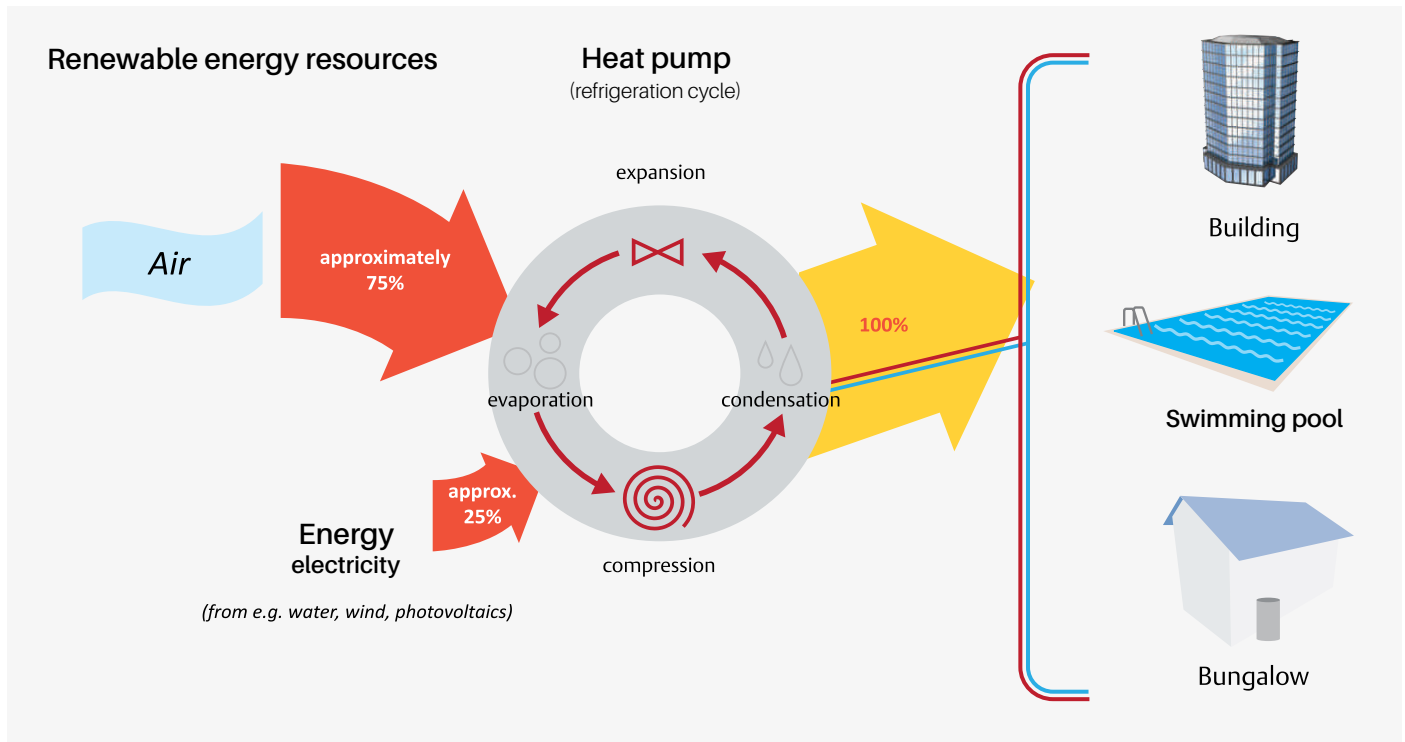
To give you an idea, the average heating cost, calculated in ₹/kW, is far more favorable for a heat pump. While electric heating costs you approximately ₹8.8/kW and LPG heating costs you ₹7/kW, a heat pump costs you a mere ₹1.2/kW! Imagine the savings over an entire year.

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.



## 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 heating product built on proven scroll & reciprocating platforms**

Copeland heat pumps stand out as a significantly more efficient solution for water heating. It harnesses 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 a 75% reduction in energy consumption, this contributes to cleaner air.

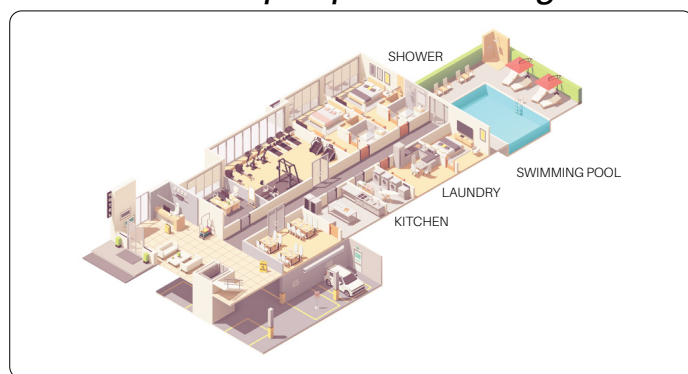
Copeland has developed a comprehensive range of water heating units, ranging from 100 liters/hr to 2,000 liters/hr. These units are built with heating-optimized reciprocating and Copeland ZW scroll compressors, providing seasonally efficient heating capacity and effective domestic hot water production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

Available for use with multiple refrigerants such as R407C and R22, 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

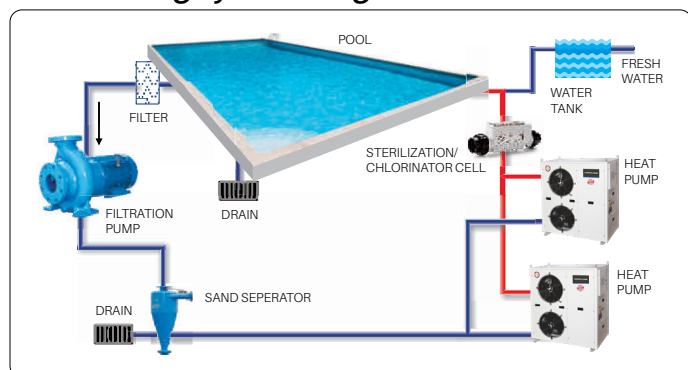
equipped with best-in-class 'shell & tube' heat exchanger technology, making them easy to service and ideal for sites with poor water quality. Additionally, they feature a 'simple user interface,' enabling easy troubleshooting and providing advance warnings about field failures, thereby reducing downtime and increasing the system's lifespan.

With all these benefits, the Copeland heat pump series emerges as the most reliable solution available on the market. Copeland further supports water heater contractors worldwide by offering specifically designed units tailored for water heating applications in the market.

### **Commercial heat pump water heating**

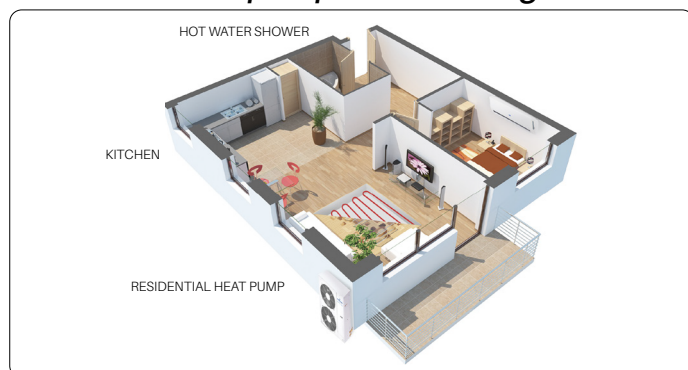


### **Pool heating system diagram**



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

### **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 ODP refrigerant options available



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



Automatic defrost module for low ambient operation



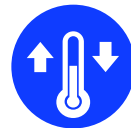
Significant energy savings, up to 75-85% compared to traditional heating systems



Reliable hydrophilic evaporator design for coastal or salty conditions



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



Adjustable water temperature and accurate temperature control



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



Anti-corrosion special coating on the copper tubing



Reliable and easy to maintain; designed for safe operation



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



## What makes Copeland heat pumps unique?

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



Hot water assured



Hot water reliability



High efficiency design



Low lifecycle costs



Low ambient performance

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 secured a new patent for the aforementioned advancements and technological features.



### 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 excels over traditional AC compressors

Features	Traditional AC compressor	Copeland ZW advantage
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 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.

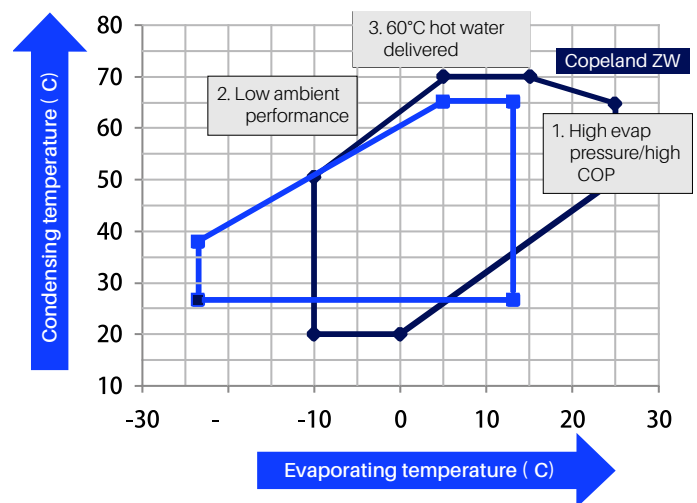
### Reliable hot water

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<sub>2</sub> emissions.

### Copeland ZW vs traditional AC compressors





## Copeland heat pump offers best ROI & lower operating costs

**Sustainable, energy efficient &  
a reliable alternative to existing heating technologies**

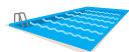
**Delivering up to 75% energy savings vs traditional heating systems**

Pool size  
**100,000**  
- litres -

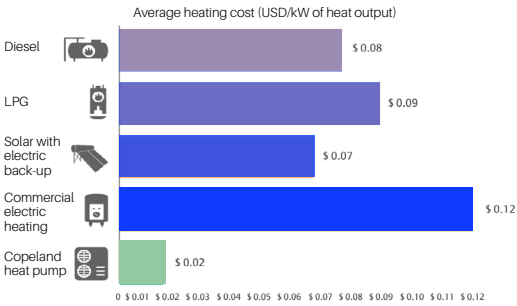
Water **IN** temp  
↓ **20°C**

Water **OUT** temp  
↕ **28°C**

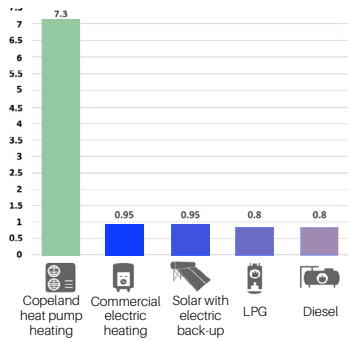
Heat pump approx capacity  
**43 kW**

Swimming pool  


Annual energy saving in ₹  
heat pumps vs other heating systems



Heating efficiency



**Delivering up to 75% energy savings vs traditional heating systems**

Hot water qty/day  
**2,800**  
- litres -

Water **IN** temp  
↓ **30°C**

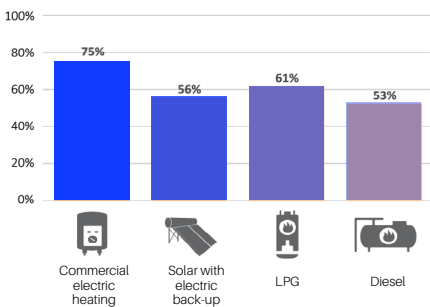
Water **OUT** temp  
↕ **60°C**

Total heat energy  
**84,000**  
- kcal -

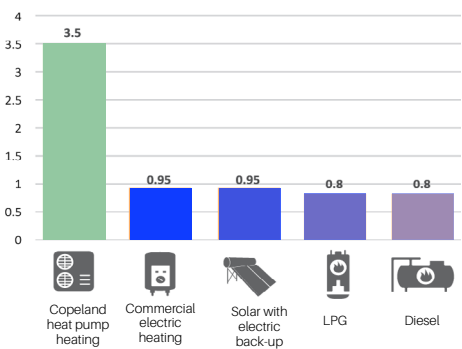
Number of showers/day  
**70**  
- typical -

Commercial building  


Annual energy saving in %  
heat pumps vs other heating systems



Heating efficiency



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 comparison versus competing technologies

Heat pump technology scores across all parameters



Parameters	Copeland heat pump	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 <sup>st</sup> year	No	No

## Copeland heat pumps: need of the hour

Solution to problems faced by traditional water heating methods



Lack of space  
Costly real-estate



Overcast days



High fossil  
fuel usage



Rising electric bills



Safety/fuel  
ducting & piping

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.



*Easy to maintain & service*

***Poor water quality leads to scaling issues and abnormal operating conditions***

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 straightforward 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*

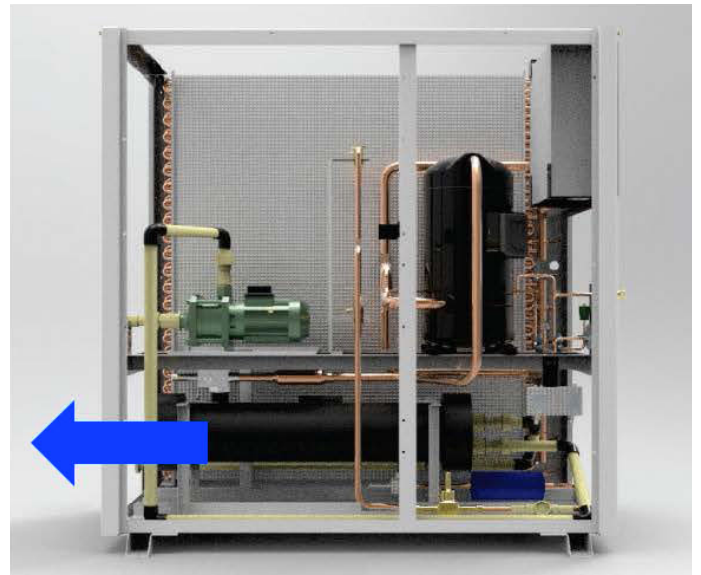
Individual components easily accessible



Service panels removable for access



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



Shell & tube HX slides out after disconnecting valves



**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**

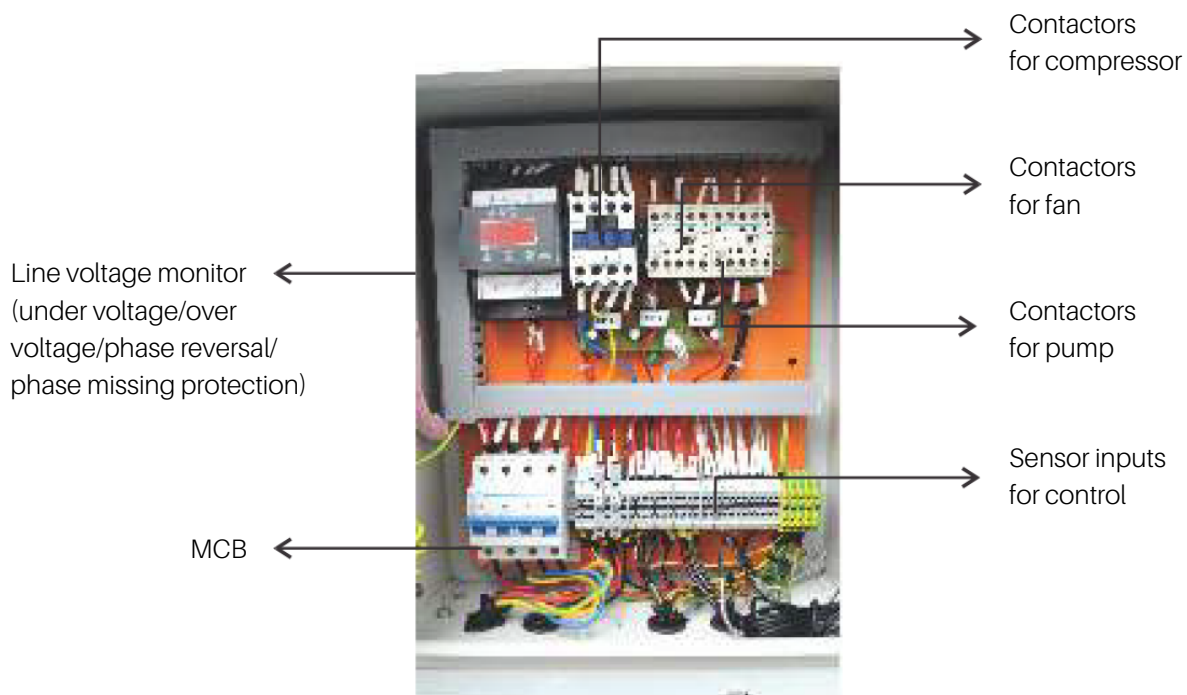
1. Dry run protection
2. High current protection

### **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
- Auto defrost feature for low ambient weather





## Copeland residential & commercial heat pump

### Technical specifications

Model name			EHP-R010X-PBA	EHP-R015X-PGX	EHP-R020X-PGX
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	0 to 43	0 to 43
	Max. water temperature	°C	55	55	55
	Capacity	kW	3.5	5.2	7
	Input power	kW	1.2	1.7	2.2
	COP		3	3.2	3.3
	Current	A	7.7	9	13
	Refrigerant gas		R407c	R134a	R134a
Compressor	Type		Reciprocating	Reciprocating	Reciprocating
	Current	A	6	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	1" BSP	1" BSP	1" BSP
	Outlet pipe size	Inch	1" BSP	1" BSP	1" BSP
Dimensions	Dimension (DxWxH)	mm	355 x 905 x 625	355 x 905 x 625	355 x 905 x 625
	Approx. weight	Kgs	72	84	86

# Rating condition - at ambient of 25°C & inlet water of 20°C; final water temperature of 55°C  
For specific variants, please contact Copeland sales representative

## Technical specifications

Model name			EHP-Z030X-TBX	EHP-Z050X-TBX	EHP-Z075X-TBX	EHP-Z100X-TBX	EHP-Z200X-TBX
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	0 to 43
	Max. water temperature	°C	60	60	60	60	60
	Capacity	kW	11	17.4	26	36	68
	Input power	kW	3.4	5	7.5	10.1	20.1
	COP		3.3	3.5	3.5	3.6	3.4
	Current	A	5.6	9.8	20.3	21.4	43.9
	Refrigerant gas		R407C	R407C	R407C	R407C	R407C
Compressor	Type		ZW scroll	ZW scroll	ZW scroll	ZW scroll	ZW scroll
Fan motor	Quantity	pcs	1	1	2	2	2
	Power supply		230V/1Ph	230V/1Ph	230V/1Ph	230V/1Ph	230V/1Ph
Heat exchanger	Type/model		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 ¼" BSP
	Outlet pipe size	Inch	1" BSP	1" BSP	1" BSP	1" BSP	1 ¼" BSP
	Minimum water flow	LPH	1400	2800	4800	5000	12500
Dimensions	Dimension (DxWxH)	mm	505 x 1145 x 810	710 x 1235 x 1060	710 x 1270 x 1380	710 x 1270 x 1380	1092 x 1879 x 2201
	Approx. weight	kg	230	290	365	370	835

# Rating condition - at ambient of 25°C & inlet water of 20°C; final water temperature of 55°C  
 For specific variants and high temp heat pump, please contact Copeland sales representative  
 For 3 and 5 HP models, tube in tube option is also available  
 Models with in-built water pump require a power supply of 230V/1Ph





## Copeland swimming pool heat pump

### Technical specifications

Model name			EHP-Z004K-TBP	EHP-Z008K-TBP	EHP-Z010K-TBP	EHP-Z017K-TBP	EHP-Z034K-TBP
Pool size			30 m³	50 m³	80 m³	100 m³	200 m³
Nominal capacity			3HP	5HP	7.5HP	10HP	20HP
Power supply			380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph	380V/50Hz/3Ph
Operating ambient range		℃	0 to 35	0 to 35	0 to 35	0 to 35	0 to 35
Max. water temperature		℃	35	35	35	35	35
Water heating	Capacity	kW	12.65	21.3	31.7	40.7	83.4
	COP		5.5	5.4	5.4	5.3	5.3
Total input power		kW	2.3	4	5.9	7.7	15.6
	Max. input current	A	5	7.6	14	16.5	34.5
	Refrigerant gas		R407C	R407C	R407C	R407C	R407C
Compressor	Type		ZW scroll	ZW scroll	ZW scroll	ZW scroll	ZW scroll
Fan motor	Quantity	pcs	1	1	2	2	2
	Power supply		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
Water piping	Inlet pipe size	Inch	1.5"	1.5"	2"	2"	2"
	Outlet pipe size	Inch	1.5"	1.5"	2"	2"	2"
	Min. water flow	LPH	3800	7300	9500	16500	35700
	Max. water flow	LPH	4600	9200	10500	18000	32300
Dimensions	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 1880 x 2087
	Approx. weight	Kg	120	190	260	270	810

# Rating condition: ambient temperature of 25°C, inlet water temperature of 20°C; achieving a 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 Green Pro

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.





A photograph of a modern interior space. On the left, a large wall is covered in vertical wooden slats. The word "COPELAND" is mounted on this wall in large, bold, black, sans-serif capital letters. To the right, a blue wall features the text "ENGINEERED FOR SUSTAINABILITY" in a gold, serif font, angled upwards. The floor is made of light-colored square tiles with a dark rectangular section in the foreground.

# COPELAND

ENGINEERED FOR  
SUSTAINABILITY

## About Copeland

Copeland is a global leader in sustainable heating, cooling, refrigeration 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 50 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. For more information, visit [copeland.com](https://copeland.com).

To learn more, visit [copeland.com](https://copeland.com)

India 02 00 (02/24) Copeland heat pumps  
©2024 Copeland LP.

# COPELAND