

# REDSTONE

REDSTONE TECHNO ENGINEERS PVT. LTD.

## Industrial hot water. Residential electricity bills.

The Redstone Heat Pump (RHP) Series — designed and manufactured in India, built on the Emerson Copeland Scroll platform, engineered for Indian water and climate conditions.

**75%**

LESS ENERGY THAN  
ELECTRIC GEYSERS

**400%**

SYSTEM EFFICIENCY  
(COP >3.5)

**60°C**

HOT WATER OUTPUT,  
GUARANTEED 24/7

**120M+**

COPELAND SCROLL  
COMPRESSORS  
DEPLOYED WORLDWIDE

## WHY TRADITIONAL WATER HEATING IS BLEEDING MONEY

# You're converting energy the hard way — and paying for it.

Conventional electric heaters and boilers operate at efficiencies below 1.0. That means they consume more energy than they deliver as heat. As energy costs rise and CO<sub>2</sub> pressure mounts, this is no longer just inefficient — it's a liability.



## Electricity Costs

Electric geysers and immersion heaters run at efficiencies below 95%. For a 100-room hotel running year-round, that's ₹8–15 lakhs in water heating bills annually — with no ceiling in sight as tariffs rise.



## Boilers & Fossil Fuels

LPG and diesel-fired boilers operate at 70–80% efficiency at best, emit direct CO<sub>2</sub>, require regular maintenance, and are increasingly subject to regulatory pressure. They also stop working when fuel supply is disrupted.



## Solar Water Heaters

Solar is climate-dependent. Monsoon, overcast days, and demand spikes during morning and evening hours make it an unreliable standalone solution for commercial properties. Backup heating restores the cost problem.

## COP COMPARISON

## ELECTRIC

&lt;1.0

## COMBUSTION

&lt;0.8

## HEAT PUMP

&gt;3.5

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## THE TECHNOLOGY

# Heat pumps don't generate heat. They move it.

A heat pump extracts thermal energy already present in the ambient air and transfers it to water via a vapor compression refrigerant cycle — the same technology that cools your air conditioner, but running in reverse and optimized for water heating.

## HOW IT WORKS — 4 STEPS

1

**Evaporation**

Warm ambient air passes over the evaporator. Refrigerant absorbs heat from the air and vaporizes.



2

**Compression**

Copeland Scroll compressor raises the pressure and temperature of the vapor dramatically.



3

**Condensation**

Hot refrigerant passes through the Shell & Tube heat exchanger, transferring heat to the water.



4

**Expansion**

Refrigerant pressure drops via the TXV valve, restarting the cycle. Repeat, continuously.

**75%****RENEWABLE HEAT**

Three-quarters of the energy used comes from ambient air — a free, renewable source.

**25%****ELECTRICITY IN**

Only one unit of electrical energy needed to pump three units of heat from the environment.

**>3.5****COP ACHIEVED**

Coefficient of Performance exceeds 3.5 — meaning every rupee of electricity delivers 3.5x in hot water value.

**60°C****OUTPUT TEMPERATURE**

Consistent output regardless of ambient conditions, seasonal variation, or demand peaks.

## ENERGY FLOW

**1  
kWh**Electricity  
Input

+

**2–3  
kWh**Ambient Heat  
(Free)

=

**3–4  
kWh**Hot Water  
Output

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## WHY REDSTONE SPECIFICALLY

# Built different. Because India is different.

Generic heat pumps fail in Indian conditions — hard water, fluctuating power supply, wide ambient temperature ranges, high load hours. The RHP Series is engineered from the ground up for the Indian market, not adapted for it.

## Emerson Copeland Scroll Technology

The same compressor platform behind 120+ million global deployments. Now optimized for water heating and Indian climate conditions.

**120 Million Scrolls Deployed**

### Shell & Tube Heat Exchanger

Unlike plate or tube-in-tube types, Shell & Tube exchangers can handle any water quality — including the hard, scaling-prone water common across Indian installation sites. Easy to inspect, clean, and maintain without specialized equipment.

### Designed for Indian Ambient Conditions

Operates reliably between 10°C and 43°C ambient temperature. Copeland Scroll compressors configured without vapor injection for tropical and moderate-climate regions — a deliberate design choice, not a cost-saving one.

### Hydrophilic Evaporator Coating

Purpose-built for coastal and high-humidity environments where standard evaporators corrode and fail within 2–3 seasons. The hydrophilic coating extends operational life dramatically in salty air conditions.

### Multiple Compartment Serviceability

Every major component — compressor, pump, heat exchanger, controls — is accessible in the field without full disassembly. This is a significant differentiator when a unit goes down at 6am in a hotel with 200 guests waiting for showers.

### Dual Refrigerant Compatibility

Compatible with both R22 and R407C, providing flexibility for installations with existing refrigerant supply chains and making future refrigerant transitions straightforward without replacing the entire unit.

### 100% Factory Tested

Every unit is tested at Redstone's dedicated heat pump testing facility before dispatch. Not batch-sampled — individually verified. Reduces commissioning time and eliminates site surprises.

COPELAND SCROLL VS. TRADITIONAL AC SCROLLS

# Why a water heating scroll compressor is fundamentally different

Standard air conditioning scroll compressors are optimized for cooling loads — periodic, moderate-demand, moderate-compression-ratio operation. Water heating systems run continuously at high load and elevated compression ratios, particularly during cold ambient conditions. Redstone's Copeland Water Heating Scroll (ZW series) is purpose-engineered for this operating profile, not adapted from it.

| Criteria                | Traditional AC Scroll                  | Copeland Water Heating Scroll (ZW)                   |
|-------------------------|----------------------------------------|------------------------------------------------------|
| Heating Capacity        | Standard baseline                      | 16–22% higher than standard                          |
| COP (Efficiency)        | Standard baseline                      | 16–22% more efficient than standard                  |
| Max Water Temperature   | 55°C                                   | 60°C — optimized valve for high compression          |
| Low Ambient Performance | Degrades below 15°C                    | Reliable at ambient temperatures above 0°C           |
| Motor Design            | Standard efficiency motor              | High-power motor minimizing internal energy loss     |
| Hot Water Reliability   | Moderate — designed for cooling cycles | Stronger scroll, robust for extended high-load hours |
| Axial Compliance        | Fixed pressure design                  | Dynamic adaptation to varying pressure conditions    |

## KEY DESIGN INNOVATION

The ZW scroll features a specially designed axial compliance and pressure balance system. This allows it to perform across a wider operating envelope than standard compressors — critical for heat pump water heating where demand peaks in colder ambient conditions, precisely when conventional compressor performance drops.

16–22%

HIGHER COP THAN  
STANDARD SCROLLS

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## HEAD TO HEAD

# Heat pump vs. every alternative you're considering

Heat pump technology scores across all parameters – including the ones facilities managers and finance teams actually care about.

| Parameter                              | Heat Pump (RHP) | Solar Water Heater | Electric Geyser | LPG Fired   | Diesel Fired |
|----------------------------------------|-----------------|--------------------|-----------------|-------------|--------------|
| Energy Savings vs. Conventional        | Upto 75%        | 60–75%             | N.A.            | N.A.        | N.A.         |
| Space Requirement                      | 5% of Solar     | Baseline           | 5% of Solar     | 5% of Solar | 5% of Solar  |
| Climate Independent                    | Yes             | No                 | N.A.            | N.A.        | N.A.         |
| System Efficiency                      | Upto 400%       | Upto 95%           | Upto 95%        | Upto 80%    | Upto 80%     |
| Maintenance                            | Minimal         | Panel Cleaning     | High            | Moderate    | High         |
| Environment Friendly                   | Yes             | Yes                | Yes             | No          | No           |
| Safety                                 | Yes             | Yes                | Moderate        | No          | Moderate     |
| 80% Depreciation Benefit (Yr 1)        | Yes             | Yes                | No              | No          | No           |
| CO <sub>2</sub> Reduction vs. Electric | -55%            | -50%+              | Baseline        | Worse       | Worse        |

**Note on 80% Depreciation:** Heat pumps and solar water heaters qualify for 80% accelerated depreciation in the first year under India's Income Tax Act (energy-saving devices). This significantly improves payback period calculations and is often overlooked in procurement decisions.

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GET CUSTOM ROI ANALYSIS  
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## WHERE RHP SERIES IS DEPLOYED

# One platform. Every commercial hot water need.

From a 30-room hostel to a 300-bed hospital, the RHP Series scales with capacity and is configured for the specific temperature and volume requirements of each application.

**H****Hotels****20°C – 60°C**

SANITARY

KITCHEN

LAUNDRY

POOL (OPTIONAL)

The single highest-ROI application. Hotel guests consume 80–120 litres of hot water per room per day on average. A 100-room property running electric backup heating is typically losing ₹8–12 lakhs annually compared to an RHP installation. Morning and evening demand peaks are handled by the always-on system architecture — no warmup lag, no pressure drops.

**+****Hospitals****60°C — Consistent temperature critical**

STEAM BATHS

LAUNDRY

STERILIZATION

PATIENT WARDS

Hospitals cannot tolerate hot water supply interruptions or temperature inconsistency. The RHP Series delivers 60°C output independent of ambient conditions or time of day, with comprehensive fault warning systems and component-level protection. Redundant installations (parallel units) are recommended for critical care facilities.

**R****Restaurants****20°C – 60°C**

UTENSILS

DISHWASHING

FOOD PREP

Restaurant hot water demand is intensely peak-heavy — pre-service and post-service rushes that overwhelm geyser systems. The RHP storage-plus-heat-pump architecture ensures hot water is available on demand throughout service without pressure drops or temperature fluctuation during peak hours.

**B****Hostels****55°C – 60°C**

SANITARY

BULK SUPPLY

Hostels have the most concentrated demand profiles — everyone wants hot water between 6am and 9am. A single 10 HP RHP unit (650 LPH) can typically service 60–80 rooms. Multiple units in parallel scale to any property size without complex infrastructure changes.

## ADDITIONAL APPLICATIONS

## Spas, Bungalows &amp; Industrial Settings

S

## Spas &amp; Bungalows

30°C – 60°C

SWIMMING POOL

STEAM BATH

JACUZZI

Pools require sustained low-temperature heating — the ideal operating point for maximum heat pump COP. A single RHP unit running continuously can maintain a 25,000-litre pool at target temperature far more economically than any alternative.

I

## Industrial / Canteens

Custom — up to 60°C

PROCESS HEATING

LAUNDRIES

CANTEENS

Manufacturing facilities, garment factories, and large institutional canteens with consistent hot water needs are strong candidates. Redstone provides custom engineering assessments for non-standard industrial applications.

## A note on Indian water quality

Poor water quality is the most common cause of premature heat pump failure across India. Hard water causes mineral scaling in heat exchangers; acidic water causes corrosion; iron-heavy water causes fouling. Before installation, Redstone recommends testing water for hardness, acidity, and iron content. Our Shell & Tube condensers are specifically chosen for their ability to handle any water quality condition — and their design allows easy physical cleaning with a brush, without disassembly or specialized tools.

## Shell &amp; Tube

Handles any water quality · Easy brush cleaning ·  
Moderate corrosion · Easy leak detection

## Plate Type (avoid)

Needs treated water · Difficult maintenance · Titanium  
corrosion risk · Hard to locate leaks

FOR THE ENGINEER ON THE PROJECT

# Model specifications — 3HP / 5HP / 10HP

All models operate on 380V/50Hz/3Ph supply. Ambient operating range 10°C to 43°C. Max water temperature 60°C. Shell & Tube heat exchangers standard across all models.

| Parameter                 | Unit    | 3 HP<br>RHP-Z030X-TEA/TBA | 5 HP<br>RHP-Z050X-TEA/TBA | 10 HP<br>RHP-Z100X-TEA/TBA |
|---------------------------|---------|---------------------------|---------------------------|----------------------------|
| WATER HEATING PERFORMANCE |         |                           |                           |                            |
| Heating Capacity          | kW      | 12                        | 18                        | 24                         |
| Input Power               | kW      | 3.2                       | 5.0                       | 6.5                        |
| COP                       | —       | 3.8                       | 3.6                       | 3.8                        |
| Hot Water Output          | LPH     | 350                       | 550                       | 650                        |
| Max Input Current         | A       | 7.1                       | 10.5                      | 15                         |
| Refrigerant               | —       | R22 / R407C               | R22 / R407C               | R22 / R407C                |
| Refrigerant Qty.          | Kg      | 1.5                       | 2.4                       | 4.2                        |
| COMPRESSOR                |         |                           |                           |                            |
| Type                      | —       | Scroll / ZW               | Scroll / ZW               | Scroll / ZW                |
| Capacity                  | kW      | 10.1                      | 18.1                      | 24                         |
| Input Power               | kW      | 2.5                       | 4.6                       | 6.5                        |
| FAN MOTOR & WATER PUMP    |         |                           |                           |                            |
| Fan Qty.                  | pcs     | 1                         | 1                         | 2                          |
| Fan Power                 | W       | 160                       | 200                       | 160                        |
| Water Pump Power          | kW      | 0.39                      | 0.39                      | 0.55                       |
| Pump Head                 | feet    | 15                        | 20                        | 20                         |
| Min. Water Flow (Rec.)    | LPH     | 1400                      | 2800                      | 5000                       |
| PHYSICAL                  |         |                           |                           |                            |
| Dimensions (D×W×H)        | mm      | 490×1110×790              | 710×1250×1000             | 710×1265×1335              |
| Approx. Weight            | Kg      | 190                       | 230                       | 400                        |
| Inlet / Outlet Pipe       | mm/inch | 19 / 0.75"                | 25 / 1"                   | 25 / 1"                    |

## HOW TO READ A MODEL NUMBER

# Nomenclature — RHP Series

Each model designation encodes technology type, capacity, refrigerant, power supply, and design variant. Use this guide when specifying or ordering.

R · H · P – Z · 030 · X – X · X  
· X – XXX

R · H · P

**Brand & Family**

Positions 1–3: Redstone Heat Pump identifier

Z / R / S

**Compressor Technology**

Z = Scroll (recommended)  
R = Reciprocating  
S = Semi Hermetic

030

**Capacity (Litres/Hr)**

Numeric value × multiplier  
X = ×10 | K = ×1000  
E.g., 030 × 10 = 300 LPH

T / P

**Power Supply**

T = 380–420V / 50Hz / 3Ph  
P = 220–240V / 50Hz / 1Ph

E / G / B

**Refrigerant**

E = R22  
G = R134a  
B = R407C

A / B / C

**Design Variant**

Design variant designation  
Confirmed at order stage

## EXAMPLE MODEL NUMBERS

**RHP-R025X-TEA-100** Reciprocating · 250 LPH · R22 · 3-Phase

**RHP-Z025X-PGA-500** Scroll · 250 LPH · R134a · 1-Phase

**RHP-Z500X-TBA-999** Scroll · 5000 LPH · R407C · 3-Phase

DESIGNED FOR REAL-WORLD UPTIME

# Simple controls. Comprehensive protection.

The RHP Series is designed for operation by hotel and facility staff — not HVAC engineers. The system interface provides plain-language fault codes and early warnings before failures occur, minimising downtime and service call frequency.



## LED Display Interface

Parametric control and fault analysis via LED panel. Temperature setpoints, operating mode, and system status visible at a glance without opening the unit.



## Early Warning System

System monitors performance trends and flags early warning alerts before a component failure becomes a breakdown — giving maintenance teams time to respond before guests notice.



## RS485 Connectivity

Computer connectivity via RS485 interface for centralized monitoring, logging, and diagnostics. Compatible with building management systems for multi-unit installations.



## Weatherproof Enclosure

IP-rated enclosure designed for rooftop and outdoor installation without additional shelter. Handles monsoon, coastal humidity, and direct sun exposure.



## Daily Scheduling

Programmable timer allows scheduling heat pump operation during off-peak electricity tariff hours — reducing running costs without reducing hot water availability at peak times.



## 100% Component Protection

Full diagnostics and running status for every component. Protection covers all critical failure modes — the system will shut down safely before component damage occurs.

## Complete Electrical Protection

### Compressor

Single phase / phase missing / reversal  
Under/over voltage & current  
High discharge temperature  
Overload protector

### Water Pump

Dry run protection  
High current protection  
Overload protector

### Fan Motors & General

Healthy status monitoring  
High current protection  
Single fan failure detection  
MCB / Fuse as standard  
Under/low voltage protection

# REDSTONE

REDSTONE TECHNO ENGINEERS PVT. LTD.

Redstone is a Hyderabad-based engineering company delivering innovative heating, automation, and energy solutions for **industrial, commercial, and residential markets** across India.

Our RHP Series is built on **Emerson's Copeland Scroll compressor platform** — the world's most widely deployed scroll compressor technology — and is engineered specifically for Indian ambient conditions, water quality, and operating requirements. Every unit is designed and assembled in India, 100% factory tested at our dedicated heat pump testing facility, and backed by technical support from our Hyderabad base.

We don't sell a generic European heat pump into the Indian market and call it localized. We build for India from the ground up.

**120M+**

COPELAND SCROLLS  
DEPLOYED GLOBALLY

**75%**

MAX ENERGY SAVINGS OVER  
CONVENTIONAL

**100%**

FACTORY TESTED BEFORE  
DISPATCH

**48hr**

CUSTOM QUOTE  
TURNAROUND

## Get in Touch

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