



Cooling and Heating



Energy Efficient **Cooling** and  
**Heating** Solutions



# Conserving Resources, Preserving the Future.

Thermax provides systems and solutions in the critical domains of energy and the environment. The products and services developed by Thermax help industries achieve better resource productivity and improved bottom lines while maintaining a cleaner environment. The company's vision for the future is firmly anchored in the belief that, to stay competitive, businesses need to adopt sustainable practices.

Thermax's product portfolio covers heating, cooling, water and waste management, and specialty chemicals. The company also designs, builds, and commissions large boilers for steam and power generation, turnkey power plants, waste-to-energy systems and air pollution control projects.

## Absorption Cooling and Heating Solutions

### Good for business, better for the environment

Absorption Cooling and Heating is a unit of Thermax Limited, a leading provider of energy and environment solutions based in Pune, India. We are a global leader in providing sustainable cooling and heating solutions for industrial refrigeration, air

conditioning, and process cooling and heating. We offer an extensive range of solutions that use waste heat from steam, hot water, thermic fluid, exhaust gases and so on as an energy source and employ and operate on natural refrigerant, water

**100+**  
Applications

Serving  
**95+**  
Countries

**50+**  
Industries

**7800+**  
Absorption  
Chillers  
installations

**150+**  
Heat pump  
installations

**Pioneers**  
of Absorption  
Cooling and  
Heating  
Technology

## Rooted in India. Trusted across the globe.

Thermax embraces an attentive relationship with customers to address their energy and environmental challenges and boost the performance and profits of their businesses. With integrated energy - environment

expertise and a proven record of accomplishment in global markets, Thermax is the preferred partner of enterprises across industrial sectors in more than 90 countries.

# Smart and sustainable manufacturing unit



The highest quality and maximum reliability are ensured in every solution that leaves Industry 4.0 - ready smart green facility located in Sri City, Andhra Pradesh, India. It's an industrial zone with the latest infrastructure 75 km from the cosmopolitan city - Chennai, the facility is well connected by road, rail, air, and sea. In Sri City factory, skilled professionals and cutting - edge technology powered by digitisation, robotics, automation, and the latest CNC machines work in tandem to produce vapour absorption chillers, heat pumps, closed loop cooling tower, adiabatic cooling tower, refrigeration units with zero - defect. The ISO 9001 certified and Lloyd's accredited Quality Management System ensure compliance with international standards specific to each country and complies with the latest protocols.



**4.0  
INDUSTRY**

Industry 4.0 ready smart manufacturing unit



Real-time updates on production status



**IGBC**  
Platinum-certified green facility and water positive accreditation



Strategically located for hassle-free shipping



Fully automated, fool-proof processes



Inclusive workforce



## Multi Energy to Multi Utility

### Live energy

Steam: 0 bar(g) - 25 bar(g)  
Hot water : 60°C - 250°C  
Thermic fluid: 150°C - 350°C  
Direct fuel: Lpg/ Natural gas/  
Diesel/ Propane & Biogas

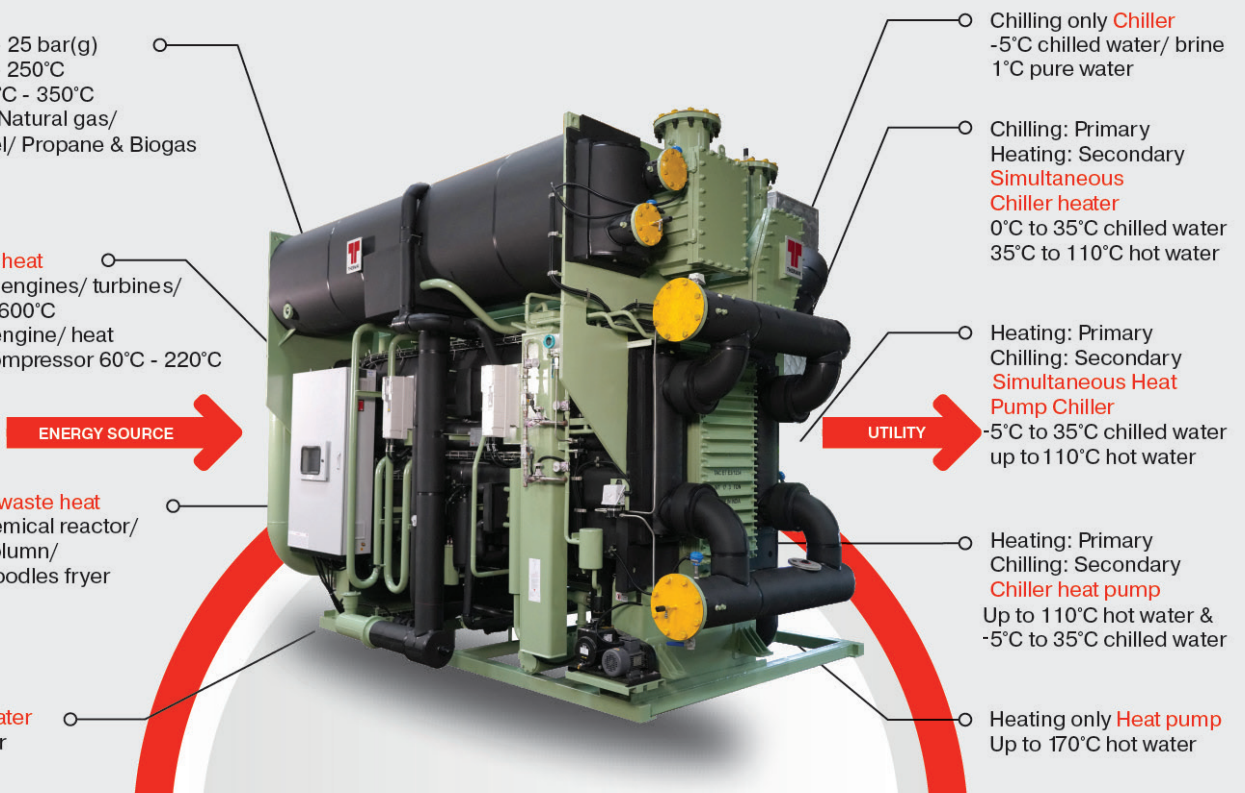
### Recovered waste heat

Flue gases: From engines/ turbines/  
furnaces 250°C - 600°C  
Hot water: From engine/ heat  
Recovery unit/ compressor 60°C - 220°C

### Process induced waste heat

Vapour: From chemical reactor/  
Polymerization column/  
Potato chips or noodles fryer

**Renewable hot water**  
Geothermal/ solar



Chilling only **Chiller**  
-5°C chilled water/ brine  
1°C pure water

Chilling: Primary  
Heating: Secondary  
**Simultaneous  
Chiller heater**  
0°C to 35°C chilled water  
35°C to 110°C hot water

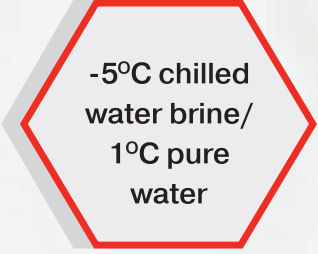
Heating: Primary  
Chilling: Secondary  
**Simultaneous Heat  
Pump Chiller**  
-5°C to 35°C chilled water  
up to 110°C hot water

Heating: Primary  
Chilling: Secondary  
**Chiller heat pump**  
Up to 110°C hot water &  
-5°C to 35°C chilled water

Heating only **Heat pump**  
Up to 170°C hot water

# Absorption Cooling

Absorption cooling is a thermally driven refrigeration process that uses heat instead of electricity to produce cooling. Unlike conventional vapour compression chillers that rely on mechanical compressors, absorption chillers use a heat source like steam, hot water, direct fuel firing, or waste heat to drive the cycle.



-5°C chilled  
water brine/  
1°C pure  
water

## Working Principle - Absorption chillers

Absorption chillers use heat energy instead of electricity to provide efficient cooling. The cycle begins with a heat source such as steam, hot water, exhaust, direct fuel firing, thermic fluid, multi energy - heating the generator, which separates the refrigerant (water) from the absorbent (typically lithium bromide). The refrigerant vapor then moves to the condenser, where it releases heat and condenses into a liquid. This liquid enters the evaporator, absorbing heat from the water to be chilled, creating the cooling effect. The vaporized refrigerant is reabsorbed into the solution in the absorber, completing the cycle, while the enriched solution returns to the generator to continue the process. This technology offers energy efficiency, environmental friendliness, and the ability to utilise variable heat sources.

## Advantages of Absorption Chillers

**Electricity Savings Up to 90%:** Absorption chillers can achieve higher energy efficiency compared to traditional mechanical chillers, especially in applications where waste heat or steam is readily available. This makes them suitable for co - generation or waste heat recovery systems.

**Environmentally Friendly:** They use water as the refrigerant, which is Zero ODP and Low GWP, environmentally benign compared to synthetic refrigerants that contribute to ozone depletion or global warming.

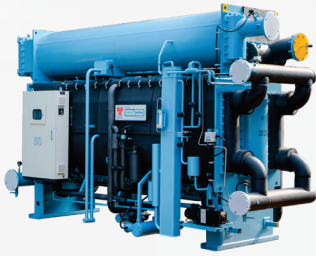
**Flexibility in Heat Sources:** They can utilise a variety of heat sources, including waste heat from industrial processes such as steam, vapour, thermic fluid, direct fuel firing, hot water, exhaust gases, multi energy, solar thermal energy, or low - grade biomass, enhancing their versatility.

**Long Lifespan and Reliability:** Absorption chillers are known for their robustness and longevity, requiring less maintenance compared to mechanical chillers. Absorption chillers operate quietly because of non - moving parts

**Scalability:** They are available in a wide range of capacities, making them suitable for both small - scale and large - scale applications. Capacity ranges from 50 TR - 3000 TR

Absorption chillers represent a sustainable and efficient alternative to conventional refrigeration technology. Their ability to harness waste heat and use environmentally friendly refrigerants positions them as a valuable solution in the quest for energy efficiency and reduced environmental impact across various sectors.

# Absorption Cooling Solutions - Standard Product Range



## Single Effect Steam Driven Absorption Chiller (S1)

**Heat Source:** Low pressure steam  
**Pressure:** 0.5 bar(g) - 3.5 bar(g)  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.8  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/ Comfort cooling



## Double Effect Steam Driven Absorption Chiller (S2)

**Heat Source:** Steam  
**Pressure:** 3 bar(g) - 10.5 bar(g)  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.51  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/ Comfort cooling



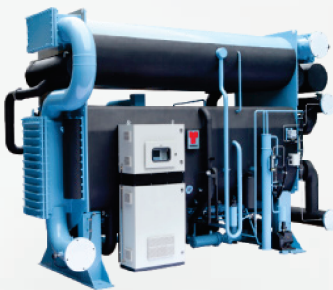
## Triple Effect Steam Driven Absorption Chiller (S3)

**Heat Source:** Steam  
**Pressure:** 16 bar(g) - 25 bar(g)  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.8  
**Capacity:** 200 - 900 TR  
**Application:** Process cooling/ Comfort cooling



## Triple Effect Thermic Fluid Driven Absorption Chiller

**Heat Source:** Thermic fluid  
**Temperature:** 250°C to 350°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.8  
**Capacity:** 200 - 1000 TR  
**Application:** Process cooling/ Comfort cooling



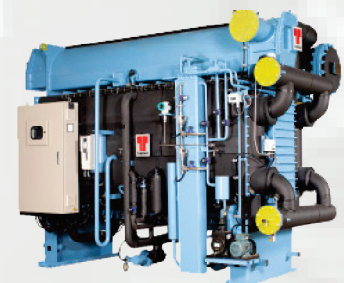
## Ultra Low Pressure Vapour Driven Absorption Chiller (S5)

**Heat Source:** Ultra low pressure steam  
**Pressure:** 0 bar(g) - 0.5 bar(g)  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.75 to 0.8  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/Comfort cooling



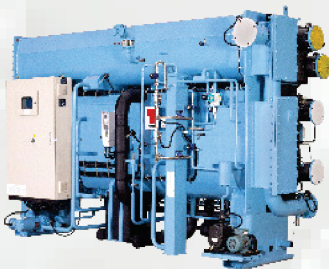
## Single Effect Hot Water Absorption Chiller (H1)

**Heat Source:** High temperature hot water  
**Temperature:** 110°C to 150°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.8  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/Comfort cooling



## Double Effect Hot Water Driven Absorption Chiller (H2)

**Heat Source:** High temperature hot water  
**Temperature:** 140°C to 180°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.51  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/Comfort cooling



## Low Temperature Hot Water Driven Absorption Chiller (L1)

**Heat Source:** Low temperature hot water  
**Temperature:** 75°C to 120°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.78  
**Capacity:** 25 - 245 TR  
**Application:** Process cooling/Comfort cooling



## Low Temperature Hot Water Driven Absorption Chiller (L5)

**Heat Source:** Low temperature hot water  
**Temperature:** 75°C to 120°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.8  
**Capacity:** 150 - 1900 TR  
**Application:** Process cooling/Comfort cooling



## Ultra Low Temperature Hot Water Driven Absorption Chiller (LH)

**Heat Source:** Ultra low temperature hot water  
**Temperature:** 60°C to 80°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.38 - 0.4  
**Capacity:** 60 - 650 TR  
**Application:** Process cooling/Comfort cooling



### Direct Fired Absorption Chiller (G2)

**Heat Source:** Fuels such as Natural Gas/Diesel/LPG/ Propane/Biogas  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.3 - 1.51  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling/ Comfort cooling



### Exhaust Fired Absorption Chiller (E2)

**Heat Source:** Exhaust flue gas  
**Temperature:** 250°C to 600°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.1 - 1.53  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling / Comfort cooling



### Double Effect Thermic Fluid Driven Absorption Chiller (T2)

**Heat Source:** High temperature thermic fluid  
**Temperature:** 220°C to 350°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.51  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling / Comfort cooling



### Exhaust Fired Absorption Chiller (E7)

**Heat Source:** Exhaust gas with jacket water / Exhaust gas  
**Temperature:** Exhaust gas - 250°C to 600°C; Hot water - 80°C to 120°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.1  
**Capacity:** 50 - 3000 TR  
**Application:** Process cooling / Comfort cooling



### Multi Energy Absorption Chiller

**Heat Source:** Engine exhaust gas with jacket water/ steam with low temperature hot water/ high pressure and low pressure steam/ steam with direct fired backup / exhaust with direct fired backup/ combination of above 2 heat sources  
**Chilled water output:** -5°C to 35°C  
**COP:** 0.8 to 1.5  
**Capacity:** 50 - 3000 TR  
**Application:** Comfort Cooling / Process cooling / Product Cooling



### Hybrid Chiller

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD  
**Pressure / Temperature:** Steam - 6 bar(g) to 10 bar(g); Hot water - 140 °C to 200 °C; Exhaust gas - 200 °C to 600 °C  
**Chilled water output:** -40 °C to -5 °C  
**Capacity:** 30 to 500 TR  
**Application:** Cold room / refrigeration / Process cooling  
**Feature:** 50% reduction in power consumption\*



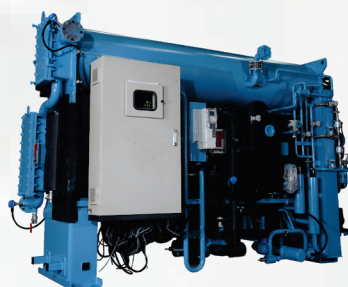
### High Efficiency Chiller Heater

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD  
**Output:** Chilled water -5°C to 35°C | Hot water - 35°C to 95°C  
**Capacity:** 50 to 3500 TR (cooling) | 100 to 9250 kW (heating)  
**Modes of operation:** Simultaneous cooling or heating  
**Application:** Simultaneous cooling and heating for HVAC and process cooling  
**Feature:** 23% reduction in power consumption\*



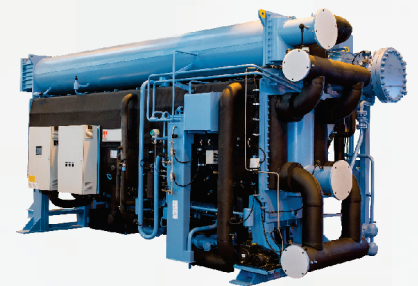
### One Degree Chiller

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD  
**Pressure / Temperature:** Steam - 6 bar(g) to 10 bar(g); Hot water - 140°C to 200°C; Exhaust gas - 200°C to 600°C; Thermic fluid - 220 °C to 350°C  
**Chilled water output:** 1°C to 3.5°C  
**COP:** 0.5 for single effect; 1.1 for double effect  
**Capacity:** 50 - 3000 TR  
**Application:** Chilled water for the Dairy, Brewery, and Food industries



### Sub Zero Chiller

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD  
**Pressure / Temperature:** Steam - 6 bar(g) to 10 bar(g); Hot water - 140°C to 200°C; Exhaust gas - 200°C to 600°C; Thermic fluid - 220°C to 350°C  
**Chilled water output:** Up to -5°C  
**COP:** 0.55 for single effect; 1.1 for double effect  
**Capacity:** 50 - 3000 TR  
**Application:** Cold room / refrigeration / Process cooling



### Triple Effect Hot Water Driven Absorption Chiller

**Heat Source:** High temperature hot water from the process  
**Temperature:** 200°C to 250°C  
**Chilled water output:** -5°C to 35°C  
**COP:** 1.8  
**Capacity:** 200-1000 TR  
**Application:** Process cooling/Comfort cooling

# Absorption Heating

Absorption heating is a thermally driven process that utilises low - grade heat to generate useful heating, such as hot water or steam. Instead of relying on conventional fossil - fuel - based systems, it harnesses available thermal energy to deliver heating in a more sustainable and efficient way.

## Working Principle - Heat Pumps

Absorption heat pumps use low - grade heat to provide efficient heating and hot water. The system works by circulating a refrigerant - absorbent pair - water and lithium bromide - through a generator, condenser, evaporator, and absorber. Heat input at the generator separates the refrigerant from the absorbent, and the refrigerant vapor is condensed to release heat. In the evaporator, it absorbs low - temperature heat from the environment or process streams. The vapor is then reabsorbed into the solution, completing the cycle. This enables energy - efficient, sustainable heating using waste heat or renewable sources.

## Advantages of Absorption Heat Pumps

- They can operate with low - grade heat, making them more energy - efficient in certain applications.
- They can use renewable energy sources such as solar thermal energy effectively.
- They do not require electricity to operate the main cooling/heating cycle.
- Hot water generation up to 110°C
- Reduction in operating costs by 40%
- Reduction in carbon emissions by 90%

Overall, absorption heat pumps offer a sustainable alternative in specific scenarios where heat sources are abundant, providing heating and cooling solutions with lower environmental impact compared to traditional methods.

# Absorption Heating Solutions - Standard Product Range



### Heat Pump Type 1

**Heat Source:** Steam/ hot water/ exhaust gas/ fuels such as CNG, LPG, propane, etc.

**Pressure / Temperature:** Steam - 4 bar(g) to 10 bar(g); Hot water : - 140°C to 200°C; Exhaust gas - 200°C to 600°C

**Hot water output:** Up to 110°C

**COP:** 1.8

**Capacity:** 0.5 - 40 MW

**Application:** District hot water generation / Hot water for process



### Heat Pump Type 2

**Heat Source:** Low temperature hot water from process

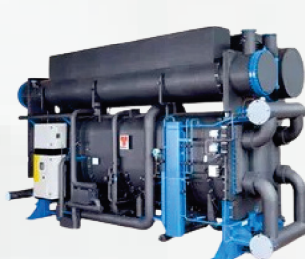
**Temperature:** 75°C to 130°C

**Hot water output:** Up to 170°C

**COP:** 0.47

**Capacity:** 0.5 - 15 MW

**Application:** High temperature hot water for process / Steam generation



### Chiller Heat Pump

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD

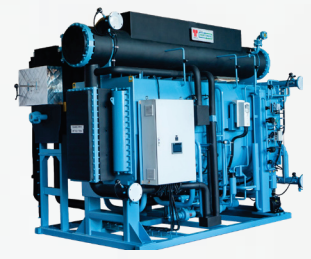
**Pressure / Temperature:** Steam - 4 bar(g) to 10 bar(g); Hot water - 140°C to 200°C; Exhaust gas - 200°C to 600°C ; Direct fired - 200°C to 600°C

**Output:** Hot water up to 110°C |

**Chilled water:** -5°C to 35°C

**Capacity:** 40-500 TR (cooling) | 0.5 - 5 MW (heating)

**Application:** Hot water for district hot water generation / hot water for process; Chilled water for process cooling / comfort cooling



### Heat Pump Chiller

**Heat Source:** Steam/ Hot water/ Thermic fluid / Exhaust gas/ Fuels such as CNG, LPG, HSD

**Output:** Hot water up to 110°C |

**Chilled water:** -5°C to 35°C

**Capacity:** 40 -300 TR (cooling) | 0.5 - 5 MW (heating)

**Modes of operation:** Cooling, Heating and Simultaneous

**Application:** Hot water for district hot water generation / hot water for process; Chilled water for process cooling / comfort cooling

**Feature:** 32% overall energy savings\*

# SustainX

SustainX by Thermax Cooling Division is dedicated to supporting the global transition towards sustainability. The 'X' in SustainX reflects the endless opportunities we seek to enhance energy efficiency and minimise environmental impact. With a focus on practical innovation, we provide sustainable cooling and heating solutions designed to address present challenges while helping to build a more sustainable future.

Our focus extends beyond mere efficiency, we are dedicated to embracing eco - friendly refrigerants and sustainable design principles, ensuring our products adhere to the highest global environmental standards to combat climate change.

But SustainX is more than just a provider of efficient systems, it's a catalyst for building a sustainable ecosystem where businesses flourish responsibly. Our vision transcends meeting present-day needs, it's about securing a sustainable future for generations to come.

With a diverse product range - from Adiabatic Cooling Tower to Hybrid Heat Pumps - we exemplify our commitment to delivering innovative, eco - conscious solutions to customers across various sectors. Each of our products is meticulously designed to directly address the sustainability goals of our customers, offering substantial energy and water savings.

## Heating Solutions

Hybrid Heat Pump



Air Source Electrical Heat Pump



Water Source Electrical Heat Pump



## Wet Solutions

Closed Loop Cooling Tower



Hybrid Cooler



Adiabatic Cooling Tower



Evaporative Condenser



## Dry Solutions

Air Cooled Heat Exchanger



Dry Cooler



## Refrigeration System

Industrial Refrigeration Systems



# Process Heating Solutions

Process Heating Solutions Electrical and hybrid heat pumps provide sustainable alternatives to conventional fossil - fuel - based heating. By harnessing electricity, these systems deliver hot water at 140°C with high efficiency and near - zero emissions. They enable industries to cut energy costs, reduce carbon footprint, and achieve long - term decarbonisation goals.

## Electrical Heat Pump

### Working Principle

A high - efficiency system that moves heat instead of generating it. Works on a reverse refrigeration cycle - extracts heat from a cooler source (air, water, or both) and releases it into a warmer area. Capable of both heating and cooling, making it versatile for seasonal or process - based applications. Known for low operating costs, zero direct emissions.



Hot Water  
up to  
140°C

### Advantages:

- High COP (Coefficient of Performance)
- Low operating cost and no direct emissions
- Dual-mode: heating + cooling
- Compact and flexible installation
- Simultaneous chilled water generation up to 60%
- **Types** - Air Source, Water Source, Dual Source

## Hybrid Heat Pump

### Working Principle

Combines absorption heat pump technology (which uses thermal energy like steam or hot water) with electric - driven components. Offers dual - source flexibility, switching between electric and thermal inputs based on energy availability or cost - efficiency. Ideal for facilities that have waste heat or require heating and cooling at different times. Enhances system resilience and reduces dependency on a single energy source.



Hot Water  
up to  
140°C

### Advantages:

- Flexibility between thermal and electric energy
- Reduces peak load on electrical grid
- Higher operational efficiency
- Suitable for industries with variable heat sources
- Simultaneous chilled water generation up to -5°C and steam up to 2.5 bar.g


# Wet Cooling Solutions

Wet Cooling Solutions Our portfolio of wet cooling solutions - including evaporative condensers, hybrid coolers, closed loop cooling towers, and adiabatic cooling towers - offers efficient and reliable heat rejection for diverse industrial applications. Designed to optimise energy and water use, these systems deliver consistent cooling performance while supporting sustainability, operational efficiency, and reduced environmental impact.

## Closed Loop Cooling Tower

### Working Principle

Designed to protect the process fluid from external contamination by circulating it through a sealed coil. Ambient air and recirculating water pass over the coil, and heat is removed via evaporation. The fluid which cooled is recirculated back into the process. Ideal for systems with sensitive equipment, high water quality requirements, or where direct water contact is not preferred. Offers operational reliability with elimination of scaling and fouling risks



Upto  
30% water  
savings

## Types:

Mixed Flow, Counter Flow

## Advantages:

- Clean and contamination-free process fluid
- Elimination of scaling and fouling
- Lower water treatment costs
- Suitable for dusty, corrosive environments
- High reliability with low maintenance

## Hybrid Cooler

### Working Principle

Advanced cooling system that integrates dry cooling, wet cooling, and adiabatic cooling. Operates dry during most of the year, conserving water. In hot weather, it shifts to wet operation (with adiabatic pre-cooling), enhancing cooling efficiency. Maintains a sealed process fluid loop to avoid contamination. Perfect for industries needing year-round performance, water conservation, and low operating costs & lower foot print.



\*When compared to open loop cooling tower  
^When compared to adiabatic cooling tower

## Advantages:

- Water - saving operation with performance flexibility
- Combines benefits of dry & wet systems
- Lower lifecycle cost
- Elimination of scaling, fouling and legionella formation
- Clean closed - loop fluid system
- High efficiency in peak load conditions
- High efficiency in hot ambient conditions

## Adiabatic Cooling Tower

### Working Principle

Primarily functions as a dry cooler under standard ambient conditions. During high ambient peaks, water is sprayed over adiabatic pads, cooling the incoming air before it contacts the heat exchange coil. This pre-cooled air improves thermal performance without excessive water consumption. Combines the efficiency of wet cooling with the sustainability of dry operation - suited for regions with water scarcity or high temperatures.



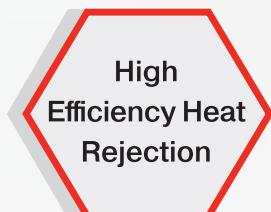
## Advantages:

- Saves up to 95% water vs. conventional towers
- Dry mode operation during cooler months
- Lower drift and blowdown losses
- Reduced scaling and microbial growth
- Ideal for water - scarce regions

## Evaporative Condenser

### Working Principle

A compact solution that integrates heat rejection and condensing functions. Refrigerant vapor flows through a coil where water is sprayed over the surface. Simultaneously, a fan pulls ambient air through the unit. As water evaporates, it draws heat from the refrigerant, causing it to condense. This dual-mode (air + evaporative) cooling ensures lower condensing temperatures, reduced compressor workload, and energy savings.



## Advantages:

- Compact footprint (condenser + cooling in one)
- Lower condensing temperatures = energy savings
- Reduced refrigerant charge
- Ideal for ammonia & synthetic refrigerants

# Refrigeration Solutions

Our industrial refrigeration systems deliver reliable and energy - efficient cooling for a wide range of process and storage applications. Designed with advanced technologies, they ensure precise temperature control, operational efficiency, and long - term sustainability, helping industries optimise performance while reducing environmental impact.

## Industrial Refrigeration Unit

### Working Principle

Engineered to maintain precise temperature control across a range of industrial applications. Works on a vapor compression cycle using natural refrigerants like ammonia, propane & CO<sub>2</sub> & synthetic refrigerants like freon (HFC,HFO). Absorbs process heat at the evaporator, compresses the refrigerant, and rejects heat through a condenser. Available in single - or multi - stage configurations, suitable for industries such as cold storage, pharmaceuticals, and food & beverage where uninterrupted cooling is critical.

Precise and  
Reliable  
Cooling

### Advantages:

- Reliable & precise temperature control
- Scalable for small to large plants
- Compatible with ammonia and Freon
- Energy - efficient systems with automation options

# Dry Cooling Solutions

Our dry cooling portfolio, including air-cooled heat exchangers and dry coolers, offers efficient heat rejection without water consumption. These systems are ideal for industries aiming to conserve water while ensuring reliable performance, lower operating costs, and sustainable operations under varying climatic conditions.

## Air Cooled Heat Exchanger

### Working Principle

ACHE transfers heat from hot process fluids (oil, gas, etc.) directly to ambient air using finned tubes and axial fans. The hot fluid circulates through tube bundles while ambient air is blown across the fins, removing heat by forced convection. It's commonly used in process industries for high - temperature applications.

Water  
Savings  
through  
Effective Dry  
Cooling

### Advantages:

- No water consumption
- Suitable for high - temperature, high-pressure fluids
- Lower operating and maintenance costs
- Ideal for remote or water - scarce locations
- Environmentally friendly - no plume or water discharge

## Dry Cooler

### Working Principle

A dry cooler removes heat from a closed - loop water or glycol - water circuit by using ambient air. Fluid flows through finned coils while fans blow outside air across them, lowering fluid temperature through sensible heat transfer. It's often used in HVAC, data centers, and industrial cooling.

Water  
Free  
Cooling

### Advantages:

- Closed - loop system prevents contamination
- No water usage or evaporation losses
- Compact, modular, and easy to install
- Low noise operation available
- Efficient performance in cooler climates (free cooling)

# SustainX - Product Range



## Hybrid Heat Pump

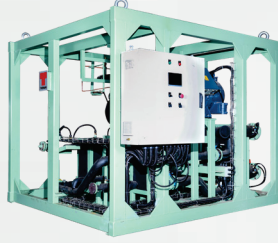
**Heating Capacity:** From 0.4 MW & above

**Hot Water Output:** Up to 140°C

**Water Savings:** Up to 30%

**Direct Fuels Savings:** Up to 40%

Simultaneous Cooling generation capacity up to 30%



## Water Source Electrical Heat Pump

**Heating Capacity:** 0.2 MW to 3 MW per single unit

**Hot Water Output:** Up to 140°C

**Energy Savings:** Up to 60%

**Compressor Type:** Screw

**Refrigerant:** R134a / R1234ze



## Air Source Electrical Heat Pump

**Capacity:** 0.25 MW - 1.5 MW

**Hot Water Output:** Up to 90°C

**Compressor Type:** Screw

**Refrigerant:** R134a / R1234ze



## Closed Loop Cooling Tower

**Capacity:** 10 CMH to 400 CMH

(In a Single Unit)

**Types:** Mixed and Counter flow, Hybrid

**Temperature Range:** Inlet water up to 75°C

**Approach:** Up to 2.5°C

**Casing:** AZ 150 / AL-ZN-MG / SS 304

**Tubes:** SS 304L / SS 316L

**Fans:** Std Axial Fan & Motor / EC Fans



## Hybrid Cooler

**Capacity:** 20 CMH onwards

**Temperature Range:** Inlet water up to 90°C

**Approach:** Up to 2.3°C

**Casing:** AZ 150 / AL-ZN-MG / SS 304

**Tubes:** SS 304L / SS 316L

**Dry Finned Coil:** Copper tubes with aluminium fins

**Fans:** Low sound high efficiency axial fans / EC fans



## Adiabatic Cooling Tower

**Capacity:** 100 kW to 1000 kW in (single unit)

**Temperature Range:** Inlet water up to 55°C

**Approach:** Up to 4°C

**Tubes:** SS 304

**Fins:** Plain / Corrugated

**Fans:** Std axial fan & motors / EC fans



## Refrigeration System

**Capacity:** 25 TR to 1000 TR (Single Unit)

**Temperature Range:** (-) 45°C to 10°C

**COP:** 0.8 to 5 (depending on the temperature lift between suction & discharge)

**Refrigerant:** Medium-ultra low GWP and zero ODP, Environment friendly refrigerant only (R134a / R404a / R717)



## Evaporative Condenser

**Capacity:** 30 TR to 800 TR (Single Unit)

**Temperature Range:** Up to 45°C Condensing

**Casing:** AZ 150 / AL-ZN-MG / SS 304

**Tubes:** SS 304L / SS 316L

**Fans:** Standard axial fan & motor / EC fans



## Dry Cooler / Air Cooled Heat Exchanger

**Capacity:** 100 kW onwards

**Temperature Range:** Inlet fluid 150°C to 200°C / Outlet fluid 5°C to 15°C

**Approach:** Up to 7°C

**Fins:** Aluminium / Copper

**Tubes:** Carbon steel / SS

# Industries Catered



Chemicals



Food Processing



Dairy



Cold Storage



Brewery/Distillery



Beverages



Pharmaceuticals



Refinery and Petrochemicals



Textiles



Steel



Automobiles



Data Center



Paper



Packaging



Construction



Hospitality



Infrastructure



Fertilizer



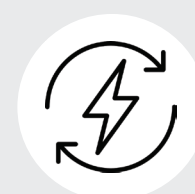
Wood



Rubber



Glass



Power

# Applications

## Refinery & Petrochemicals

- Reactor cooling
- Distillation column heating/ cooling
- Condensate cooling
- Compressor cooling
- Heat recovery from process streams
- Storage tank temperature control
- Panel room air conditioning

## Textiles

- Dye bath temperature control
- Yarn conditioning
- Fabric drying
- Air compressor cooling
- Loom machine cooling
- Water heating for washing

## Breweries & Distilleries

- Wort cooling
- Fermentation tank cooling
- Condenser heat rejection
- Column reboiler heating
- Spirit storage room cooling

## Metals

- Furnace cooling
- Billet preheating
- Cooling of rolling mills
- Heat treatment line heating
- Hydraulic oil cooling
- Die casting machine cooling

## Food Processing

- Pasteurization heating
- Fermenter cooling
- Cold storage chilling
- CIP water heating
- Brine chilling
- Meat processing cooling

## Agro-Based

- Crop drying
- Grain cooling
- Fruit ripening chamber cooling
- Milk chilling
- Packhouse temperature control
- Heating for greenhouse or dehydration

## Chemicals

- Reactor cooling
- Crystallizer chilling
- Solvent recovery heating
- Jacketed vessel temperature control
- Acid/alkali neutralization heat management

## Data Centres

- Precision cooling for server rooms
- Heat recovery from IT loads
- Chilled water supply for CRAC units
- Backup cooling for UPS and electrical panels

## Fertilizers

- Ammonia reactor cooling
- Granulator heating
- Process air preheating
- Heat recovery from exothermic reactions
- Scrubber cooling

## Pharma

- Fermenter cooling
- Cleanroom air conditioning
- HVAC heating/cooling
- Distillation column heating/ cooling
- Product drying
- Tablet coating room cooling

## Automobiles

- Paint booth cooling
- Engine test bed cooling
- Air compressor cooling
- HVAC for assembly lines
- Component drying/heating
- Electroplating

## Beverages

- Fermentation tank cooling
- Pasteurization
- Bottle washing hot water
- CIP system heating
- Chiller for beverage storage
- Syrup cooling and pasteurisation

## Construction

- Concrete curing
- Equipment cooling
- Site cabin HVAC
- Batch plant process cooling
- Formwork heating

## Paper

- Dryer cylinder heating
- Paper machine cooling
- Press section temperature control
- Chilled water for humidification systems
- Calendar roll cooling

## Packaging

- Heat sealing
- Shrink tunnel heating
- Labeling machine cooling
- Cold room temperature control
- Injection molding cooling

## Global Technical Services

Service experts of Thermax Cooling and Heating solutions have ensured on - time installation and commissioning of chillers and heat pumps in various industries across 90+ countries leading to the extreme satisfaction of customers. Annual maintenance contracts tailor - made to suit the customer requirements enable us to maintain the health of the equipment at optimum levels. Service experts are

available on call throughout the world, be it regular service care, revamping, overhauling, all kinds of retrofits or hassle - free spare replacement. Customers worldwide also benefit from training sessions conducted by technical experts that ensure optimum equipment health and unhindered operations.

## Value Added Services



Global network of service professionals on call



Annual service and maintenance contracts



Solution analysis



Residual analysis

## Value Added Upgrades



Thermax EDGE Live Cool



Retrofits and revamping



Extended machine life



Thermax genuine spare parts

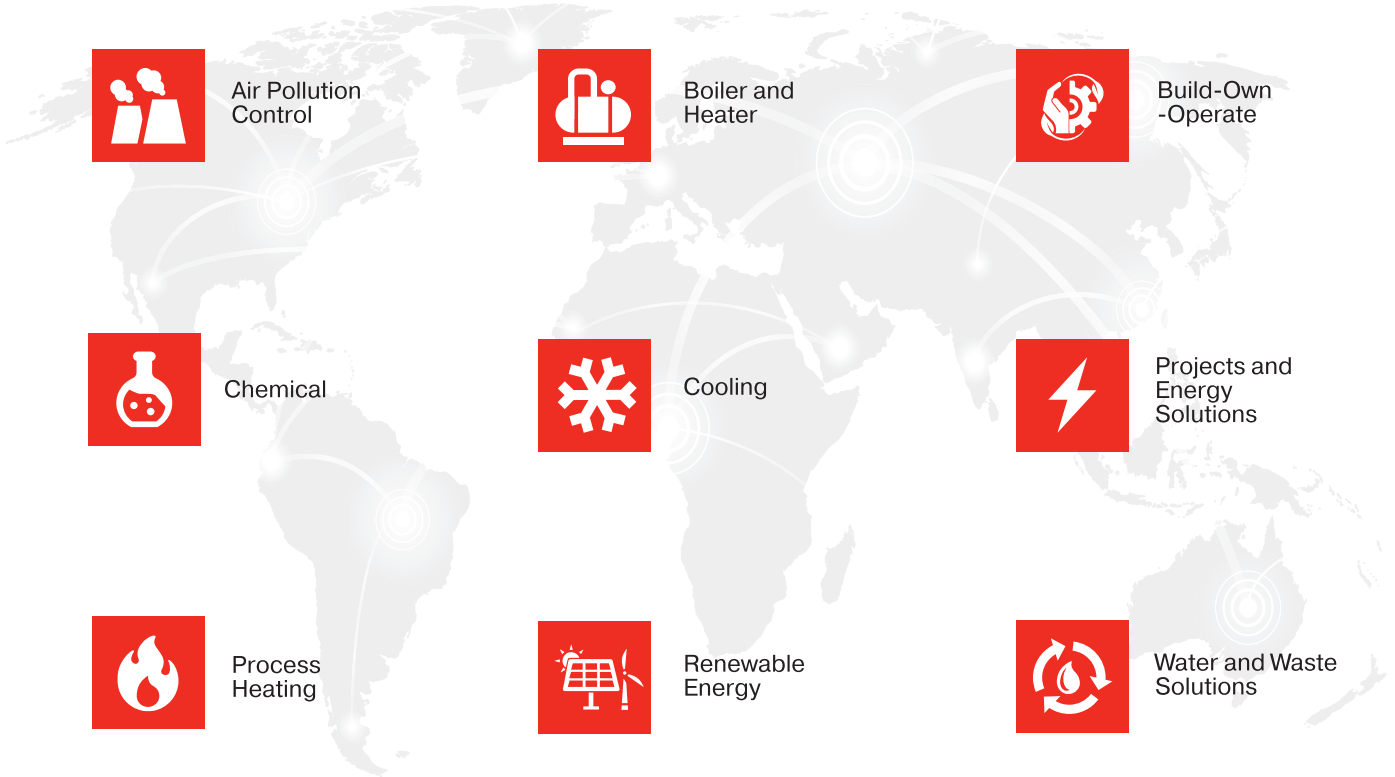
## Thermax Edge™ Live Cool

Thermax EDGE Live Cool is an enterprise asset performance enhancement solution powered by AI and ML. It ensures the well - being of your chillers by performing periodic remote monitoring, advanced trend analysis, data logging, diagnostic, etc., to enhance the productivity and profitability of operations. Our innovative solution connects all the installations across the globe to Thermax servers and makes asset management easier by offering alarm notifications, trend graphs, and reports to your inbox. It allows businesses

to monitor the real - time status of chillers anytime anywhere in the world.

Any issues with your chillers can be troubleshooted promptly by Thermax Service Engineers via online, keeping the machine performance intact all the time and eliminating the possibilities for any unplanned downtime. Our solution provides proactive, well - advanced asset monitoring for zero downtime and optimized operations.

Conserving Resources,  
Preserving the Future.



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The photographs used in the brochure are indicative and may not match the actual product.

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