

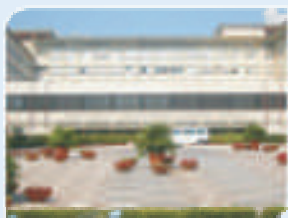
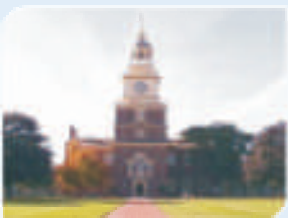
THERMAX

EcoChill *Net*

Fuel Driven
Absorption
Chiller - Heaters

The eco - friendly solution ...
for airconditioning and industrial cooling

THERMAX



THERMAX

Conserving Energy Preserving the Environment ■■■■

Thermax, a technology driven company has been in the core sectors of Energy, Environment and Exports for more than 25 years and has defined its business as Conserving energy and preserving the environment.

Thermax's manufacturing capabilities are confirmed by the fact that, over the years, Thermax has installed many machines in countries like USA, Germany, Spain, UK, Italy, Middle East, South East Asia with the product conforming to the respective country standards like ETL, CE, TUV, DNV, ASME, etc. Today, Thermax is a true multinational exporting Absorption Chillers to both developed and developing countries. Thermax Inc. headquartered in USA, Thermax Europe Ltd. in UK and Thermax do Brasil headquartered in Sao Paulo are fully owned subsidiaries of Thermax.

Thermax sales and after sales service is efficient, responsive and responsible. Our Engineers understand customer requirements, design the most optimal solutions and ensure the quality at every stage, to achieve customer delight. Thermax has a worldwide network of its Sales, Service & Distribution Network offices to fulfill the needs of its valuable customers.



Technology Leadership Our Core Competency ■■■■

We nurture innovation and encourage development at all levels which has contributed significantly in raising the performance and efficiency parameters of our Chillers. Dedicated Research and Development Group has achieved spectacular breakthroughs in absorption cooling technology. Our Cogenie series of Hot Water Absorption Chillers received the prestigious Energy Product of the year Award in UK.

Thermax engineered products have created many delighted customers in India and all over the world including developed markets like Europe and USA. Some of the most prestigious names in the world have chosen Thermax Absorption Chillers to meet their cooling requirements which include Mercedes - Germany, Bosch - Germany, Astra Zeneca - UK, Henry Ford Museum - USA, State University of New York, BBC - UK and the like.





Features & Benefits ■■■■

The **EcoChill[®]** series represents a major advance in Absorption Chiller-Heater performance. The earlier generation of Absorption Chiller-Heater offered significant advantages over conventional compression machines, and gained a substantial presence globally. These new generation Absorption Chiller-Heaters offer even greater economies, eco-friendliness and various additional benefits further enriching and expanding their usage.



C h i l l e r

~ Capacity

EcoChill[®] are available in the range of 75 - 1150 Nominal USRT (265 kW - 4025 kW), and can achieve chilled water temperature upto 3.5 °C (38.3° F).

~ Multi - fuel Capability

EcoChill[®] can use various type of liquid and gaseous fuels like Light Oil, SKO (Superior Kerosene Oil), Natural gas, CNG, LPG and other gaseous fuels.

~ Sturdy and Reliable Generator Design

EcoChill[®] have rugged generator, designed to handle gaseous fuels as well as light liquid fuels.

~ Monobloc Burners

EcoChill[®] use monobloc burners of Modulating type. Gas burners are provided with standard gas train.

~ Auto De-crystallisation

EcoChill[®] are provided with the unique auto de-crystallization circuit to eliminate crystallisation.

~ On-Line Purging

The factory mounted and tested purging unit consists of an electrical motor driven purge pump, storage tank, necessary piping and valves. Any non-condensable gas generated in the Chiller-Heater during operation, is purged continuously into the storage tank, thereby maintaining low vacuum in the shell.

~ Crossover Piping

Crossover pipe is factory installed avoiding the work at site or at riggers yard and hence maintaining high quality of work.



~ Gravity Feed System

EcoChill[®] use gravity feed, non-pressurised super-spraying system, for spraying refrigerant and absorbent. The use of nozzles is avoided as they have problems of clogging and wear & tear.

~ Side Exit Nozzles

The absorber, evaporator and condenser headers are provided with side nozzles for ease of maintenance and lower down-time. The absorber and condenser headers are hinged type, for easy access to the tube bundle and eliminates need for heavy lifting arrangements.

~ PLC based Control Panel

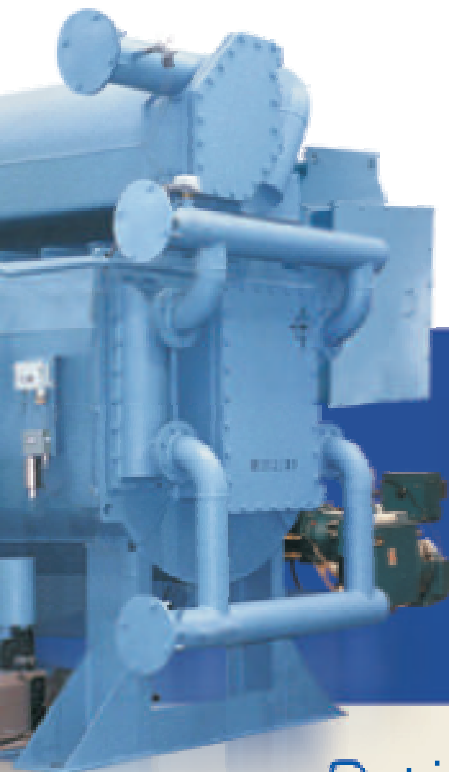
EcoChill[®] are provided with PLC based control panel with 4 line display, user friendly interface and data-logging system.

~ Isolation Valves for Pumps

Isolation valves provided on the pumps, facilitate on-line pump maintenance, without breaking the vacuum in the Thermax Absorption Chiller-Heater.

~ Corrosion Inhibitors

Thermax uses the new generation corrosion inhibitor, Lithium Molybdate, which is more effective than conventionally used Lithium Nitrate and Lithium Chromate.



H e a t e r

Optional Features & Benefits ■■■■

⦿ VFD Control for excellent Part Load Performance

During part load conditions, modulation of the absorbent pump by VFD control, allows optimum flow of the absorbent to the high temperature generator. This in turn optimises the input energy, resulting in superior part load performance.

⦿ Online standby Canned Motor Pumps

When specified, Thermax can offer on-line standby solution and refrigerant pumps.

⦿ On-line bearing monitoring

As a special option Thermax can provide a TRG meter for on-line bearing monitoring of the pumps. By continuously measuring the bearing clearance, through eddy currents, the TRG reading proactively lets the user know the condition of the bearing at any given instant.

⦿ Special tube material for Evaporator / Absorber / Condenser

The selection of tube material is done purely on the basis of the water quality available at the jobsite. Accordingly, Thermax can offer following special tube materials :

- CuNi (95:5) • CuNi (90:10) • CuNi (70:30)
- SS - 316 L • Titanium

⦿ Dual Firing Burners

For flexibility in use of use of fuel, Thermax can provide burners which can fire either on Gas or Oil.

⦿ Low NO_x Burner

As a special feature, Thermax can provide Low NO_x burner. Standard 90 ppm (can also provide 30 ppm and lower).

⦿ Multi - sectional Shipment Arrangement

For convenience of shipping and rigging, the Absorption Chiller-Heaters can be shipped in two or more sections depending upon the site requirements. This is particularly convenient for retrofit jobs.

⦿ Factory Performance Test

After assembly, Absorption Chiller-Heater can be individually tested for performance at the conditions specified by the customer.

During Performance Test, readings are taken for various parameters like (Testing is done on oil):

- Chilled water inlet / outlet temperatures
- Capacity
- Oil Consumption
- Cooling water inlet / outlet temperatures

Controls

→ Improved Reliability

Incorporates a state-of-the-art programmable logic controller, which incredibly enhances the flexibility and reliability of the machine.

→ Elaborate Diagnostic Facility

Information such as Chiller-Heater trip causing sensor error, hardware related faults, pump errors, etc. are recorded and displayed. These helps in faster and easier trouble shooting and routine maintenance.

→ Easier Operation and Maintenance

Unique display screen, feather touch key pad and the software constitute a user friendly operator interface. The operator can easily control functions with self explanatory messages displayed automatically on the screen. Any abnormality is communicated through an audio visual alarm making it easier to initiate necessary action.

→ Data Acquisition and Logging with Adjustable Sampling Time

→ Also available as optional feature



(Remote Access for Chillers)

Modem Connectivity

PC Connectivity

DCS / BAS / BMS Connectivity



Safeties

Antifreeze Protection

- L-cut refrigerant pump
- Antifreeze thermostat
- Chilled water flow switch
- Chilled water DP switch

Crystallisation Free

- HT Generator temperature cutout
- Cooling water low temperature cutout

Pump Cavitation Safety

- Absorbent pump level relay
- Refrigerant pump level relay

Alarm Cycle

- Dilution cycle alarm
- Total shutdown alarm

Motor Protection

- Absorbent pump overload relay
- Refrigerant pump overload relay
- Purge pump overload relay



World Class ■■■ Technology for World Class People

Our customer list spans most of the major industry verticals, each with its specific requirements and operating parameters.



Hotels

Sheraton Towers, Brazil
P T Bali Nirwana, Indonesia
Marriot, USA



Commercial Centers

BBC Studio, UK
Henry Ford Museum, USA
Bicycle Casino, USA
33rd Precinct NYPD, USA



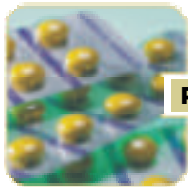
Educational Institutes

SUNY, Albany, USA
Bloomsberg University, USA
Roosevelt Magnet School, USA



Super Market

Mundial Super Market, Brazil
Prezuni Super Market, Brazil
Raleys Deptt. Stores, USA



Pharmaceuticals

Astra Zeneca, U.K.
Pfizer India Ltd.
Bayer, India
Jhonson & Jhonson, USA



Medical Centers

Royal Free Hospital, UK
VA Medical Center, USA
Gemilli Hospital, Italy



Refineries & petrochemicals

Exxon Mobil, Saudi Arabia
Saudi Formaldehyde and
Chemicals, Saudi Arabia
Reliance Industries Ltd., India
Gas Authority of India Ltd.



Chemicals

BASF, Mexico
Asian Paints, India
Nirma Ltd., India



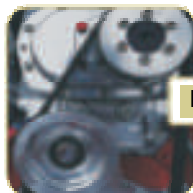
Electronics

Bosch, Germany
Moser Baer, India
Temic Heilbronn, Germany



Dairy & Confectionary

Nestle, Philippines
Cadbury, Nigeria
Chitale Dairy, India



Engineering

Daimler Chrysler, Germany
Larsen & Tubro, India
SKF Bearing, India
Medway Plastics, USA



Steel

United Gulf Steel, U.A.E.
Bhilai Steel Plant, India
Rourkela Steel Plant, India

Installations ■■■



Minds at work

In 2000, when the State University of New York (SUNY) at Albany was considering replacing its 25 year old single stage Absorber, we approached them with a very efficient solution. Our two stage high temperature hot water fired chillers enabled SUNY to now generate the same chilling capacity (1500 TR) with half the heat input. This means a straight saving of close to 50% in the cost of chilled water. And of course, the new generation Two stage Absorbers do not compromise on reliability, as compared to a single stage. 4 levels of safeties against crystallisation make the units ideal for 24 x 7 operating condition.



Silence Please... Hospital ahead

Reliability of equipment is always the first criteria, when it comes to selecting an equipment for Hospitals. Air - conditioning is mandatory and a continuous requirement in some parts of the hospital. In 2000, these factors played an important role in the decision making at the Vetrans Admin. (VA) medical facility at Rhode Island. Three 180 TR two stage steam Absorbers were installed for the critical application at this facility. Although the plant room is one level below ground, rigging was made easy by the conveniently sized modules in which the chillers were shipped.



Capacity Expansion without extra power demand

Torrent Pharma, a large integrated pharmaceutical company in India, after detailed evaluation of both electrical and vapour absorption technologies, adopted Thermax Absorption Chiller technology. 770 NTR (2700 kW) X 3 Nos. Prochill Absorption Chiller were installed considering the minimum power requirement and lesser operating cost of these machines. To maximise the benefits Thermax also introduced VFDs in the system. The power thus saved was utilised by Torrent towards capacity expansion.

Safety and Security

NYPD's 33rd Precinct : When the City of New York built this new Police Precinct uptown Manhattan, Two Gas fired Absorption Chillers, 150 TR each were a natural choice given the low summer time gas cost as compared to the high electric tariff. After seeing through two summers, NYPD is pleased with the saving in running cost and also the ease of maintenance and operation.



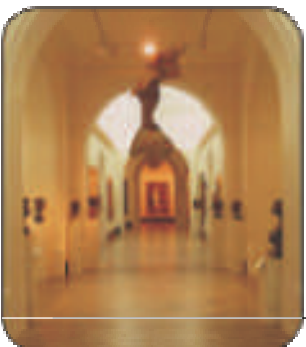
The Power of Knowledge

Roosevelt Magnet School, MA being very concerned about maintenance and down time of their chillers, selected two 180 TR Gas fired Absorption Chillers for their campus in 1999. In addition to easier and pre-planned maintenance schedules, they are also seeing the benefits in running cost reduction.



Beating the heat at BBC

When the world's premium television center, BBC, launched a survey to reduce its energy cost and the environmental degradation, they chose to go in for a Combined Heating, Power and Cooling System. After a thorough appraisal of product performance, compatibility with specifications, delivery time and back up services, BBC along with their consultants unanimously decided to award the contract to Thermax.



The stroke of a Genius

The cold and wet climate of London requires the heating of air to keep temperatures up. The National Portrait Gallery at Trafalgar Square found that their boilers could meet both heating and cooling demands. They opted for a 125 TR (440 kW) Thermax Absorption Chiller, which uses steam from the boilers and are also environment friendly as they are CFC free. Today, Thermax Chillers cool the most famous faces housed in the Gallery.




Customer Care ■■■

Thermax Absorption Cooling Division has a global network to ensure quick response to customers. The network consists of over 100 highly trained Absorption Chillers service personnel. With a cumulative service experience of close to 2000 Absorption Chillers operating for more than 10 years in over 40 countries, Thermax service personnel are equipped to deliver the right solution to the users. Thermax has developed specific service modules for different types of users depending on their usage pattern, conforming to our proactive approach.



For the benefit of its customers

Thermax offers various value added services like :

-  (Remote Access for Chillers)
- Preventive maintenance contract
- Operations & Manning (O & M)
- Localised customer training programs.

Global Quality Standards ■■■



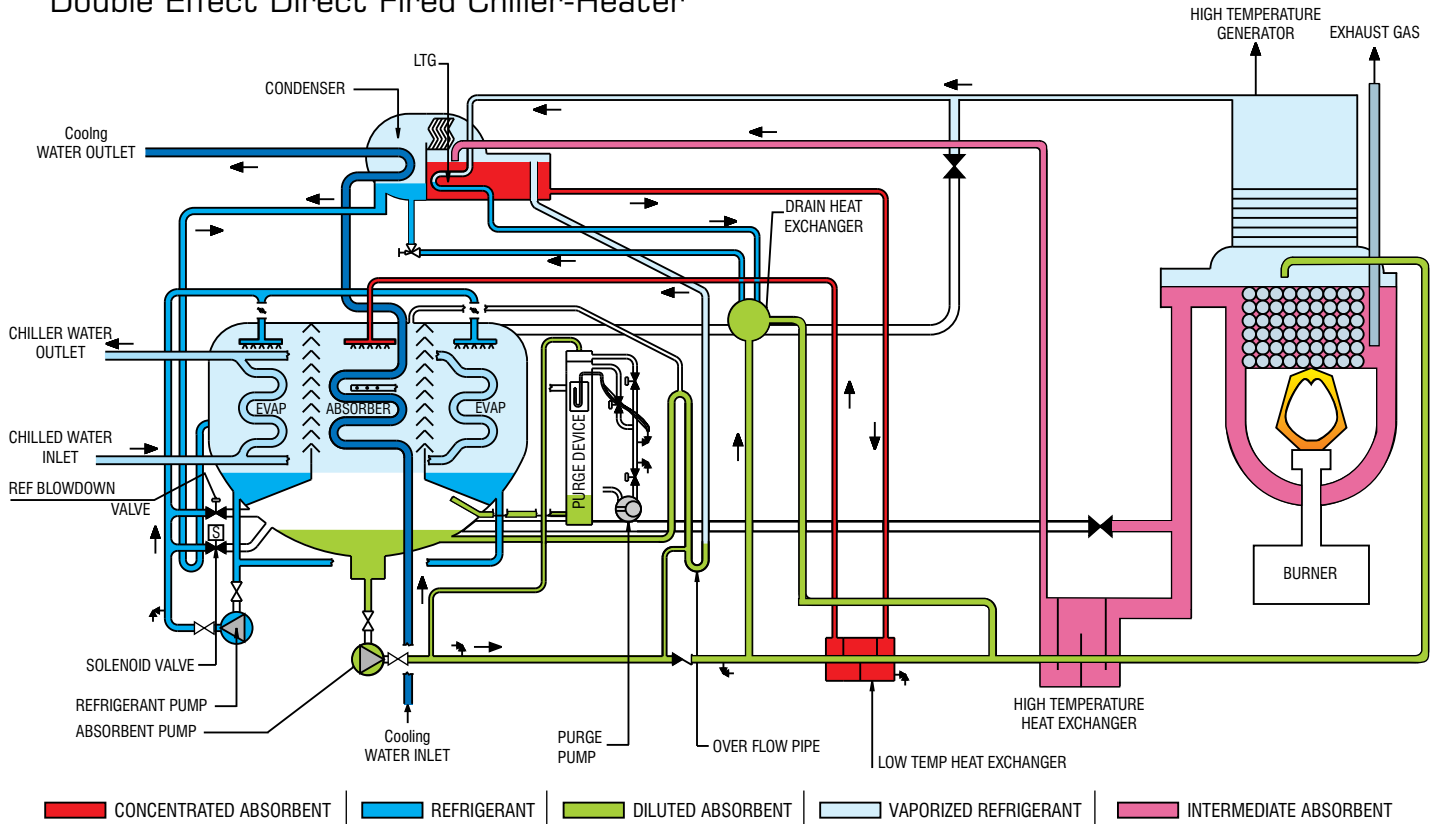
Thermax Absorption Chillers are exported to more than 40 countries worldwide. Our quality standards are confirmed by the fact that over the years we have installed many chillers in USA, Germany, UK, Spain, Italy, Middle East and South East Asia, with the equipments conforming to the respective country standards — ISO 9001:2000, ISO 14001, ETL, CE, PED, TUV, DNV, ASME to name a few. They even conform to the Kyoto Protocol and are in absolute tandem with Clean Development Mechanisms Code (CDM) which is becoming the order of times.

A critical parameter in our Quality assurance processes is testing procedures to ensure vacuum tightness. The tests include :

- Nitrogen test at $1.3 \text{ kg/cm}^2 \text{ g}$ pressure on the shell side.
- Helium Spray test.
- Helium Shroud test.

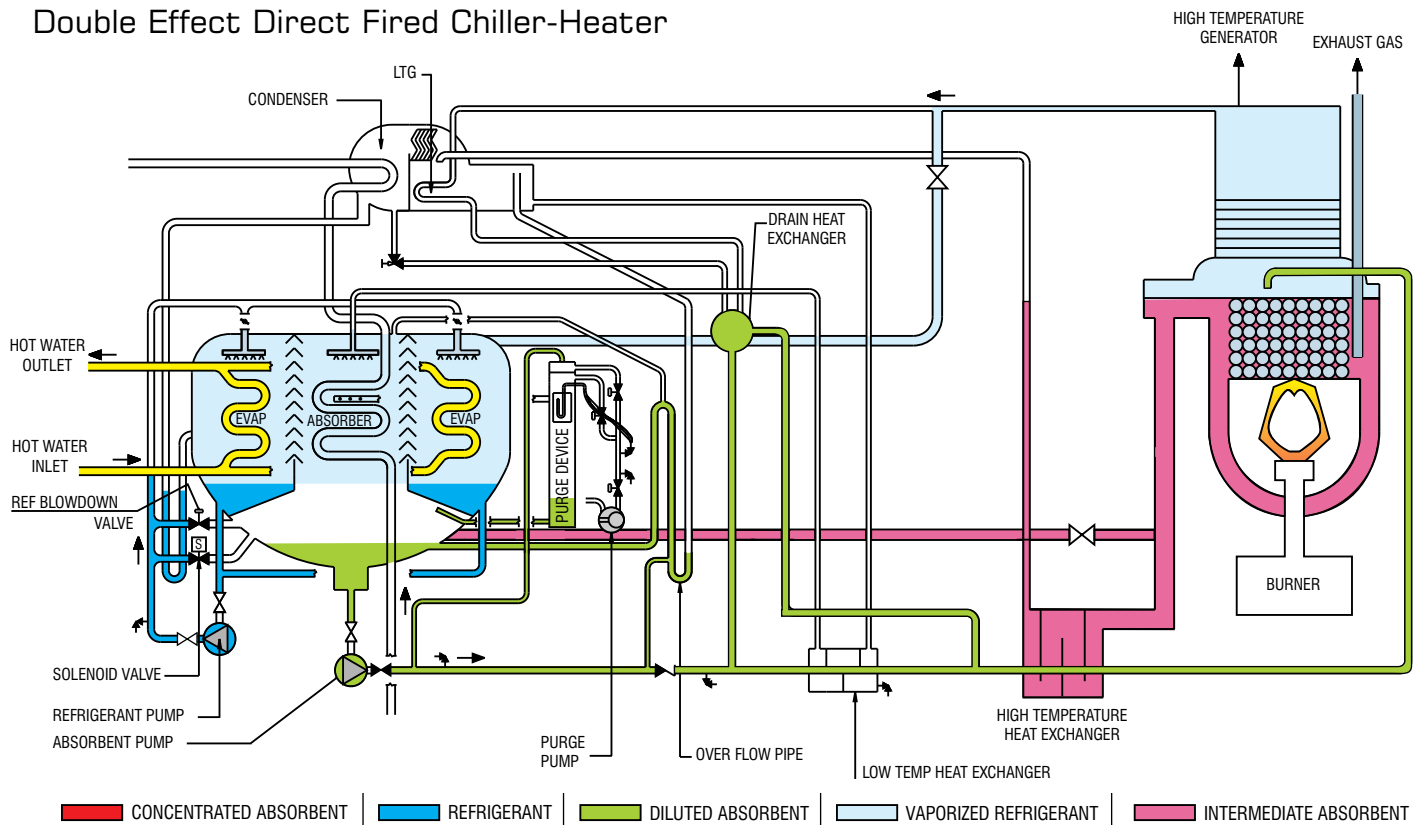
Cooling Cycle

Double Effect Direct Fired Chiller-Heater



Heating Cycle

Double Effect Direct Fired Chiller-Heater



Thermax world-wide network



THERMAX

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Distributor / Agent



Our Mission

" To continually add value to customer businesses through our integrated solutions and make high performance of all our activities."