

Cooling & Heating Division

ProChill™

B4k



STEAM DRIVEN

Vapor Absorption Chiller

Improving your business
is our business

Thermax offers services, products and solutions in the field of energy and environment to industrial and commercial segments around the world. Our business expertise covers heating, cooling, waste heat recovery, captive power, water treatment & recycling, air pollution control, waste management and performance chemicals.

THERMAX brings to customers enriched experience of industrial applications, and expertise through technological partnership and strategic alliance.

Operating from its Headquarters in Pune (Western India), THERMAX has built an international sales & service network spread over South East Asia, Middle East, Africa, Russia, UK and the US. It has a full-fledged ISO 9001 : 2000 and ISO 14000 accredited manufacturing setups.

Cooling & Heating Division - Cooling SBU

Cooling unit of C&H Division offers expert solutions in Process Chilling & air conditioning for industrial as well as commercial applications. We also provide customized solution as per the requirement.

Vapor Absorption technology from THERMAX is at work for clients in Pharma, Chemical, Fertilizer, Textile, Petrochemicals & Automobile industries as well as in Hotels, Cinema halls, Shopping Complexes & Office Buildings, round the globe.

THERMAX - Conserving Energy Preserving The Environment



THERMAX, a technology driven company has been in the core sectors of Energy & Environment for more than 4 decades and has defined its business objective as "Conserving energy and preserving the environment". THERMAX has established itself as Numero-Uno in its field by providing comprehensive solutions to industry.

THERMAX's manufacturing capabilities are confirmed by the fact that, over the years, THERMAX has installed numerous chillers in all major 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 doing business of vapour absorption chillers in all major countries of world. THERMAX Inc. in USA, THERMAX Europe Ltd. in UK, THERMAX do Brasil in Sao Paulo & THERMAX Hong Kong Ltd. are fully owned subsidiaries of THERMAX.

THERMAX believes in efficient and responsive services to our client and we exhibit it in our way of business, by giving most optimal and quality solutions, and 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, in THERMAX nurture innovation and encourage development at all levels of working, which has contributed significantly in raising the performance and efficiency parameters of our technology & products. Dedicated Research and Development Group has achieved spectacular breakthroughs in absorption cooling technology over the years. Our Cogenie series of Hot Water Absorption Chillers received the prestigious "Energy Product of the year" Award in the UK. Our Trigenie series of Multi energy driven absorption chillers bagged the first prize in the most innovative product design category in "Bry Air Awards for Excellence in HVAC & R 2006".

THERMAX engineered products have created many delighted customers in India and all over the world including 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 includes Mercedes - Germany, Bosch - Germany, Astra Zeneca - UK, Henry Ford Museum - USA, State University of New York, BBC - UK and the like.

THERMAX

ProChill™

B4k Series

■ A Milestone in Absorption Cooling Technology

THERMAX now introduces, the most efficient Steam Driven Vapor Absorption Chiller **ProChill™ B4k**. It is the latest range of chillers, which have many firsts to its credit, and has raised the technology benchmarks to higher levels.

What is new in **B4k** ?

Breaking 4 kg /Hr per TR Barrier

with the **ProChill™ B4k**, THERMAX offers specific steam consumption as low as 3.9 kg /hr per TR of cooling, which is upto 13% lower than other vapour absorption chiller suppliers.

**Substantial
Reduction In Steam**

Crystallization Free Smooth Operation*

ProChill™ B4k Chillers are uniquely designed to completely avoid crystallization during normal and even abnormal operation. The design allows use of **cooling water inlet to the chiller as low as 10 °C (50 °F)** which is a critical measure of crystallisation free design.

Breaking 4°C (39.2 °F) Barrier

with the **ProChill™ B4k**, THERMAX now offers outlet **temperature down to 3.5 °C (38.3 °F)**. Many end user industries where working temperature of less than 4 °C (39.2 °F) is critical, can now avail the benefits of Vapor Absorption Technology.

**B4k Gives Chilling
Below 4°C**

* Conditions Apply



Machine Features

The **ProChill B4k** series represents a major advance in Vapor Absorption Chiller performance. The earlier generation of Vapor Absorption Chiller offered significant advantages over conventional compression chillers, and gained a substantial market in India. Now, these new generation chillers offer even greater economies, eco-friendliness, and various additional features further enhancing and expanding its applications.

Chilled Water Outlet Temperature

B4k Chillers can achieve temperature down to 4°C (39.2°F), a very unique feature of this technology, can now be utilized in various new applications, which requires cooling below 4°C (39.2°F).

Wide Range of Capacities

The new **B4k** chiller are available in the range of
Single Effect : 92 NTR (323 kW) - 1495 NTR (5256 kW)
Double Effect : 111 NTR (390 kW) - 1685 NTR (5924 kW)

Steam Pressures

B4k Chillers can operate on the entire range of steam pressures.
Single Effect - 1 kg/cm² g (14.22 psig) - 3.5 kg/cm² g (49.78 psig)
Doble Effect - 4 kg/cm² g (56.9 psig) - 10 kg/cm² g (142.2 psig)

High Efficiency Through Less Steam

B4k Chillers incorporate the latest twin evaporator design technology and other innovations for higher efficiency resulting in below 4 kg/Hr/TR Specific Steam Consumption.

Part Load Performance

10 - 100% Automatic Step less Modulation

For loads ranging from 10- 100 % of designed capacity, this chiller is capable to maintain the uniform temperature of chilled water leaving the chiller.

Most Effective Corrosion Inhibitors

B4k Chillers use the new generation corrosion inhibitor, Lithium Molybdate, which is more effective than the conventionally used Lithium Nitrate and Lithium Chromate. Lithium Nitrate can generate Ammonium Nitrate (NH₄NO₃) which can be harmful to the chiller.



PLUS All The Regular Features of Vapour Absorption Technology

No CFC

Uses water as Refrigerant instead of ozone depleting Chloro Fluoro Carbons.

No Noise

No moving parts. No dynamic load. No vibration-Totally silent operation.



Negligible Maintenance

Negligible power - Only for small pumps

Modular design - Compact, on skid delivery

No Condensable- Consistent Performance

Any non-condensable gas generated in the chiller during operation, is purged continuously into the storage tank, thereby maintaining low vacuum in the shell and ensuring consistent performance.

PLC based User Friendly Control Panel

B4k is provided with state-of-the-art internationally accepted PLC based control panel with unique display, user friendly interface and data-logging system.

On- Line Concentration Measurement and Controls

B4k Chillers are provided with special concentration measurement and control system for enhanced reliability.

High Temperature Generator Tubes

B4k Chillers use SS 430 Ti Ferritic stainless steel tubes in high temperature generator, which is highly suited for high temperature environment.

Isolation Valves in Pumps for Minimum Downtime

Isolation valves, provided on the pumps, facilitate chiller mounted pump maintenance, without breaking the vacuum. This ensures minimum downtime.





■ Customized Features- Matching your Requirement

Online standby Canned Motor Pumps

Thermax can offer chiller Mounted standby absorbent and refrigerant pump

Special Material for Evaporator/Absorber/Condenser

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

Cupro - Nickel ,SS - 316 L, Titanium.

Multi-sectional Shipment Arrangements

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

Inverter Control

Auto Purging

■ Controls

Improved Reliability

B4k Incorporates a state-of-the-art programmable logic controller, which incredibly enhances the flexibility and reliability of the chiller.

Easier Operation maintenance

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

Elaborate Diagnostic facility

Information such as chiller trip cause, sensor errors, hardware related faults, pump errors, etc. Is recorded and displayed. This helps in faster and easier trouble shooting and routine maintenance.

Data Acquisition And Logging With Adjustable Sampling Time

Also Available as optional supply

Modem Connectivity

PC Connectivity

DCS / BAS / BMS Connectivity

■ Safeties

➤ Antifreeze Protection

L-cut refrigerant pump
Chilled water pump interlock
Chilled water flow switch
Chilled water DP switch

➤ Crystallization Protection

HT Generator temperature cutout
Cooling water low temperature cutout

➤ Pump Cavitation Free

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
Monash University, Australia
Roosevelt Magnet School, USA



Super Market

Mundial Super Market, Brazil
Prezunic Super Market, Brazil
Raleys Dept. Stores, USA



Pharmaceuticals

Astra Zeneca, U.K.
Pfizer India Ltd.
Boehringer, Germany
Johnson & Johnson, 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
Eka Chemicals, Brazil
Lyondell Equistar
Chemicals, USA



Electronics

Bosch, Germany
Moser Baer, India
Temic Heilbronn, Germany



Dairy & Confectionary

Nestle, Philippines
Cadbury, Nigeria
Chitale Dairy, India



Engineering

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



Steel

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



■ Diversified Solutions

Some case studies



Nestle, Philippines

Thermax's boiler division had sold a coffee waste fired boiler to the Nestle Coffee plant, Philippines. In lieu of the excess steam available with Nestle, Thermax's Absorption Cooling Division approached the customer for a chiller package coupled with the boiler, in order to utilize the steam for their process as well as comfort cooling.

Thermax Vapor Absorption Chiller required power consumption of only 11 KW significantly lower than 1160 KW of Ammonia chiller. It is expected to reduce the factory's power cost by Ph 1.5 Million monthly.

California Bank & Trust Building

California Bank & Trust Building was facing a dilemma of rising cost of electricity with respect to the maintaining and operating cost of the plant. Thermax approached the Bank with a simple solution of reducing the electricity consumption with their Absorption Chiller, which reduces the intake of electricity substantially, with its unique features. Thermax vapor absorption chillers helped the California bank to save USD 155,000/year.



Square Textiles, Bangladesh

Textile being Power intensive and with the ever increasing Power and Electricity crisis & fluctuations in Bangladesh, SQUARE had no other option but to generate their own power. They also had high cooling requirement.

Thermax Offered them the most efficient Hot Water Fired chiller (HWF) & Double Effect Steam Fired Chiller(DESF) on their 3 Caterpillar engines (1 MW x 3) with a Exhaust Gas Boiler(EGB). By the use of Vapour Absorption technology SQUARE is able to save 200,000 USD per year

THERMAX being the pioneers in Heating, Cooling and Cogeneration was able to understand the whole system and process requirement. Thermax provided dual fuel firing option.

14th MacLeay Street, Sydney, Australia

There is a shortage of electricity on MacLeay Street largely due to an over-demand problem caused by the location, in the middle of Australia's most densely populated area and there is no chance of building a sub-station on such a valuable real estate. Faced with this problem, Pomeroy Apartments, the new swish nine floor apartment block in Potts point, chose Thermax Gas Fired Vapor Absorption Chiller(VAC) 220 NTR (772 kW), as gas is a reliable and green source of energy. With the help of Thermax's Gas Fired Vapor Absorption Chiller, the residents of Pomeroy apartments can breathe free without any worries of electricity cuts and high electricity bills.



Center Mario Enrique Simonsen, Brazil

The enterprise Center Mario Enrique Simonsen was searching for a complete solution in Cooling , Heating & Cogeneration. After evaluating various options, the Center decided to go for Vapor Absorption Chillers because of high plant efficiency, elimination of incremental cost of electric cooling, operational flexibility, elimination of use of CFC and HCFC refrigerants, quite & vibration free operation, high reliability and low maintenance. A complete package of Cooling, Heating & power generation helped Center Mario Enrique Simonsen to save 2,408,950 USD /year.

Beating the heat at BBC, UK

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 service the BBC along with their consultants unanimously decided to award the contract to Thermax.



SASREF (Saudi Aramco Shell Refinery), Saudi Arabia

Thermax supplied a 270 TR (948 kW) Ton single effect chiller, with special double redundant PLC, titanium tubes / cladding to handle sea water, flameproof components and DCS connectivity. Thermax chiller replaced existing vapor absorption Chiller. It uses sea cooling water for the facility supplied by canals of the size of a river.



Holistic Customer Care

Thermax Absorption Cooling Division has a wide network of Service Centers throughout the globe to ensure quick response to customers. With a cumulative service experience of over 2500 VACs operating for more than 15 years, 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 :

- ▶ Preventive maintenance contract
- ▶ Operations & manning
- ▶ Localized customer training programs.

Global Quality Standards



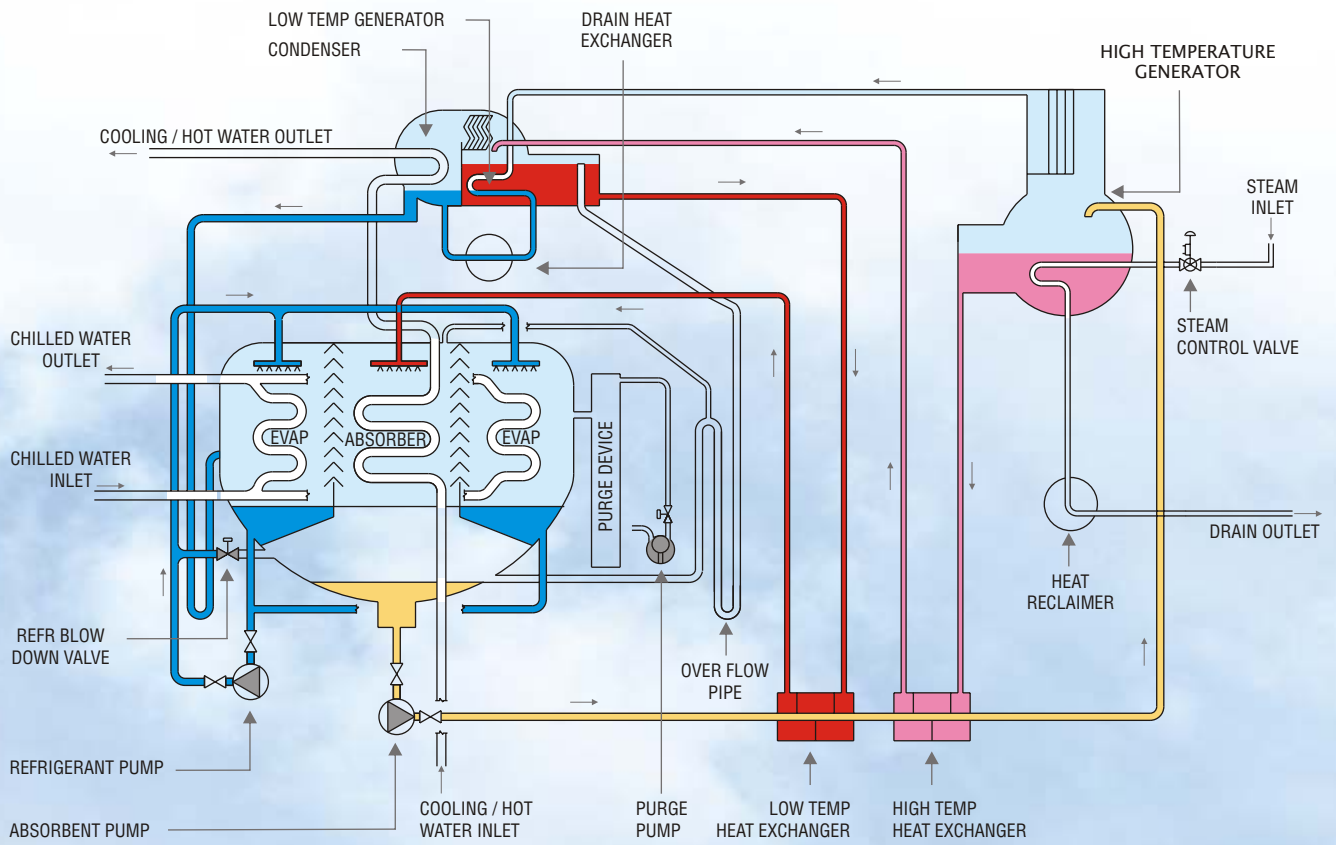
Thermax quality management system is ISO 9001 : 2000 certified and Accredited by ANSI - RAB, DAR in addition to UKAS. Thermax Vapor Absorption Chillers are exported to more than 35 countries world wide. Our quality standards are confirmed by the fact that over the years we have installed many machines in USA, Germany, UK, Spain, Italy, Middle east and South East Asea, with the products conforming to the respective country standards. Thermax pressure part manufacturing is approved by ASME and bears S, U, H, R, stamps. The Vapor absorption chillers are CE certified for European Union and ETL listed for US and Canadian market. They even confirm to the Kyoto Protocol & are in absolute tandem with Clean Development Mechanism Code (CDM). Thermax also conforms to Environment Management System standard 14001 and OHSAS 18001.

A critical parameter in our quality assurance process is testing processes to ensure vacuum tightness. The tests include;

- Nitrogen pressure test on shell side
- Helium spray test
- Helium shroud test

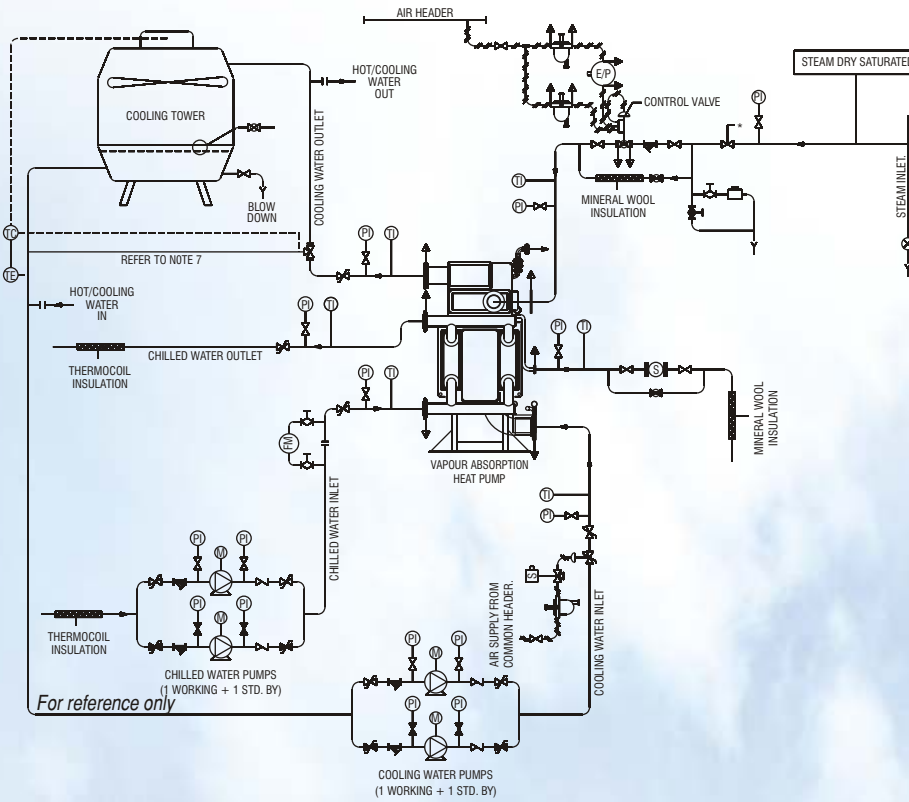
Cycle Diagram

Double Effect Steam Driven Absorption Chiller



- | | |
|---|---|
| CONCENTRATED ABSORBENT | REFRIGERANT |
| INTERMEDIATE ABSORBENT | VAPORIZED REFRIGERANT |
| DILUTED ABSORBENT | |

Typical System P&I Diagram Single Effect Steam Driven Absorption Machines



LEGENDS

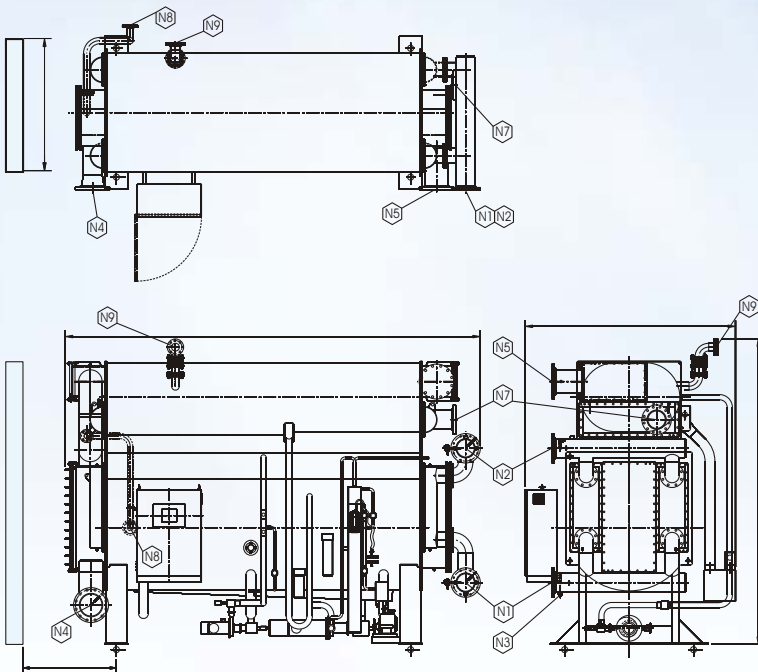
- GATE VALVE (OPEN)
- GATE VALVE (CLOSED)
- GLOBE VALVE (OPEN)
- GLOBE VALVE (CLOSED)
- NON RETURN VALVE
- COCK
- CONTROL VALVE (OPEN)
- CONTROL VALVE (CLOSED)
- "Y" STRAINER
- BUTTERFLY VALVE (OPEN)
- BUTTERFLY VALVE (CLOSED)
- INVERTED BUCKET STEAM TRAP
- THERMODYNAMIC STEAM TRAP
- BALANCE VALVE
- THERMOSTAT
- PNEUMATIC LINE
- AIR FILTER REGULATOR
- PUMP
- MOTOR
- CURRENT TO PNEUMATIC CONVERTER

CLIENT SCOPE THERMAX SCOPE

Note
 Static pressure at the condensate outlet shall be constant and not exceed 1 kg/cm² (g)

P - PRESSURE	R - RECORDER
T - TEMPERATURE	L - LEVEL
F - FLOW	M - METER
I - INDICATOR	L - LOW

Typical General Arrangement Single Effect Steam Driven Absorption Machines



Clearance for tube removal (Any one side)

NOZZLE	NOZZLE FL. RATING	DESCRIPTION	QTY
N1	ANSI # 150	CHILLED WATER INLET	1
N2	ANSI # 150	CHILLED WATER OUTLET	1
N3	BSP (F)	CHILLED WATER DRAIN PLUGGED	1
N4	ANSI # 150	COOLING WATER INLET	1
N5	ANSI # 150	COOLING WATER OUTLET	1
N6	BSP (F)	COOLING WATER DRAIN PLUGGED	1
N7	ANSI # 150	STEAM INLET	1
N8	ANSI # 150	DRAIN OUTLET	1
N9	ANSI # 150	RUPTURE DISC	1

1. Indicates the position of anchor bolts.
2. Minimum installation clearance
 - Control Panel Side : 1200 mm
 - Top : 200 mm
 - Other : 500 mm



Technical Specifications

Single Effect Steam Driven Absorption Machines

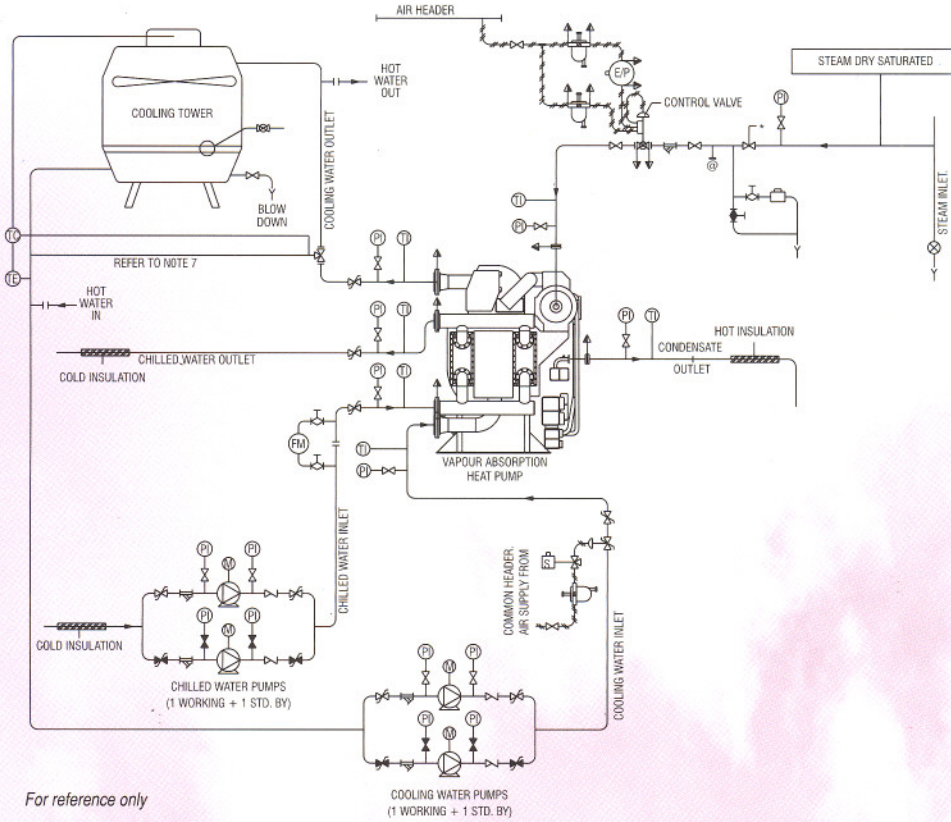
Model Number	Units	SS 20A C	SS 20B C	SS 20C C	SS 20D C	SS 30A C	SS 30B C	SS 30C C	SS 40A C	SS 40B C	SS 40C C	SS 50A C	
Cooling Capacity	TR	98	118	148	179	219	246	293	331	374	410	461	
Chilled Water Circuit	Flow rate	m ³ /hr	53.7	64.7	81.1	98.1	120.1	134.9	160.7	181.5	205.1	224.8	252.8
	No. of passes (Evaporator)	#	3	3	2	2	2	2	2	2	2	2	2
	Friction loss	mWC	3.8	4.7	5.3	7.0	4.9	5.6	8.5	6.1	6.4	6.9	6.2
	Connection Diameter	mmNB	100	100	100	100	150	150	150	150	150	150	200
Cooling Water Circuit	Flow rate	m ³ /hr	98	118	148	179	219	246	293	331	374	410	461
	Outlet Temp	°C	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
	No. of passes (Absorber)	#	3	3	2	2	2	2	2	2	2	2	2
	No. of passes (Condensor)	#	1	1	1	1	1	1	1	1	1	1	1
Steam Circuit	Friction loss	mWC	2.9	3.0	3.7	3.9	3.6	3.6	5.7	5.4	5.4	5.5	5.8
	Connection Diameter	mmNB	150	150	150	150	200	200	200	250	250	250	250
	Steam Consumption	kg/hr	746	900	1120	1354	1660	1866	2217	2507	2828	3112	3493
Overall Dimension	Length	mm	2950	2950	3970	3970	3990	3990	4595	5050	5050	5050	5050
	Width	mm	1700	1700	1700	1700	2030	2030	2030	2050	2050	2050	2200
Operating Weight	Height	mm	2520	2520	2520	2520	2715	2715	2715	3100	3100	3100	3300
	Weight	x 1000 kg	4.9	5.1	6.5	6.7	7.9	8.3	9.2	11.3	11.8	12.2	14.1
Max. Shipping Weight	x 1000 kg	4.3	4.5	5.8	6.0	6.9	7.3	8.1	9.8	10.3	10.6	12.1	
Clearance for Tube Removal	mm	2400	2400	3755	3755	3815	3815	4100	4100	4100	4100	4100	
Electric Supply	Absorbent Pump Motor Rating	kW(A)	1.1 (3.4)	1.1 (3.4)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	3 (8)	3.7 (11)
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	3 (1.4)	0.3 (1.4)
	Total Electric Input	kVA	6.2	6.2	6.2	6.2	7.4	7.4	7.4	7.4	7.4	9.5	13.6
	Power Supply	415 V(±10%), 50 Hz(±5%), 3 Phase+N											

Model Number	Units	SS 50B C	SS 60A C	SS 60B C	SS 60C C	SS 60D C	SS 70A C	SS 70B C	SS 80A C	SS 80B C	SS 80C C	SS 80D C	
Cooling Capacity	TR	506	592	654	736	817	921	1029	1142	1250	1440	1569	
Chilled Water Circuit	Flow rate	m ³ /hr	277.4	324.6	358.6	403.5	448.0	505.0	564.2	626.2	685.4	789.5	860.3
	No. of passes (Evaporator)	#	2	3	3	2	2	2	2	3	3	2	2
	Friction loss	mWC	6.4	6.0	6.3	4.1	4.4	4.4	4.9	8.9	9.5	6.1	6.5
	Connection Diameter	mmNB	200	250	250	250	250	250	250	300	300	300	300
Cooling Water Circuit	Flow rate	m ³ /hr	506	592	654	736	817	921	1029	1142	1250	1440	1569
	Outlet Temp	°C	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
	No. of passes (Absorber)	#	2	2	2	2	2	2	2	2	2	2	2
	No. of passes (Condensor)	#	1	1	1	1	1	1	1	1	1	1	1
Steam Circuit	Friction loss	mWC	5.9	7.1	7.2	11.9	12.1	11.5	12.4	9.5	10.2	15.6	7.5
	Connection Diameter	mmNB	250	300	300	300	300	350	350	400	400	400	400
	Steam Consumption	kg/hr	3831	4487	4954	5574	6187	6993	7802	8653	9467	10946	11907
Overall Dimension	Connection Diameter (Steam)	mmNB	200	250	250	250	250	300	300	350	350	350	350
	Connection Diameter (Drain)	mmNB	65	65	65	65	65	80	80	80	80	80	80
Operating Weight	Length	mm	5050	6860	6860	8095	8095	8000	8000	8360	8360	9610	9610
	Width	mm	2200	2400	2400	2400	2400	3010	3010	3295	3295	3295	3295
	Height	mm	3300	3525	3525	3525	3525	3890	3890	4385	4385	4385	4385
Max. Shipping Weight	x 1000 kg	14.6	23.1	24.0	28.0	29.3	32.1	33.0	43.0	43.9	49.0	49.9	
Clearance for Tube Removal	mm	4100	5320	5320	6560	6560	6560	6560	6560	6560	7910	7910	
Electric Supply	Absorbent Pump Motor Rating	kW(A)	3.7 (11)	5.5 (14)	5.5 (14)	5.5 (14)	5.5 (14)	6.6 (17)	6.6 (17)	4.5 (13)	4.5 (13)	4.5 (13)	4.5 (13)
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)
	Total Electric Input	kVA	13.6	13.6	13.6	16.3	16.3	18.4	18.4	18.4	18.4	15.5	15.5
	Power Supply	415 V(±10%), 50 Hz(±5%), 3 Phase+N											

BASIS

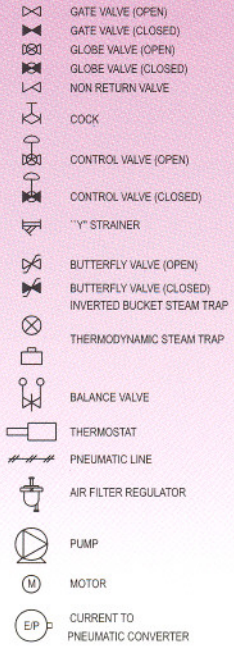
- Cooling water inlet temperature = 29.4°C
- Rated current for Purge pump = 1.9 A and Control panel = 1.5 A
- Minimum Cooling water inlet temperature is 20°C
- Maximum Allowable pressure in chilled / cooling water system = 8 kg/cm²(g)
- Standard steam pressure is 1.5 kg/cm² (g) (21.3 psig) pressure in dry saturated condition
- Maximum Allowable pressure in steam system = 5 kg.cm²(g) (71 psig)
- All Nozzle connections to suit ASME B16.5 Class 150
- Ambient condition shall be between 5 to 45°C
- Technical specification is based on ARI 560.

Typical System P&I Diagram Double Effect Steam Driven Absorption Chillers



For reference only

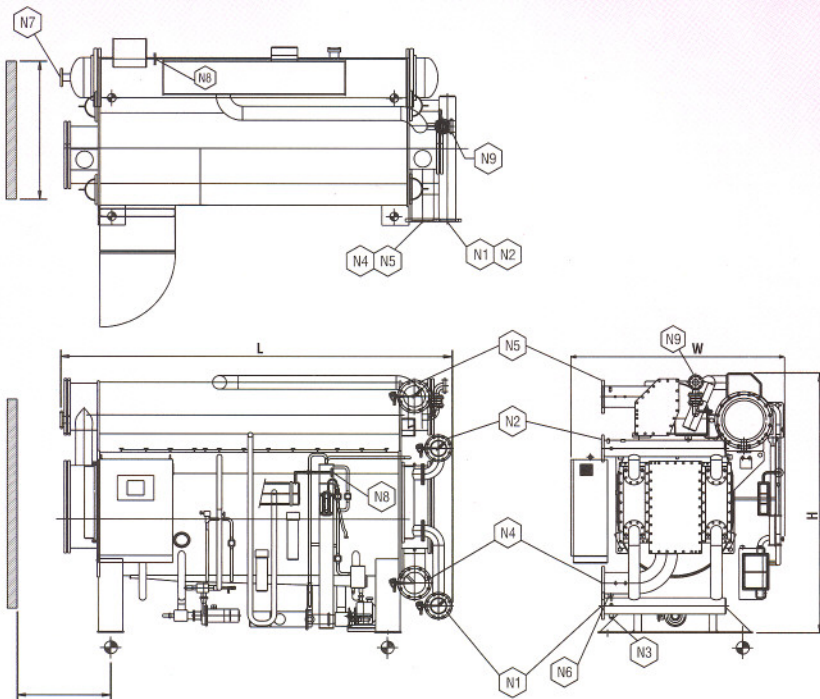
LEGENDS



Note
Static pressure at the condensate outlet shall be constant and not exceed 1 kg/cm² (g)

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T - TEMPERATURE L - LEVEL
F - FLOW M - METER
I - INDICATOR L - LOW

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N4	ANSI # 150	COOLING WATER INLET	1
N5	ANSI # 150	COOLING WATER OUTLET	1
N6	BSP (F)	COOLING WATER DRAIN PLUGGED	1
N7	ANSI # 150	STEAM INLET	1
N8	ANSI # 150	CONDENSATE OUTLET	1
N9	ANSI # 150	RUPTURE DISC	1

- Indicates the position of anchor bolts.
- Minimum installation clearance
 - Control Panel Side : 1200 mm
 - Top : 200 mm
 - Other : 500 mm

For reference only

Technical Specifications

Double Effect Steam Driven Absorption Chillers

Model Number	Units	SD 20A CX	SD 20B CX	SD 20C CX	SD 20D CX	SD 30A CX	SD 30B CX	SD 30C CX	SD 40A CX	SD 40B CX	SD 40C CX	SD 50A CX	
Cooling Capacity	TR	111	130	162	192	241	272	321	360	408	452	505	
Chilled Water Circuit	Flow rate	m ³ /hr	60.9	71.3	88.8	105.3	132.0	149.1	176.0	197.4	223.7	247.8	276.9
	No. of passes (Evaporator)	#	3	3	2	2	2	2	2	2	2	2	
	Friction loss	mWC	4.8	5.7	6.3	8	5.9	6.7	10.0	7.1	7.5	8.3	7.3
	Connection Diameter	mmNB	100	100	100	100	150	150	150	150	150	150	200
Cooling Water Circuit	Flow rate	m ³ /hr	111	130	162	192	241	272	321	355	408	452	505
	Outlet Temp	°C	34.85	34.85	34.85	34.85	34.7	34.7	34.7	34.7	34.7	34.7	34.7
	No. of passes (Absorber)	#	3	3	2	2	2	2	2	2	2	2	2
	No. of passes (Condensor)	#	1	1	1	1	1	1	1	1	1	1	1
	Friction loss	mWC	3.9	3.8	4.6	4.7	4.5	4.6	7.1	6.6	6.7	7.0	7.2
Steam Circuit	Connection Diameter	mmNB	150	150	150	150	200	200	200	250	250	250	250
	Steam Consumption	kg/hr	433	507	632	749	933	1054	1244	1395	1581	1753	1958
	Connection Diameter (Steam)	mmNB	50	50	50	50	65	65	65	80	80	80	80
	Connection Diameter (Drain)	mmNB	25	25	25	25	40	40	40	40	40	40	40
Overall Dimension	Length	mm	3000	3000	3800	3800	4000	4000	4700	4900	4900	4900	5100
	Width	mm	2000	2000	2000	2000	2150	2150	2150	2500	2500	2500	2650
	Height	mm	2600	2600	2600	2600	2700	2700	2700	2900	2900	2900	3200
Operating Weight	x 1000 kg	4.6	4.9	5.9	6.4	8.1	8.6	10.2	12.2	12.7	13.3	15.4	
Max. Shipping Weight	x 1000 kg	4.2	4.5	5.4	5.9	7.4	7.8	9.3	11.2	11.6	12.1	14.0	
Clearance for Tube Removal	mm	2400	2400	3755	3755	3815	3815	4100	4100	4100	4100	4100	
Electric Supply	Absorbent Pump Motor Rating	kW(A)	1.1 (3.4)	1.1 (3.4)	2.2 (6.0)	2.2 (6.0)	2.2 (6.0)	2.2 (6.0)	2.2 (6.0)	3.0 (8)	3.0 (8)	3.0 (8)	3.7 (11)
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)
	Total Electric Input	kVA	5.9	5.9	7.8	7.8	7.8	7.8	7.8	9.2	9.2	9.2	11.4
	Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N										

Model Number	Units	SD 50B CX	SD 60A CX	SD 60B CX	SD 60C CX	SD 60D CX	SD 70A CX	SD 70B CX	SD 80A CX	SD 80B CX	SD 80C CX	SD 80D CX	
Cooling Capacity	TR	560	636	709	802	890	993	1107	1251	1372	1570	1685	
Chilled Water Circuit	Flow rate	m ³ /hr	307.0	348.7	388.7	439.7	488.0	544.5	607.0	685.9	752.3	860.8	923.9
	No. of passes (Evaporator)	#	2	3	3	2	2	2	2	2	2	2	
	Friction loss	mWC	7.7	6.8	7.3	4.8	5.2	5.1	5.6	4.2	4.6	7.1	7.5
	Connection Diameter	mmNB	200	250	250	250	250	250	250	300	300	300	300
Cooling Water Circuit	Flow rate	m ³ /hr	560	636	709	802	890	993	1107	1251	1372	1570	1685
	Outlet Temp	°C	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.7	34.7
	No. of passes (Absorber)	#	2	2	2	1	1	2	1	2	2	1	1
	No. of passes (Condensor)	#	1	1	1	1	1	1	1	1	1	1	1
	Friction loss	mWC	7.5	7.7	7.9	5.4	5.7	12.8	6.0	11.8	12.7	7.2	7.6
Steam Circuit	Connection Diameter	mmNB	250	300	300	300	300	350	350	400	400	400	400
	Steam Consumption	kg/hr	2175	2455	2731	3116	3449	3834	4276	4818	5284	6073	6520
	Connection Diameter (Steam)	mmNB	80	100	100	100	100	125	125	125	125	125	125
	Connection Diameter (Drain)	mmNB	40	50	50	50	50	65	65	65	65	65	
Overall Dimension	Length	mm	5100	6700	6700	7900	7900	7900	7900	8100	8100	9350	9350
	Width	mm	2650	2900	2900	2900	2900	3150	3150	3550	3550	3550	3550
	Height	mm	3200	3350	3350	3350	3350	3800	3800	4100	4100	4100	4100
Operating Weight	x 1000 kg	16.1	25.7	26.8	31.0	32.6	37.7	39.5	47.7	49.7	56.3	58.8	
Max. Shipping Weight	x 1000 kg	14.6	23.1	24.1	28.4	29.5	33.3	35.1	42.7	44.7	50.3	52.8	
Clearance for Tube Removal	mm	4100	5320	5320	6560	6560	6560	6560	7910	7910	7910	7910	
Electric Supply	Absorbent Pump Motor Rating	kW(A)	3.7 (11)	5.5 (14)	5.5 (14)	5.5 (14)	5.5 (14)	6.6 (17)	6.6 (17)	7.5 (20)	7.5 (20)	7.5 (20)	7.5 (20)
	Refrigerant Pump Motor Rating	kW(A)	0.3 (1.4)	0.3 (1.4)	0.3 (1.4)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)	1.5 (5)
	Total Electric Input	kVA	11.4	13.5	13.5	16.1	16.1	18.3	18.3	20.4	20.4	20.4	20.4
	Power Supply		415V(±10%), 50Hz(±5%), 3 Phase+N										

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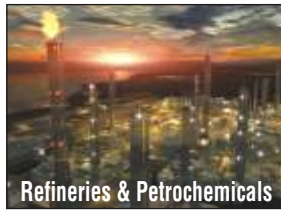
- Cooling water inlet temperature = 29.4°C
- Rated current for Purge pump = 1.9 A and Control panel = 1.5 A
- Minimum Cooling water inlet temperature is 10°C
- Maximum Allowable pressure in chilled / cooling water system = 8 kg/cm²(g)
- Steam at Control Valve Inlet is at 8 kg/cm²(g) pressure in dry saturated condition
- Maximum Allowable pressure in steam system = 10.5 kg/cm²(g)
- All Nozzle connections to suit ASME B16.5 Class 150
- Ambient condition shall be between 5 to 45°C
- Technical specification is based on ARI 560.



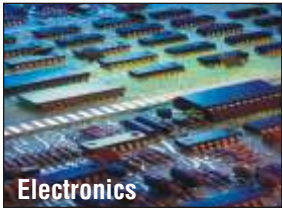
Textiles



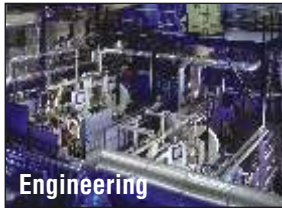
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THERMAX

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Cooling & Heating Division

Thermax Ltd, INDIA

D-13 MIDC, R.D.Aga Road, Chinchwad, Pune 411 019, India. Tel.: +91-20-2747 5941 Fax: +91-20-2747 5907 Email: acdmktg@thermaxindia.com

Thermax Inc., USA

40440 Grand River Avenue, Novi Michigan 48375, U.S.A Tel: 00-1-248-4743050 Mob : 714-393-1628 Fax: 00-1-248-4745790 Email: ssshastri@thermax-usa.com, rnabar@thermax-usa.com

Thermax Europe Ltd, U.K.

Tel : 00-44-1582-727756 Fax : 00-44-1582-731538 Email : dinesh@thermax-europe.com www.thermax-europe.com

Thermax Hong Kong Ltd

Tel : (852) 2584 6199 Fax : (852) 2584 6133 Email : vaishnav@thermax-china.com www.thermax-china.com

Thermax Rus Ltd, Russia

Tel : 00-7095-935049/91 Fax : 00-7095-1347410 Email : thermax-moscow@concord.ru

Thermax Ltd, U.A.E.

Tel : 00-971-4-8816481 Fax : 00-971-4-8816039 E-mail : thermax@emirates.net.ae

Thermax Ltd, Saudi Arabia

Tel : 00-966-3-857-5056 Fax : 00-966-3-857-5068 Email : shafi@thermaxme.com

Thermax Ltd, Kenya

Tel : 00-254-20-4440233 Fax : 00-254-20-4451919 Email : milind@spenomatic.net

Thermax Ltd, Thailand

Tel : 00-66-02-381-5423 Fax : 00-66-02-381-8987 Email : hexaacd@bkk3.foxinfo.co.th

Thermax do Brasil

Tel : +5521-2516 9227 Fax : +5521-2516 9226 Email : rajesh.sinha@thermaxdobrasil.com.br www.thermaxdobrasil.com.br

Thermax Ltd, Malaysia

Tel : 00-60-3-2166 9801 Fax : 00-60-3-2166 9802 Email : thermax@tm.net.my

Thermax Ltd, Bangladesh

Telefax : 008802-9885823 Mob : 0088011808001 Email : madhav@worldnetbd.net

Thermax Ltd, Srilanka

Tel : 00-9411-4407969 Fax : 00-9411-2533217 Email : sanjaym@dialogsl.net

www.thermaxindia.com

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