ABSORPTION CHILLER PRODUCT CATALOGUE

China Top 500 Enterprises

SHUANGLIANG
ECO-ENERGY

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Our Customers

600 Sales&Service Engineers

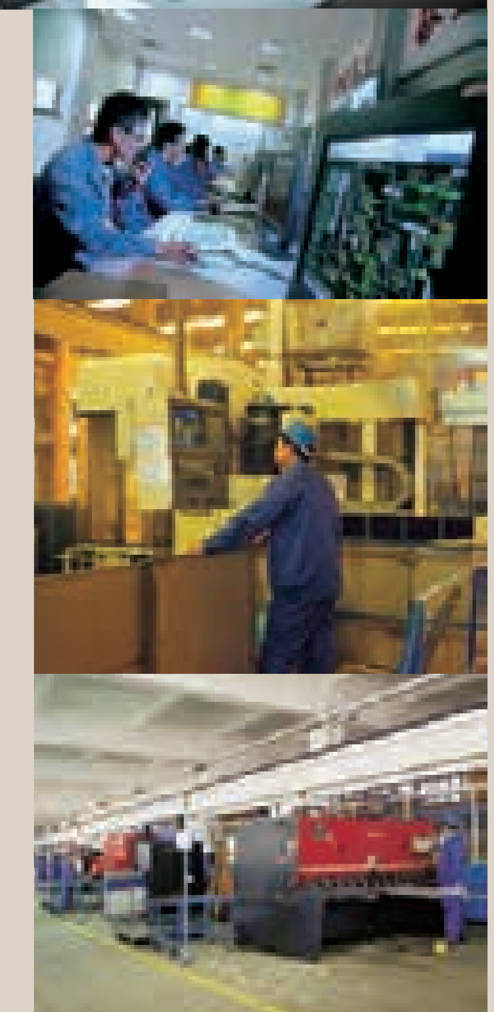
100 Service Stations

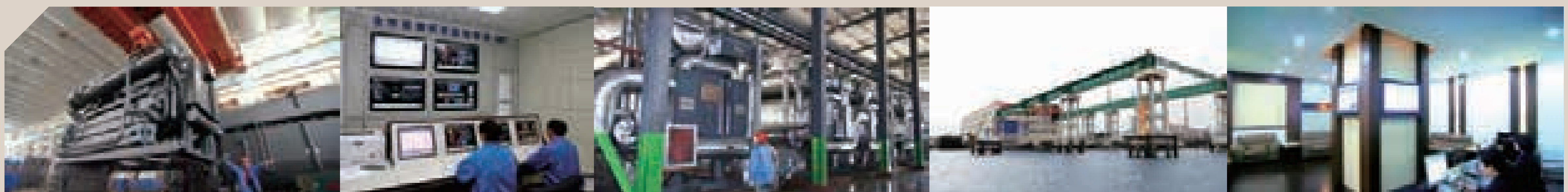
With about 100 sales and service branches around the world, we keep zero distance with customers.

Over 25,000 absorption chillers have been sold to more than 100 countries and regions.

DFM

DEMAND FOLLOWS MANUFACTURING

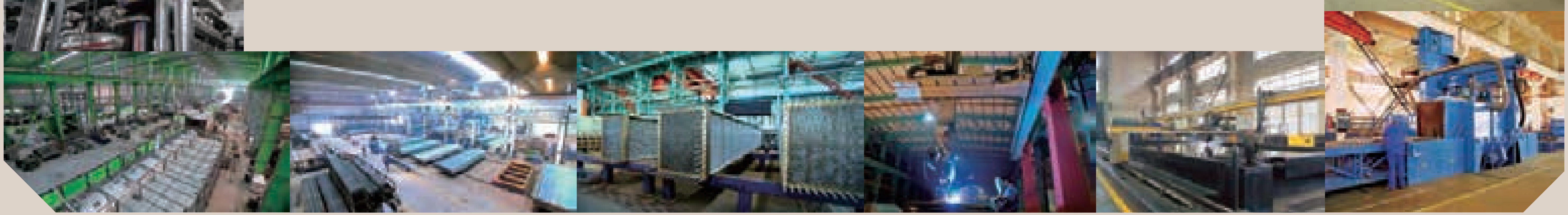




The DFM technology guarantees the world advanced production quality

DFM technology is one of the advanced technologies covering the needs of customers. Shuangliang meets the requirements of customers by zero defect and shortest delivery period through DFM technology and quality management system.

The quality of Shuangliang products is guaranteed by several hundreds of imported equipments, such as plasma cutting machines, horizontal and vertical machine centers, numerical controlled drilling and mill centers, welding robots and helium leak detectors, and full performance test platforms.



Certificates

Features of Product

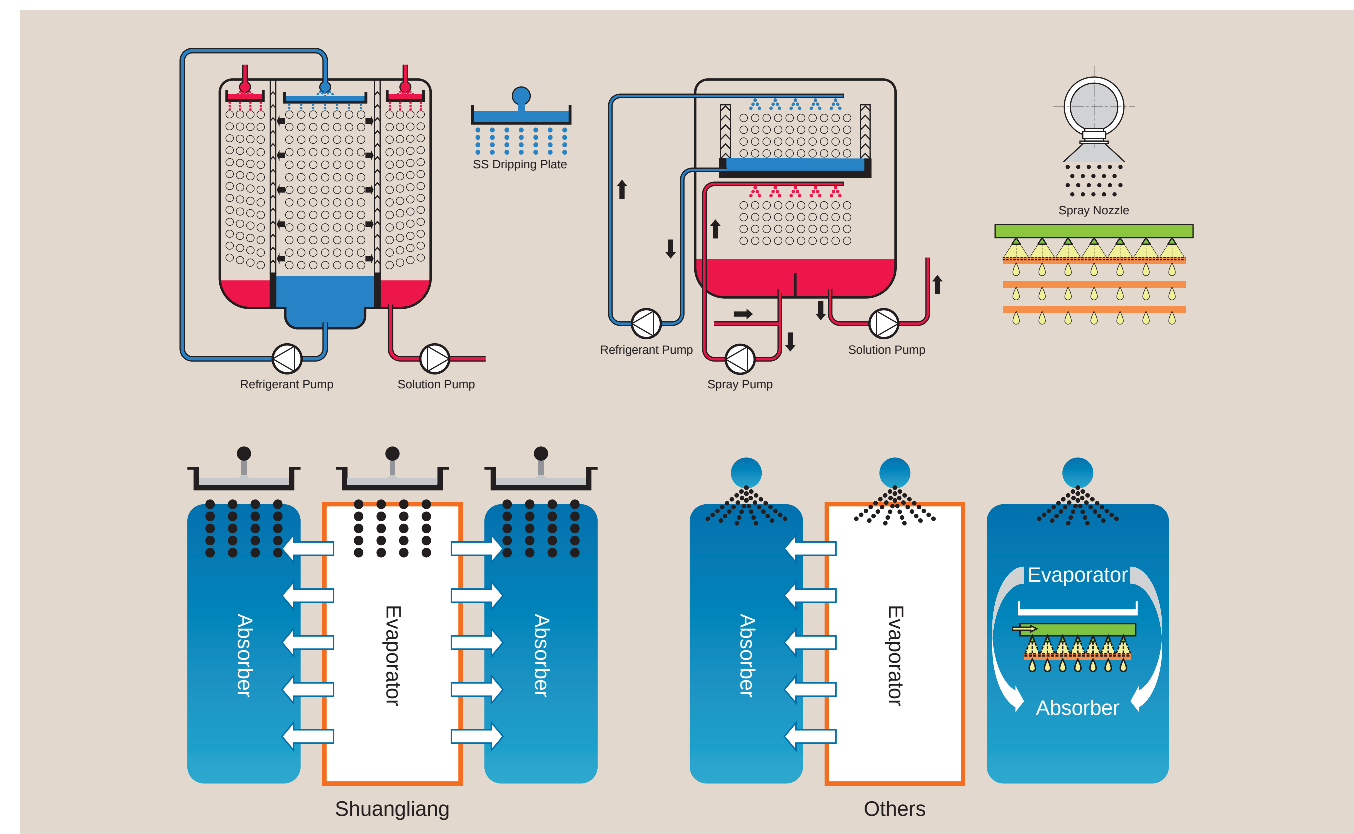
Leading technology has been used to ensure the superior performance of chiller

1. Two Pumps and without Spray Nozzles

Left-Middle-Right arrangement: absorber-evaporator-absorber;
Absorbers with dripping plates instead of spray nozzles;
Avoid the decrease of cooling capacity;
Prolong the operation life of chiller.

2. State-of-the-Art Liquid Heat Exchanger

High-efficiency heat transfer tubes with new flow pattern;
Reduce flow pressure drop.



3. Distribution of Refrigerant by Dripping Plates in the Evaporator

Efficient utilization of heat transfer area;
Reduce liquid film thickness;
Improve operating efficiency;
Reduce power consumption of refrigerant pump.

4. High Quality Tubes and Optimized Flow Arrangement in Evaporator

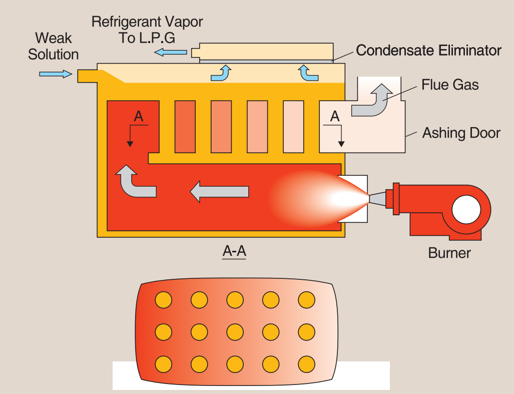
Ensure even distribution of heat transfer effect;
Enhance heat transfer efficiency.

Features of Product

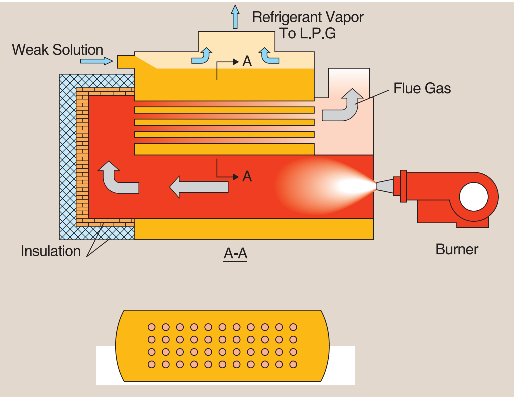
5. Special Construction of High Pressure Generator for Direct-Fired Chiller

Inside solution tubes and wet back of combustion chamber;

Improve operation safety and reducing fuel consumption.



Flow Chart of H.P. Generator (Water Tube)



Flow Chart of H.P. Generator (Fire Tube)

6. Heat Transferring Technology

Ensure safer operation and extending life cycle;

Higher heat transfer efficiency of 93.5%.

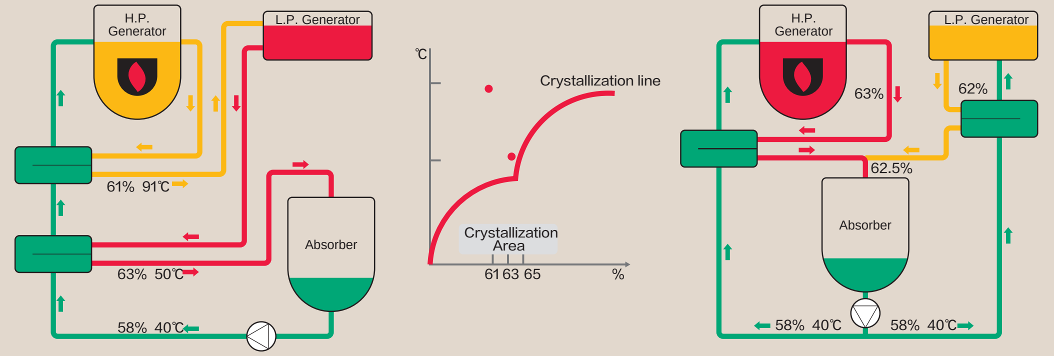
7. Anti-Freezing Technology

Evaporator tubes are protected from freezing. It is realized by collecting the refrigerant water from the condenser at the bottom chamber of the evaporator, and then pumped to the dripping plates. Thus the refrigerant dripping process would be stopped immediately if the refrigerant pump was powered off.

8. Serial Flow of Solution

Free from crystallization;

Improve reliability and simplify control of chiller.



Series Circulation

Parallel Circulation

9. Non-condensable Gas Purging System

Air inlets of purging device arranged inside the unit to ensure optimum air suction performance;

10. Non-condensable Gas Auto Discharge System

Control the start-up and shutdown of solenoid valve which is activated by the high pressure and low pressure settings of auto-purging cylinder, thus auto start/stop of vacuum pump and gas discharge are realized.

11. SL Remote

SLRemote monitoring system is built based on Shuangliang internal servers, and users can easily visit through website with the right registered

account and password to look through chiller information.

Functions: data collection, online monitoring, data storage and management, data analysis and expert diagnosis, fault early warning and alarm

All these patented and advanced technologies make the operation more efficient, reliable and easier.

High Air-Tightness

Two special measures are adopted to improve the air-tightness of Shuangliang absorption chillers:

(1)The chiller and its parts have been inspected by helium mass spectro leak tester with leakage rate of 1×10^{-10}Pa·m^3/s, which is 4 order lower than 2.03×10^{-6}Pa·m^3/s specified by Japanese Industrial Standard JISB8662-1994. Shuangliang is one of the first to apply helium mass spectrometer to test the whole unit in China Central Air Conditioning Industry.

(2)A patented automatic purging unit is installed to purge out non-condensable gases during operation and to ensure vacuum inside the chiller.

High Air-Tightness Brings Great Payback

(1)Avoid the decrease of cooling capacity;

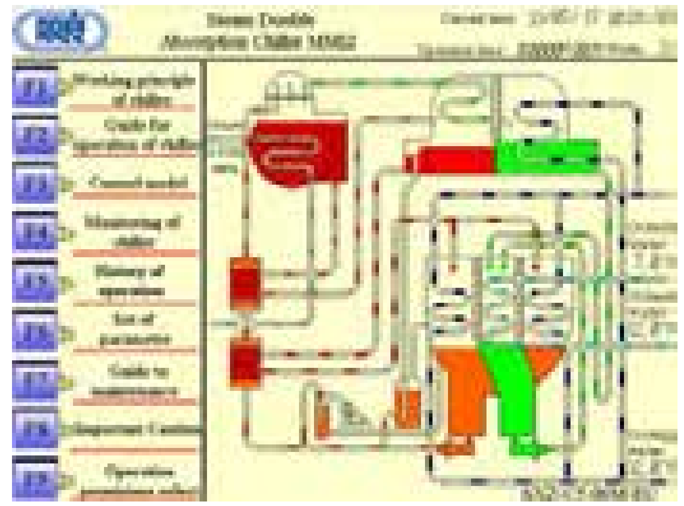
(2)High reliable operation with less maintenance and repair.

The Decisive Factor to Guarantee the Quality of Lithium Bromide Absorption Chiller

Lithium bromide absorption chiller is operating under high vacuum, which would be impaired by leaking of air into the chiller and non-condensable gases generated inside due to corrosion. Poor vacuum will reduce cooling capacity and even increase the corrosion of metal parts in chiller.

Intelligent Control System

Convenient Man-Machine Interface



Parameter-setting

Parameters, such as chilled (hot) water outlet temperature, can be set in accordance with the requirements to ensure parameters predetermined or optimize operation conditions.

Control mode selection

Auto/Manual control mode can be selected by pressing on the touch screen as per displayed instructions.

Protection from intentional or unintentional maloperation

The unit is protected from intentional or unintentional maloperation. Parameter setting can only be approved with password.

Guidance to operation and maintenance

Instructions to working principles, operation and maintenance are displayed to enable operators to understand the operation method and maintenance information directly and rapidly, which facilitates the unit management and prolongs the service life of the unit.

Timer for Automatic Switch on/off

By pre-setting, the switch-on/off timer on the touch screen or centralized monitoring computer, the unit can be automatically started or stopped at the preset time.

Interlock Strategy

Cooling tower fan, chilled (hot) and cooling water pumps can be connected to the unit control panel to realize interlock control of these devices on the external systems.

Reliable and Convenient Centralized Control System(Operational)

Functions like automatic change-over, central control, data storage and printing, etc. can be realized by MMI2 software which is developed by Shuangliang. In such a way, malfunctions, alarms, operation data and conditions will be automatically displayed on a computer. Energy input can be adjusted based on actual load so as to optimize operation and save energy.

Connection to Building Management System(BMS) (Operational)

Cables of RS232, RS422 and RS485 can be selected to connect the unit control panel to BMS with a communication module so that control of the unit can be realized by BMS.

Real-Time Remote Monitoring and Control (Operational)

While it is offsite, the unit can still be monitored and controlled on real-time basis. If requested, a touch screen can be installed in the control room to realize real-time remote monitoring and control. Other functions like operation data storing and printing are also available in the control room.

Shuangliang control and monitoring center is able to carry out regular inspection on the units located in users' machine rooms to analyze the operation status anytime. Should there be any abnormality during operation, the unit control system can automatically send the operation data to Shuangliang control and monitoring center for malfunction diagnosis.

Inverter Control of Cooling Water Pump (Operational)

Cooling water flowrate can be adjusted by the cooling water pump with an inverter according to actual operation conditions. In such a way, electricity consumption of pumps can be saved.

Advanced Analog Adjustment of Cooling (Heating) Capacity

Highly precise control of chilled (hot) water outlet temperature can be realized by analog system which is developed by Shuangliang. Such a control strategy can stabilize chilled (hot) water outlet temperature thus improves the operation efficiency and makes the unit more suitable for places that are highly temperature-sensitive.

Solution Pump Frequency Control

Frequency control of solution pump is realized by an inverter to optimize solution flowrate thus to improve the efficiency and reduce startup time & energy consumption.

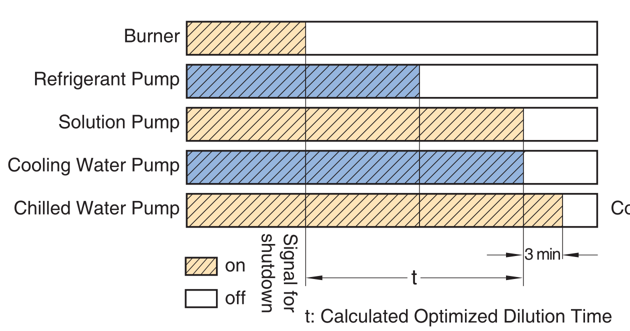
Favorable Dilution Cycle

The control system calculates the concentration of sprayed strong solution to optimize dilution cycle, which can not only prevent crystallization but also shorten the re-start time.

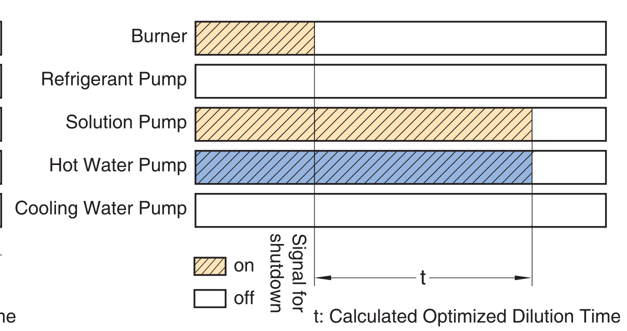
Concentration Limit Control

The solution concentration control, allows the unit to operate under high concentration safely and stably by monitoring the spray concentration of the strong solution and controlling the heating capacity, thus not only to prevent crystallization but also to improve the operation efficiency of the unit.

Dilution Process during Shutdown under Cooling Mode



Dilution Process during Shutdown under Heating Mode



Failure Management System

When failure of the unit occurs, the location, problem and solution of failure shall be displayed by interface, thus operator could deal with the failure easily and quickly, to improve the operation efficiency of the unit. The control system also automatically keeps operation data and the last five failures in memory for a week, and various parameters are also available anytime.

Real-Time Display of Operation Conditions

Advanced PID control technology and touch screen are adopted in the control system. Real-time operation conditions are revealed by easily understood texts and pictures, which enables the operator to take timely measures in case of emergency.

Specific Working Principle and Operation & Maintenance Instructions Displaying

This function ensures easy operation thus operator can properly manage the unit, which greatly improves the operation life of the unit and guarantees efficiency.

Display of Parameters

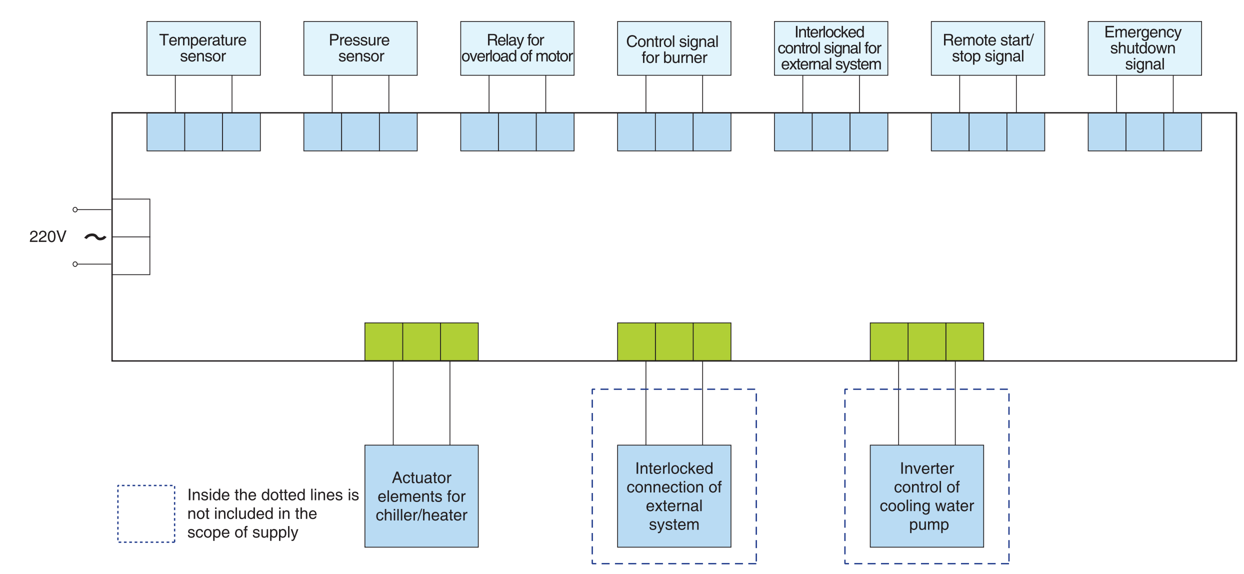
Data Display	Chilled (hot) water inlet temperature	Evaporating temperature
	Chilled (hot) water outlet temperature	Flue gas temperature
	Cooling water inlet temperature	HPG pressure
	Intermediate solution temperature from HPG	Pressure of auto purging unit
	Concentrated solution temperature from LPG	Chiller operation time
	Strong solution spray temperature	Vacuum pump start/stop number
	Condensation temperature	Strong solution dynamic
	De-crystallizing pipe temperature	

Working principle	Cooling flow chart	Heating flow chart
	Working principle of chiller	Working principle of heater

Operation instructions	Operation of chiller	Refrigerant by-pass
	Operation of heater	Leak test of unit
	Operation of chilled (hot) and cooling water pumps	Solution charge
	Burner operation	Removal of solution from unit
	Operation of vacuum pump	Rotation direction test for canned motor-pumps
	Sampling of refrigerant	Change of valve sealing rings

Maintenance instructions	Routine maintenance	Cooling	Unit
			System
		Heating	Unit
			System
	Prolonged outage		

Control System Diagram



1 Flue Gas Operated Lithium Bromide Absorption Chiller/Heater

Trigeneration System

With oil or gas as the prime energy, trigeneration (CCHP/BCHP) provides power, heating and/or cooling for community or buildings. It can realize cascade energy applications, such as high grade energy used for power generation and less potential energy for heating and/or cooling, which can raise the power utilization rate to 85%. Since it gives additional power supply to the society and reduces the energy consumption by air-conditioner installation, trigeneration system plays an active role in solving power supply shortage.

In the trigeneration system, lithium bromide absorption chiller/heater operated by high temperature flue gas (or flue gas and waste hot water) can fully utilize the low potential heat energy, efficiently improve the integrated energy application rate.

The waste heat, which is usually discharged into atmosphere, now is utilized to drive the lithium bromide absorption chiller/heater, and realize the cascade application of prime energy resource.

Flue Gas Operated Lithium Bromide Absorption Chiller/Heater

Flue gas operated lithium bromide absorption chiller/heater is operated by flue gas from generators and other heat sources, falling into two categories: flue gas operated and flue gas/hot water operated. High temperature flue gas operated absorption chiller/heater is mainly applicable to the trigeneration installations with turbo generators (including micro turbine). For flue gas-hot water type, main heat sources can be flue gas and jacket water from internal combustion engine. These types can be used in other places where high temperature flue gas is available and air conditioning is necessary.

In order to meet the technological needs, lithium bromide absorption chiller/heater with after burners can be installed where heat of flue gas (or flue gas and hot water) is not enough to drive them.

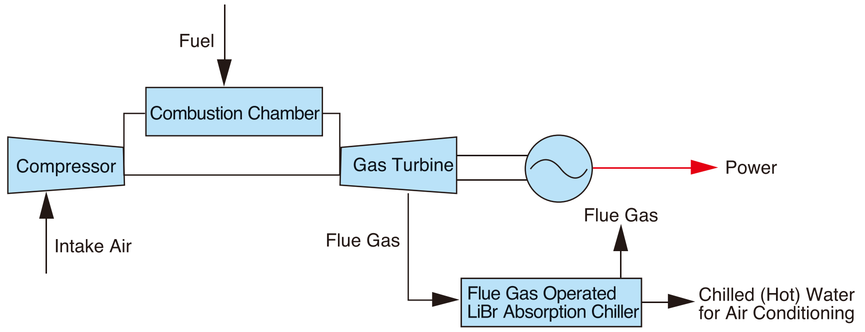
For trigeneration systems driven by internal combustion engines, if flue gas supply is sufficient for the air-conditioning requirements, jacket hot water can be used for other applications, and backup burner on the chiller will be an option.

Typical Modes for Application of Trigeneration System with Flue Gas Operated Lithium Bromide Absorption Chiller/Heater

◆Mode 1: Gas Turbine+Flue Gas Operated Lithium Bromide Absorption Chiller

Working Principle

Fuel is burned in the gas turbine combustion chamber, producing high pressure and temperature gas to drive gas turbine generator, flue gas directly enters lithium bromide absorption chiller/heater to produce chilled (hot) water for air conditioning.



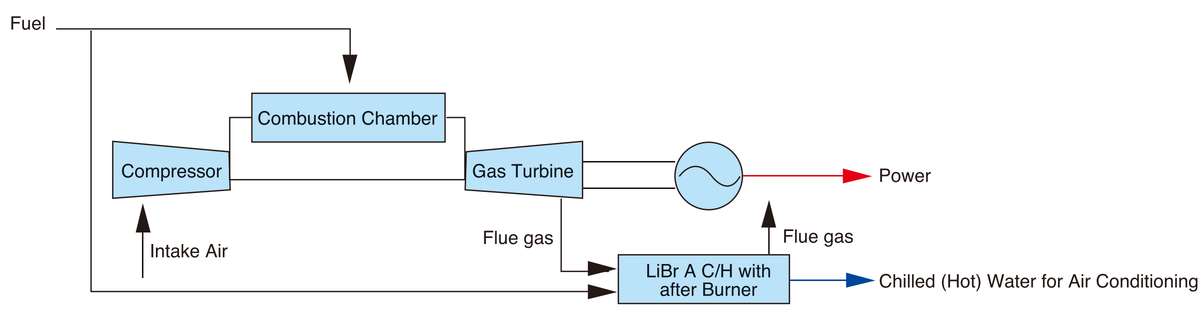
◆Application Features

- Gas turbine generator is based on simple cycle, which is beneficial to improve waste heat utilization rate.
- Flue gas from gas turbine is used in flue gas operated lithium bromide absorption chiller/heater,/which can simplify system configuration, save equipment investment, and improve the energy integrated utilization in system.
- This mode is applicable to the trigeneration system with gas turbine generator.

◆Mode 2: Gas Turbine+Flue Gas Operated Lithium Bromide Chiller/Heater with after Burner

Working Principle

Fuel is burned in the gas turbine combustion chamber to produce high pressure and temperature gas to drive gas turbine generator, flue gas directly enters lithium bromide absorption chiller/heater with after burner to offer chilled (hot) water for air conditioning. When the flue gas can not meet the required cooling capacity by air-conditioning, then after burning system is started to supply additional portion of fuel into the combustion chamber of absorption chiller/heater.



Application Features

◆Gas turbine generator is based on simple cycle, which improves waste heat utilization rate.

◆Flue gas from gas turbine is used in flue gas operated lithium bromide absorption chiller/heater with after burner, which can simplify system configuration, save equipment investment, and improve the energy integrated utilization in system.

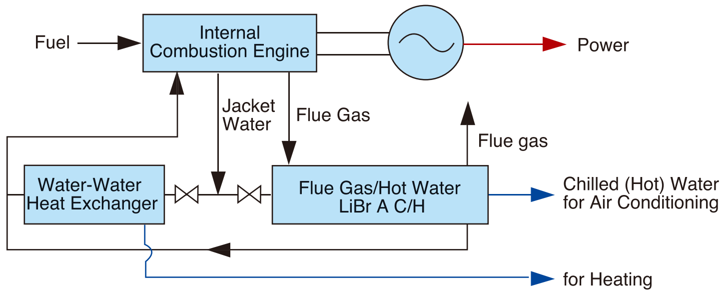
◆Installation of flue gas operated lithium bromide absorption chiller with after burner provides users with rational configuration according to their need for power, cooling and heating.

◆This mode is applicable to the trigeneration system with gas turbine generator.

◆Mode 3: Internal Combustion Engine +Flue Gas/Hot Water Operated Lithium Bromide Absorption Chiller/Heater

Working Principle

Fuel is burned in the engine combustion chamber to produce mechanical power for driving generator. High temperature flue gas and jacket hot water directly goes into lithium bromide absorption chiller/heaters to offer chilled (hot) water for air conditioning. Circulating jacket water directly enters water-water heat exchanger to supply heating when the system is running.



Application Features

◆Internal combustion engine flue gas and jacket water can be used directly to operate flue gas/hot water operated absorption chiller to simplify system configuration, reduce equipment investment and improve the system integrated energy utilization.

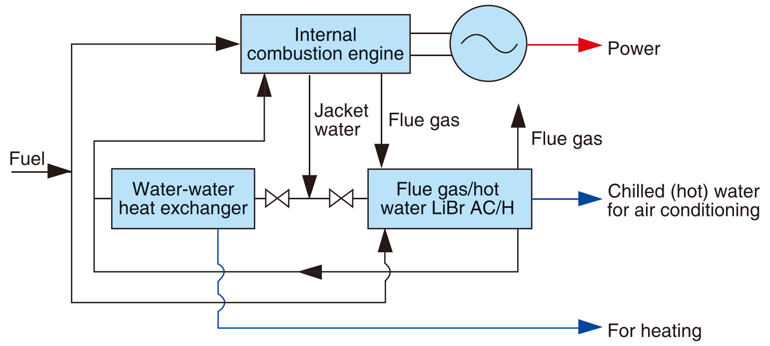
◆This mode is applicable to the trigeneration system with internal combustion engine driven generators.

◆Mode 4: Internal Combustion Engine + Flue Gas／Hot Water Operated Absorption Chiller／Heater with after Burning

Working Principle

Fuel is burned in the engine combustion chamber to produce mechanical power for driving generator. High temperature flue gas and jacket hot water from engine is directed to lithium bromide absorption chiller/heater with after burning to offer chilled (hot) water for air conditioning.

Circulating jacket water from engine is directed to water-water heat exchanger to supply heating when the system is running.



Application Features

◆Flue gas and jacket water of internal combustion engine can be directly used to operate flue gas/hot water operated absorption chiller with after burner to simplify system configuration, reduce equipment investment and improve the system integrated energy utilization.

◆Installation of flue gas operated lithium bromide absorption chiller with after burner provides users with rational configuration according to their need for power, cooling and heating.

◆This mode is applicable to the trigeneration system with internal combustion engine driven generators.

Description of Different Types of Flue Gas Operated Lithium Bromide Absorption Chiller / Heater and Applications

Type	Flue Gas Type	Flue Gas Type with after Burning	Flue Gas/Hot Water Type	Flue Gas/Hot Water Type with after Burning
Function	Cooling/Heating	Cooling/Heating	Cooling/Heating	Cooling/Heating
Cooling Capacity	99~1000USRT	99~1000USRT	99~2646USRT	99~2646USRT
Heat Source	High Temperature Flue Gas	High Temperature Flue Gas, Gas (Oil)	High Temperature Flue Gas, Hot Water	High Temperature Flue Gas, Hot Water, Gas (Oil)
Heat High Temperature Flue Gas, Hot Water, Gas (Oil)	Flue Gas Temp.≥250℃	Flue Gas Temp.≥250℃ Natural Gas, LPG, City Gas, Light/ Heavy Fuel Oil	Flue Gas Temp.≥250℃ Hot Water Temp.≥90℃	Flue Gas Temp.≥250℃ Hot Water Temp.≥90℃ Natural Gas, LPG, City Gas, Light/ Heavy Fuel Oil
Applications	Places, where high temp. flue gas (with low content of sulphur and foreign matter) is available and air conditioning is necessary.	Places, where high temp. flue gas (with low content of sulphur and foreign matter) is available and air conditioning is necessary.	Places, where high temp. flue gas(with low content of sulphur and foreign matter) and hot water is available and air conditioning is necessary.	Places, where high temp. flue gas (with low content of sulphur and foreign matter) is available.
Application Features	Applied mainly for trigeneration system with gas turbine (including micro turbine), internal combustion engine, fuel cell , also can be used for cooling (heating) by high temperature flue gas (such as flue gas of industrial kilns)	Applied mainly for trigeneration system with gas turbine (including micro turbine), internal combustion engine, fuel cell , also can be used for cooling (heating) by high temperature flue gas (such as flue gas of industrial kilns)	Applied mainly for trigeneration system with internal combustion engine as generator drive, also can be used for cooling (heating) by high temperature flue gas (such as flue gas of industrial kilns) and waste hot water	Applied for gas turbine generator plant, micro-turbo generators, and internal and external combustion engine generators

Note

For flue gas type, chiller/heater larger than1653RT, non-standard design is available if requested.

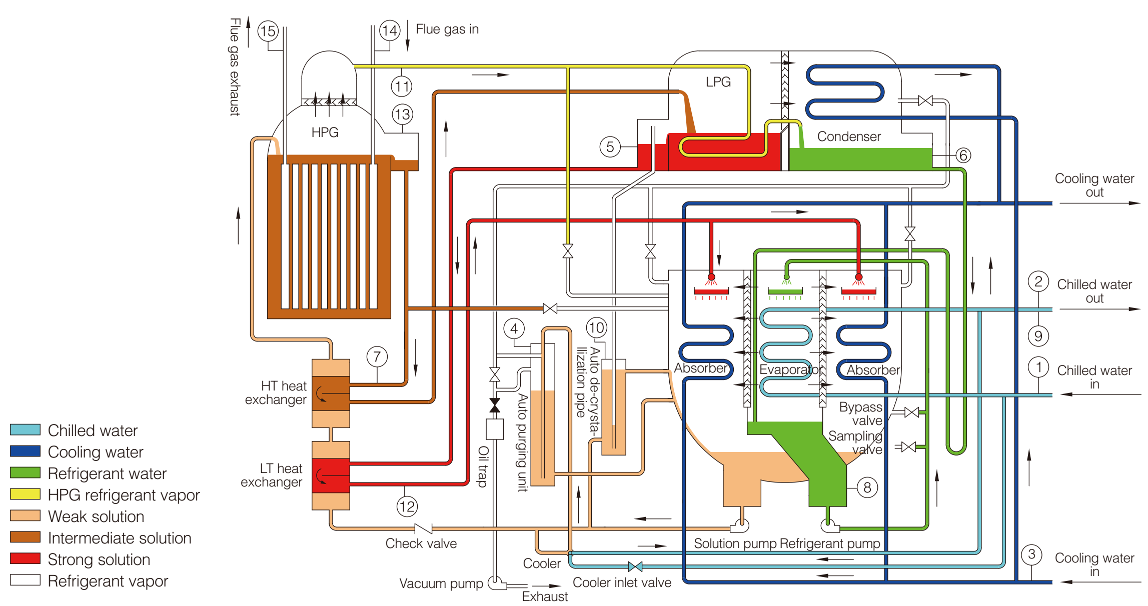
Flue Gas Operated Absorption Chiller/Heater

The maximum design capacity is 3300 USRT, flue gas inlet temp. shall be higher than or equal to 250℃. While having qualified back pressure, flue gas shall be clean and corrosion-free. Induct fan shall be introduced into the system if such back pressure is not sufficient. Flue gas inlet/outlet temp. of standard units is 430-520℃/170℃. The inlet/outlet temp. of chilled water, hot water and cooling water are respectively 12/7℃, 56/60℃ and 32/38℃. For more details and other applications, please consult with Shuangliang Technical Dept.

Working Principle

◆Cooling Cycle and Features

Flue gas operated lithium bromide absorption chiller/heater uses high temperature flue gas exhausted by gas turbine installation as fuel, water as refrigerant and lithium bromide solution as absorbent to produce chilled and/or hot water for air-conditioning and process. It consists of flue gas high pressure generator (HP generator), low pressure generator (LP generator), condenser, evaporator, absorber, high temperature heat exchanger (HT heat exchanger), low temperature heat exchanger (LT heat exchanger); and such auxiliary parts, as hermetically-sealed pumps and vacuum pump. It is kept under vacuum by vacuum pump and auto purging unit.



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto purging unit pressure (I)
⑤ Strong solution temp. in LPG (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG. (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ De-crystallization pipe temp. (I,A)
⑪ HPG pressure (C,I,A)
⑫ Strong solution spraying temp. (C,I)
⑬ Solution level of HPG (C,I)
⑭ Flue gas inlet temp. (I)
⑮ Flue gas exhausted temp. (I)

(A)—Alarm
(I)—Indication
(C)—Control

Flue Gas Operated Lithium Bromide Absorption Chiller/Heater

Evaporator

Chilled water (about 12℃) enters heat transfer tubes, and evaporates refrigerant water which is dripped over the tubes. The produced chilled water (about 7℃) goes into external system. Refrigerant water absorbs heat from external system, becomes water vapor, and flows into absorber.

Absorber

Lithium bromide strong solution with tremendous water vapor absorbing capacity drips over tubes, absorbs refrigerant vapor from evaporator, and becomes weak solution. Cooling water from cooling tower enters the heat transfer tubes to cool the strong solution distributed outside tubes, and carries away heat from external system. After absorbing water vapor, solution is diluted and sent to HPG through heat exchangers.

Flue Gas High Pressure Generator (HPG)

Flue gas is used to heat and boil the weak solution in HPG. The weak solution is concentrated into intermediate solution, which flows into LPG through HT heat exchanger. The high temperature refrigerant vapor produced in HPG enters LPG.

Low Pressure Generator (LPG)

Intermediate solution from HPG goes into LPG via HT heat exchanger, which is heated by refrigerant vapor and concentrated into strong solution. The strong solution flows into absorber through LT heat exchanger. At the same time, refrigerant vapor from HPG becomes condensate in LPG and enters condenser.

Condenser:

Cooling water flows through tubes in condenser and condenses the vapor outside the tubes into refrigerant water. The produced refrigerant water enters evaporator through U pipe for refrigeration.

Low Temperature Heat Exchanger (LT Heat Exchanger)

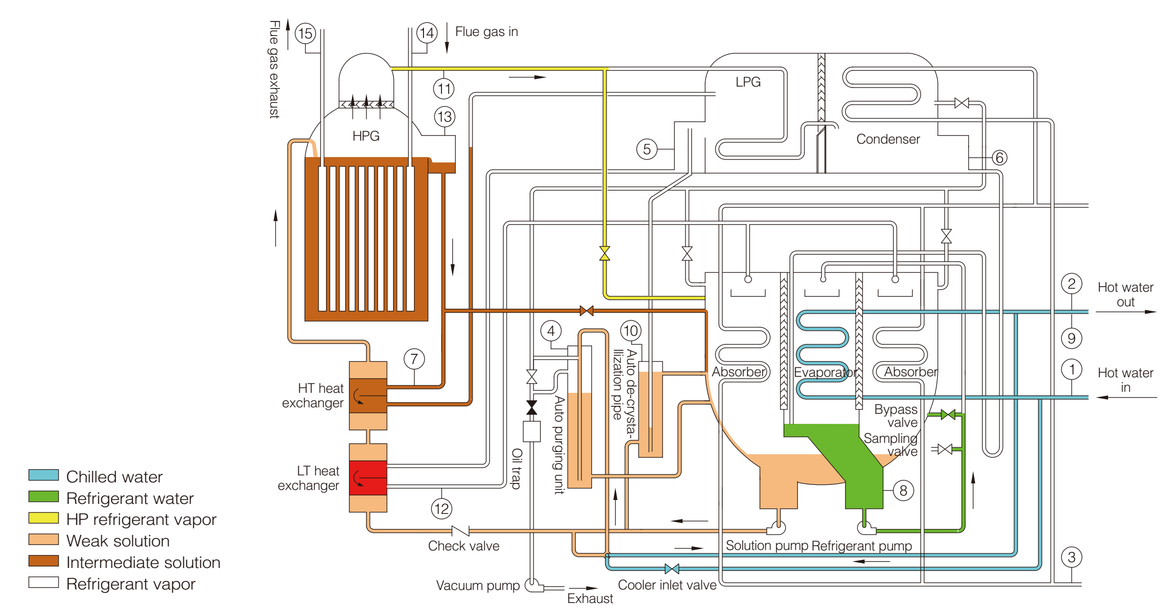
Strong solution from LPG exchanges heat with that of weak solution from absorber to raise the temperature of weak solution and recover heat from strong solution.

High Temperature Heat Exchanger (HT Heat Exchanger)

Intermediate solution from HPG exchanges heat with that of weak solution from LT heat exchanger to further raise the temperature of weak solution.

Heat exchangers reduce the heat requirements of HPG and the cooling water requirements. Performance of heat exchangers is critical.

Heating Cycle



① Hot water inlet tem. (I)
② Hot water outlet temp. (C,I,A)
④ Auto purging unit pressure (I)
⑦ Intermediate solution temp. in HPG (I,A)
⑨ Hot water flow (A)
⑪ HPG pressure (C,I,A)
⑬ Solution level of HPG (C,I)
⑭ Flue gas inlet temp. (I)
⑮ Flue gas exhausted temp. (I)

(A)—Alarm
(I)—Indication
(C)—Control

Technical Parameters

◆Flue Gas Operated Absorption Chiller/Heater

Type		YX480-	35H2	47H2	58H2	70H2	81H2	93H2	105H2	116H2	145H2	174H2
Cooling Capacity		kW	350	470	580	700	810	930	1050	1160	1450	1740
		10^4kcal/h	30	40	50	60	70	80	90	100	125	150
		USRt	99	132	165	198	231	265	298	331	413	496
Heating Capacity		10^4kcal/h	24	32	40	48	56	64	72	80	100	120
Chilled/Hot Water	Chilled Water In/Out Temp	℃	12 → 7									
	Hot Water In/Out Temp	℃	56 → 60									
	Flow	m^3/h	60	80	100	120	140	160	180	200	250	300
	Pressure Loss	mH_2O	4.5	4.5	5	6	5.5	6.5	9	9	4	4
	Connection Diameter (DN)	mm	100	100	125	125	150	150	150	150	200	200
Cooling Water	In/Out Temp	℃	32 → 38									
	Flow	m^3/h	86	114	143	172	200	229	257	286	357	429
	Pressure Loss	mH_2O	7	6.5	6.5	7	8	9	5.5	5.5	7.0	7.0
	Connection Diameter (DN)	mm	100	125	150	150	150	150	200	200	200	250
Flue Gas	Flow	kg/h	2745	3655	4570	5485	6400	7310	8225	9140	11425	13710
	Pressure Loss	mmH_2O	70	110	90	120	130	140	160	160	150	160
	Inlet Diameter (Φ)	mm	250	300	350	350	400	400	450	450	500	600
	Outlet Diameter (Φ)	mm	250	300	350	350	400	400	450	450	500	600
Electric Power	Power Supply		3Φ - 380V - 50Hz									
	Total Current	A	12.6	13.7	13.7	16.8	16.8	16.8	17.4	19.2	19.8	19.8
	Electric Power	kW	3.8	4.2	4.2	5	5	5	5.2	5.5	5.9	5.9
Overall Dimensions	Length	mm	3800	3820	3808	3820	3840	3840	4340	4340	4810	4885
	Width		2296	2406	2606	2716	2861	2871	2911	3021	3338	3615
	Height		2332	2351	2349	2411	2496	2544	2564	2807	2897	3034
Shipping Weight		t	7.2	8.3	9.8	10.5	11.4	12.5	13.8	14.2	17.1	19.6
Operation Weight			8.2	9.6	11.6	12.7	14.2	15.6	17.5	18.4	23	26.4

Note

(1) Values for chilled water,hot water,cooling water in the table above are based on nominal operation conditions,and can be adjusted in actual operation.

(2) The lowest outlet temp.for chilled water is 5℃. and inlet temp of cooling water can be adjusted in the range of 18~34℃.

(3) Flow of chilled/hot water can be adjusted in the range of 60~120%.

(4) Fouling factor of chilled/hot/cooling water is 0.086m^2K/kw(0.0001m^2·h·℃/kcal).

(5) Cooling capacity can be adjusted in the range of 20~100%.

(6) Flue gas temperature for models mentioned in the sheet is 480℃.

◆Flue Gas Operated Absorption Chiller/Heater

Type		YX480-	204H2	233H2	262H2	291H2	349H2	407H2	465H2	523H2	582H2
Cooling Capacity		kW	2040	2330	2620	2910	3490	4070	4650	5230	5820
		10^4kcal/h	175	200	225	250	300	350	400	450	500
		USRt	579	661	744	827	992	1157	1323	1488	1653
Heating Capacity		10^4kcal/h	140	160	180	200	240	280	320	360	400
Chilled/Hot Water	Chilled Water In/Out Temp	℃	12 → 7								
	Hot Water In/Out Temp	℃	56 → 60								
	Flow	m^3/h	350	400	450	500	600	700	800	900	1000
	Pressure Loss	mH_2O	4	5	6.5	6.5	8.5	8	9	12.5	12
	Connection Diameter (DN)	mm	200	250	250	250	300	300	350	350	350
Cooling Water	In/Out Temp	℃	32 → 38								
	Flow	m^3/h	500	572	643	715	857	1000	1143	1286	1429
	Pressure Loss	mH_2O	7	9	10	9.0	11.5	11	5.5	6.5	7
	Connection Diameter (DN)	mm	250	250	250	300	350	350	400	400	400
Flue Gas	Flow	kg/h	15990	18280	20560	22850	27410	31980	36550	41120	45690
	Pressure Loss	mmH_2O	160	160	180	160	170	170	160	155	160
	Inlet Diameter (Φ)	mm	600	700	700	700	800	900	900	1000	1000
	Outlet Diameter (Φ)	mm	600	700	700	700	800	900	900	1000	1000
Electric Power	Power Supply		3Φ - 380V - 50Hz								
	Total Current	A	19.8	21.7	26	26.9	31.8	33.5	36.5	36.5	42.3
	Electric Power	kW	5.9	6.9	7.9	7.9	9.6	10.1	11.1	11.1	12.6
Overall Dimensions	Length	mm	4885	5308	5733	5958	7230	7230	7230	7930	7960
	Width		3825	3785	3925	4010	4437	4712	5022	5132	5559
	Height		3150	3280	3320	3470	3760	4060	4240	4420	4570
Shipping Weight		t	22.1	24.7	25.9	31.1	38.1	44.3	48.7	52.7	60.5
Operation Weight			29.4	33.7	36	42	52.3	60.1	66.3	72	82.4

Note

(1) Values for chilled water,hot water,cooling water in the above table are for nominal operation conditions,and can be properly adjusted in actual operation.

(2) The lowest outlet temp.for chilled water is 5℃. Inlet temp of cooling water can be adjusted in the range of 18~34℃.

(3) Flow of chilled/hot water can be adjusted in the range of 60~120%.

(4) Fouling factor on chilled/hot/cooling water side is 0.086m^2K/kw(0.0001m^2·h·℃/kcal).

(5) Cooling capacity can be adjusted in the range of 20~100%.

(6) Flue gas temperature for models mentioned in the sheet is 480℃.

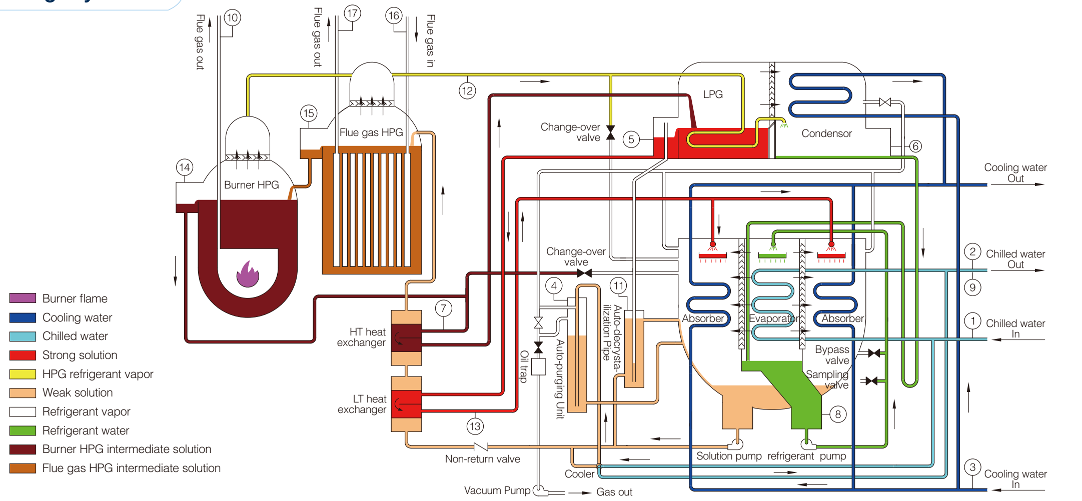
Flue Gas Operated Lithium Bromide Absorption Chiller/Heater

Flue Gas with Direct-Fired After Burning Type Lithium Bromide Absorption Chiller/Heater

Flue gas inlet temp. shall be higher than or equal to 250℃. While having qualified back pressure, flue gas shall be clean and corrosion-free. Induct fan shall be introduced into the system if such back pressure is not sufficient. After burning fuel can be oil (light diesel oil) or gas (NG, city gas etc). Flue gas inlet/outlet temp. of standard units is 430-520℃/170℃. By using split structure, after burning capacity can compensate up to 100% of nominal load capacity. The inlet/outlet temp. of chilled water, hot water and cooling water are respectively 12/7℃, 56/60℃ and 32/38℃. Cooling capacity: 350-5820kw.

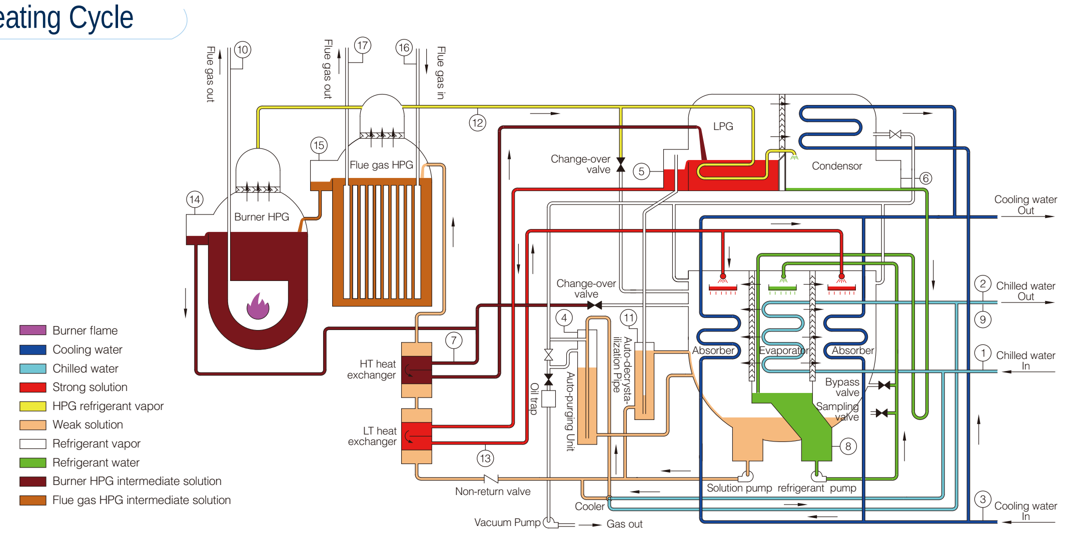
For more details and other applications, please consult with Shuangliang Technical Dept.

Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto-purging unit pressure (I)
⑤ Solution temp. in LPG (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ Burner flue temp. (I,A)
⑪ Auto-decrystallization pipe temp. (I,A)
⑫ HPG pressure (C,I,A)
⑬ Strong solution spray temp. (C,I)
⑭ Solution level in burner HPG (C,I)
⑮ Solution level in flue gas HPG (C,I)
⑯ Flue gas inlet temp. (I)
⑰ Gas flue out temp. (I)
(I)–Display
(C)–Control
(A)–Alarm

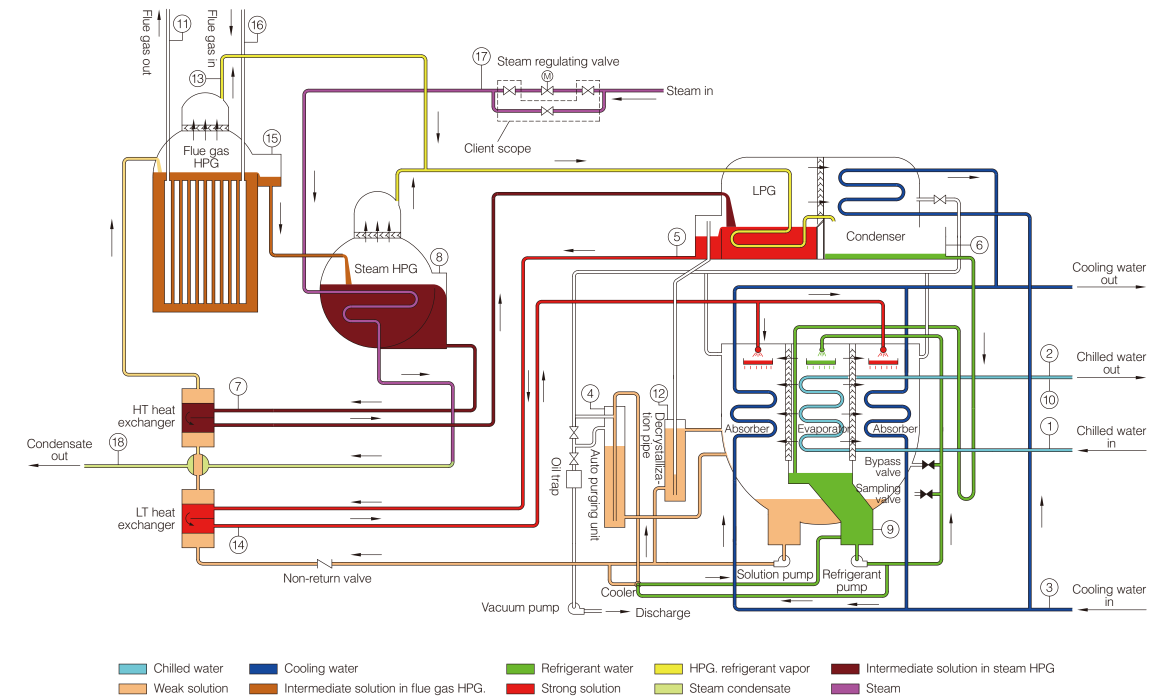
Heating Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto-purging unit pressure (I)
⑤ Solution temp. in LPG (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ Burner flue temp. (I,A)
⑪ Auto-decrystallization pipe temp. (I,A)
⑫ HPG pressure (C,I,A)
⑬ Strong solution spray temp. (C,I)
⑭ Solution level in burner HPG (C,I)
⑮ Solution level in flue gas HPG (C,I)
⑯ Flue gas inlet temp. (I)
⑰ Gas flue out temp. (I)
(I)–Display
(C)–Control
(A)–Alarm

Flue Gas/Steam Operated Lithium Bromide Absorption Chiller

Flue gas inlet temp. shall be higher than or equal to 250℃. While having qualified back pressure, flue gas shall be clean and corrosion-free. Induct fan shall be introduced into the system if such back pressure is not sufficient. Flue gas outlet temp. and steam pressure of standard units are 170℃ and 0.4-0.8MPa. The inlet/outlet temp. of chilled water and cooling water are respectively 12/7℃, and 32/38℃. cooling water inlet/outlet temp. 32℃/38℃. For more details and other applications, please consult with Shuangliang Technical Dept.Please consult with our technical dept. for details and other applications.



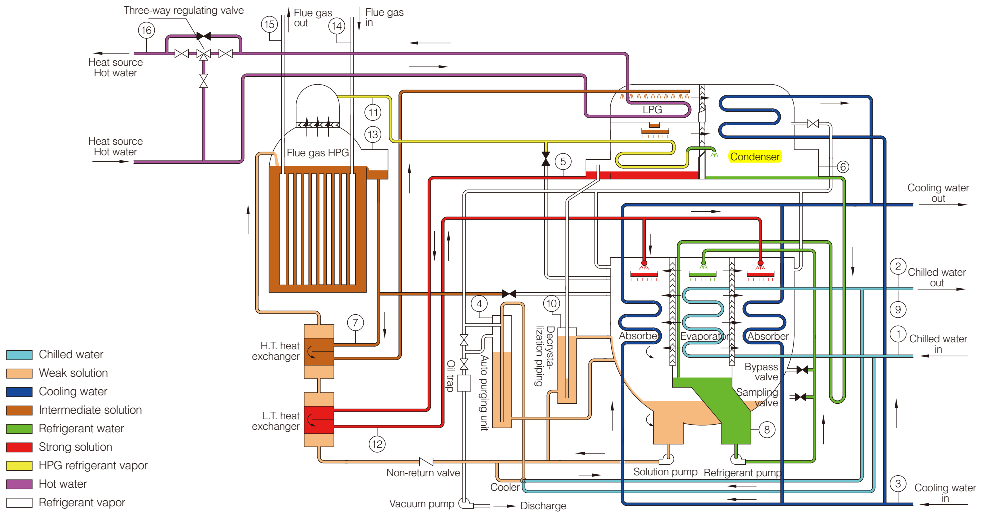
① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Purging unit pressure (I)
⑤ Strong solution temp.in LPG (C,I)
⑥ Condensation Temp. (I,A)
⑦ Intermediate solution temp.(I,A)
⑧ Solution level in steam HPG (C,I)
⑨ Evaporation temp. (I,A)
⑩ Chilled water flow (A)
⑪ Flue gas outlet temp. (I)
⑫ Decrystallization pipe temp. (I,A)
⑬ Pressure in HPG (C,I,A)
⑭ Strong solution spraying temp (C,I)
⑮ Solution level in flue gas HPG (C,I)
⑯ Flue gas inlet temp. (I)
⑰ Steam pressure (C,I,A)
⑱ Steam condensate temp. (I)
(C)—Control
(A)—Alarm
(I)—Indication

Flue Gas/Hot Water Operated Lithium Bromide Absorption Chiller/Heater

Flue gas inlet temp. shall be higher than or equal to 250℃. While having qualified back pressure, flue gas shall be clean and corrosion-free. Induct fan shall be introduced into the system if such back pressure is not sufficient. Hot water inlet temp. ≥90℃, chilled water outlet temp. ≥7℃, cooling water inlet/outlet temp. 28℃/34℃. Cooling capacity for single unit: 350-3490 kw.

For more details and other applications, please consult with Shuangliang Technical Dept.

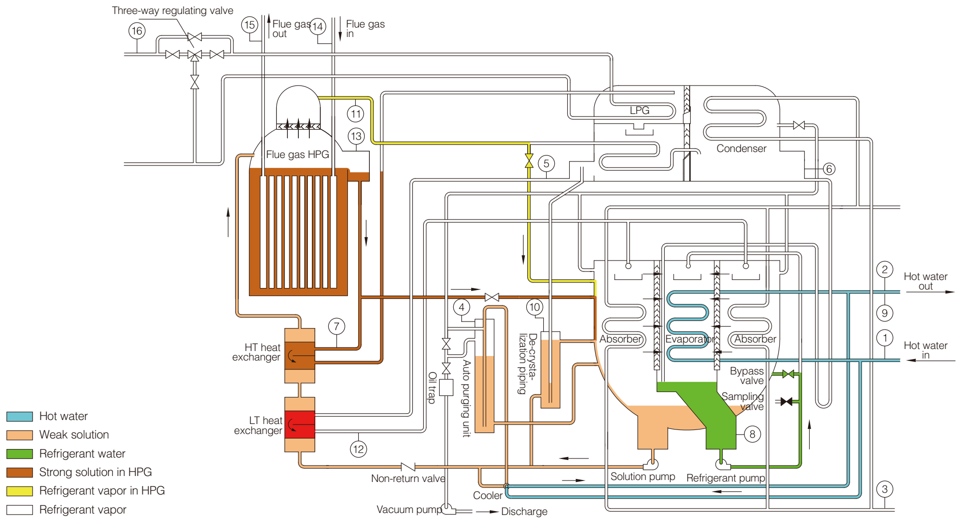
Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water out temp. (C,I,A)
③ Cooling water inlet temp.(C,I,A)
④ Puring unit pressure(I)
⑤ Strong solution temp. in LPG (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp.in HPG (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ Decrystalizaton piping temp. (I,A)
⑪ Pressure in HPG (C,I,A)
⑫ Strong solution spraying temp. (C,I)
⑬ Solution level in HPG (C,I)
⑭ Flue gas inlet temp. (I)
⑮ Flue gas outlet temp. (I)
⑯ Heat source hot water outlet temp. (C,I)

(A)–Alarm
(I)–Display
(C)–Control

Heating Cycle



① Hot water inlet temp. (I)
② Hot water outlet temp. (C,I,A)
④ Puring unit pressure(I)
⑦ Strong solution temp. in HPG (I,A)
⑨ Hot water flow rate (A)
⑪ Pressure in HPG (C,I,A)
⑬ Solution level in HPG (C,I)
⑭ Flue gas inlet temp. (I)
⑮ Flue gas outlet temp. (I)

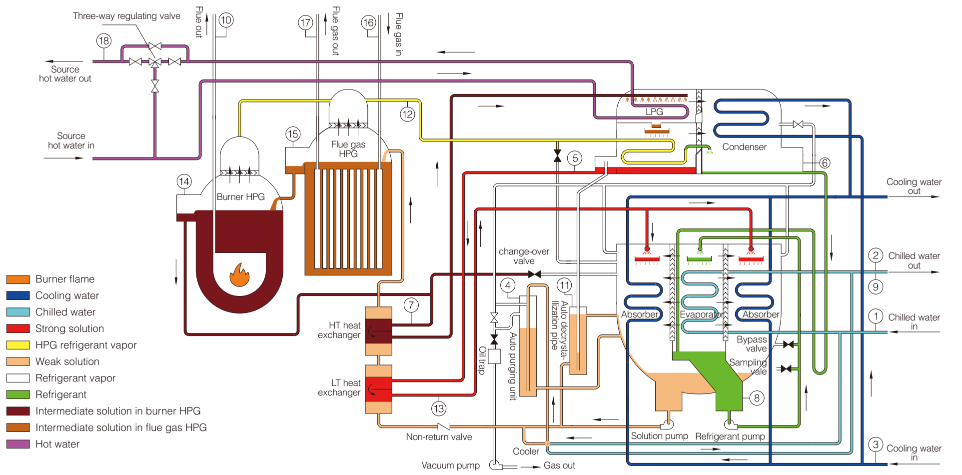
(A)–Alarm
(I)–Display
(C)–Control

Flue Gas/Hot Water with Direct-Fired after Burning Type Lithium Bromide Absorption Chiller/Heater

Flue gas inlet temp. shall be greater than or equal to 250℃. While having qualified back pressure, flue gas shall be clean and corrosion-free. Induct fan shall be introduced into the system if such back pressure is not sufficient. After burning fuel can be oil (light diesel oil) or gas (NG, city gas etc). Hot water returning temp. ≥92℃ (hot water inlet temp. ≥98℃), chilled water outlet temp. ≥7℃, cooling water inlet/outlet temp. 28℃/34℃. Cooling capacity for single unit: 350-3490 kw.

For more details and other applications, please consult with Shuangliang Technical Dept.

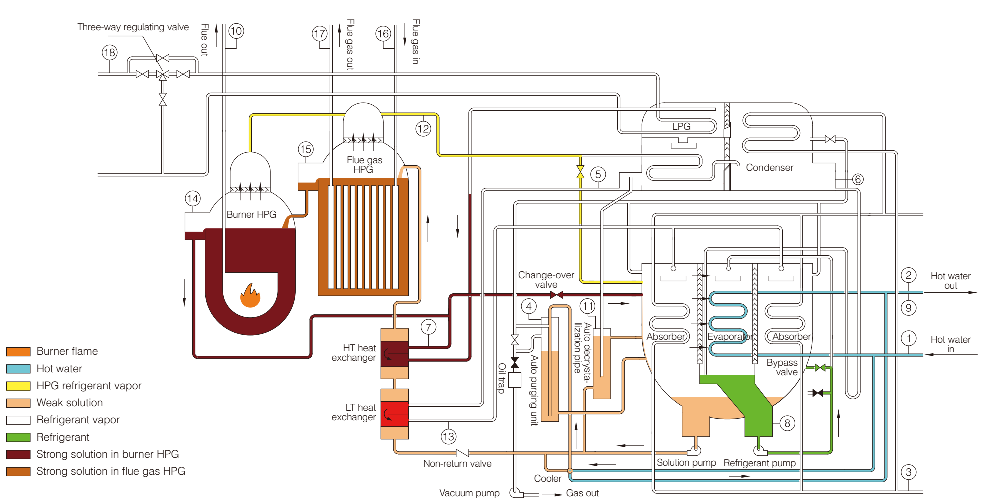
Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Purge unit pressure (I)
⑤ Strong solution temp. in LPG. (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in burner HPG (I,A)
⑧ Evaporation (I,A)
⑨ Chilled water flow rate (A)
⑩ Burner flue out temp. (I,A)
⑪ Decrystallization pipe temp. (I,A)
⑫ HPG pressure (C,I,A)
⑬ Strong solution spray temp. (C,I)
⑭ Solution level in burner HPG (C,I)
⑮ Solution level in flue gas HPG.(C,I)
⑯ Flue gas inlet temp. (I)
⑰ flue gas out temp. (I)
⑱ Source hot water out temp. (C,I)

(I)–Display
(C)–Control
(A)–Alarm

Heating Cycle



① Hot water inlet temp. (I)
② Hot water outlet temp. (C,I,A)
④ Purging unit pressure (I)
⑦ Intermediate solution temp. in burner HPG (I,A)
⑨ Hot water flow (A)
⑩ Burner flue outlet temp. (I,A)
⑫ HPG pressure (C,I,A)
⑭ Solution level of burner HPG (C,I)
⑮ Solution level of flue gas HPG (C,I)
⑯ Flue gas inlet temp. (I)
⑰ Flue gas outlet temp. (I)

(I)–Display
(C)–Control
(A)–Alarm

2

Direct-Fired Lithium Bromide Absorption Chiller/Heater

Three types are available:

H2 direct-fired chiller/heater (COP: 1.34)

H3 direct-fired chiller/heater (COP: 1.25)

H3D direct-fired chiller/heater (COP: 1.365)

Direct-fired lithium bromide absorption chiller/heater is a kind of large-size industrial unit for heating or cooling, using gas (natural gas, city gas, or LPG) or oil (diesel oil) as the driving energy (with only limited electricity as auxiliary power), lithium bromide solution as the absorbent and water as refrigerant.

It is suitable in regions where there are cheap natural gas resources, not only reduces greatly the cost for electricity, but also compensates the peak-valley load difference. When the hot summer rolls in, shortage of electric power will poses great concerns for various cities. Concentrated consumption of power caused by the use of air conditioners is the sticking point for such a seasonal problem, for which, direct-fired chiller/heater offers an attractive solution.

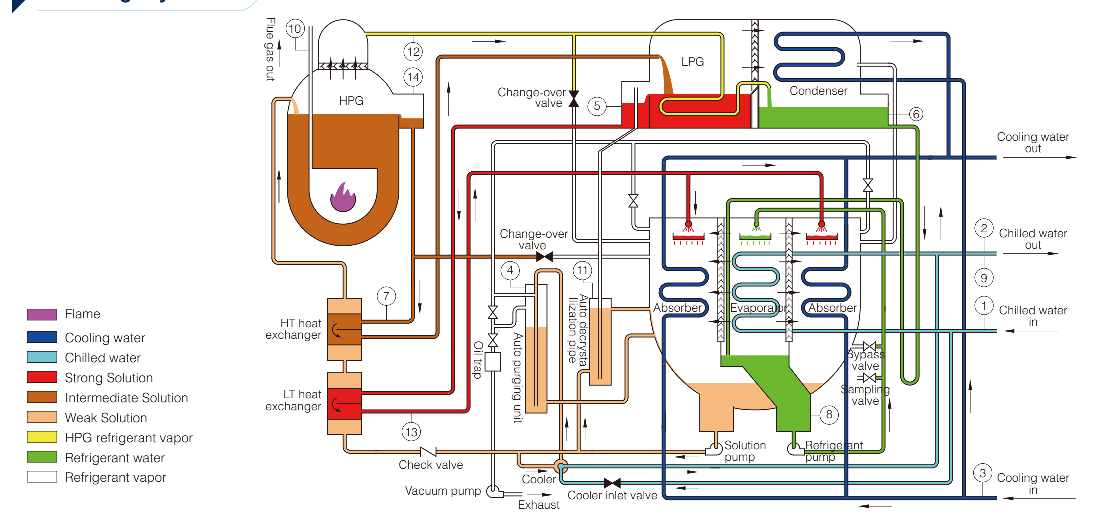
The most attractive feature is its stunning performance in energy-saving. Shuangliang direct fired chiller/heater are widely applied in such as precision machinery manufacturing, instruments & meters, aviation & aerospace, textiles, electronics, electric power, metallurgy, pharmaceuticals, cigarettes, chemicals, hospitals, food, etc. By utilizing dozens of patented technologies that are extremely efficient and environmentally friendly, with over 30 years of customer service experience, Shuangliang guarantees to reward users with optimal returns.

Working Principle and Performance Parameters

This direct-fired absorption chiller/heater is operated by heat from fuel or gas burner,with LiBr solution as absorbent and water as refrigerant. It consists of high pressure generator, low pressure generator, condenser, evaporator, absorber, high and low temperature heat exchangers, canned motor vacuum pumps, and two shell and tube heat exchangers. It is kept under vacuum by vacuum pump and auto-purging unit.

General Flow Chart

Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto-purging unit pressure (I)
⑤ Strong solution temp. in LPG. (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG. (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ Flue gas exit temp. (I,A)
⑪ De-crystallization pipe temp. (I,A)
⑫ HPG pressure (C,I,A)
⑬ HPG pressure (C,I,A)
⑭ Solution level of HPG (C,I)
(I)--Indication
(C)--Control
(A)--Alarm

Special Features of Cooling Cycle

Evaporator

Chilled water (about 12℃) enters heat transfer tubes and evaporates refrigerant water which is dripped over the tubes. The produced chilled water (about 7℃) goes into the external system. Refrigerant water absorbs heat from external system, becomes vapor and flows into absorber.

Absorber

Strong solution drips over tubes, absorbing refrigerant vapor from evaporator and becoming weak solution. Cooling water from cooling tower enters heat transfer tubes to cool the strong solution distributed tubes and carries away heat from external system. After absorbing vapor, solution is diluted and sent into HPG through heat exchangers.

High Pressure Generator (hereinafter HPG)

The weak solution is concentrated into intermediate solution, which flows into LPG through HT heat exchange. The high temperature refrigerant vapor produced in HPG enters LPG.

Low Pressure Generator (hereinafter LPG)

Intermediate solution from HPG goes into LPG via HT heat exchanger, which is heated by refrigerant vapor and concentrated into strong solution. The strong solution flows into absorber through LT heat exchanger. At the same time, refrigerant vapor from HPG becomes condensate in LPG and enters condenser.

Direct-Fired Lithium Bromide Absorption Chiller/Heater

Condenser

Cooling water flows through tubes in condenser and condenses the vapor outside the tubes into refrigerant water. The produced refrigerant water enters evaporator through U pipe for cooling.

LT Heat Exchanger

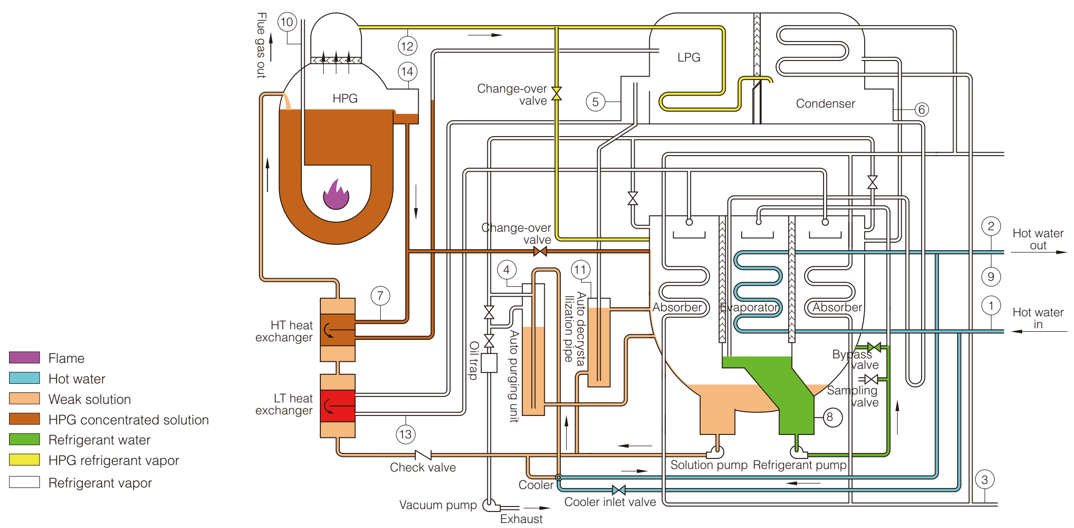
Strong solution from LPG exchanges heat with that of weak solution from absorber to raise the temperature of weak solution and recover heat from strong solution.

HT Heat Exchanger

Intermediate solution from HPG exchanges heat with that of weak solution from LT heat exchanger to further raise the temperature of weak solution.

Heat exchangers reduce the heat requirements of HPG and the cooling water requirements. Performance of heat exchangers is critical for efficiency of chiller/heater.

Heating Cycle



① Hot water inlet temp. (I)
② Hot water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto-purging unit pressure (I)
⑤ Strong solution temp. in LPG. (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG. (I,A)
⑧ Evaporation temp. (I,A)
⑨ Hot water flow (A)
⑩ Flue gas exit temp. (I,A)
⑪ De-crystallization pipe temp. (I,A)
⑫ HPG pressure (C,I,A)
⑬ Strong soltuion spray temp. (C,I)
⑭ Solution level of HPG. (C,I)
(I)--Indication
(C)--Control
(A)--Alarm

Special Features of Heating Cycle

Solution in HPG is heated to produce vapor, which is led to the evaporator to heat the hot water in tubes. The weak solution, which is formed by mixing strong solution with refrigerant water, is pumped to HPG to repeat the heating circulation. When switching from cooling to heating mode, two change-over valves (see flow chart) shall be opened simultaneously, cooling water and refrigerant pumps shall be shut down.

Technical Parameters

◆H2 Type Direct-Fired Lithium Bromide Absorption Chiller

Model				DF-	99H2	132H2	165H2	198H2	231H2	265H2	298H2	331H2	413H2	496H2	579H2
Cooling Capacity				kW	349	465	582	698	814	930	1047	1163	1454	1745	2035
				10^4kcal/h	30	40	50	60	70	80	90	100	125	150	175
				USRt	99	132	165	198	231	265	298	331	413	496	579
Heating Capacity				kW	279	372	465	558	651	744	837	930	1163	1396	1628
				10^4kcal/h	24	32	40	48	56	64	72	80	100	120	140
Chilled/ Hot Water	Inlet/Outlet Temp.(Chilled Water)			℃	12 → 7										
	Inlet/Outlet Temp.(Heated Water)			℃	56 → 60 (50 → 60)										
	Flow Rate			m^3/h	60(24)	80(32)	100(40)	120(48)	140(56)	160(64)	180(72)	200(80)	250(100)	300(120)	350(140)
	Pressure Loss			mH_2O	4.4(0.7)	4.5(0.8)	4.7(0.8)	5.7(1)	5.6(0.9)	6.2(1.0)	8.8(1.5)	8.8(1.5)	3.8(0.7)	3.8(0.7)	4.1(0.7)
	Connection Diameter(DN)			mm	100	100	125	125	150	150	150	150	200	200	200
Cooling Water	Inlet/Outlet Temp.			℃	32 → 38										
	Flow Rate			m^3/h	85	113	141	170	198	226	255	283	353	424	495
	Pressure Loss			mH_2O	6.5	6.2	6.4	6.9	7.5	7.7	5.3	5.3	7.1	6.6	6.8
	Connection Diameter(DN)			mm	100	125	150	150	150	150	200	200	200	250	250
Fuel	Natural Gas (11000kcal/Nm^3, density=0.64)	Consumption	Cooling	Nm^3/h	20.2	26.9	33.6	40.3	47.1	53.8	60.5	67.2	84	100.8	117.6
			Heating		23.3	31	38.8	46.5	54.3	62	69.8	77.5	96.9	116.3	135.7
		Inlet Pressure		kPa	15~50										
		Connection Diameter(G)		mm(in)	1.5''								2''		
	Light Oil (10400kcal/kg)	Consumption	Cooling	kg/h	21.3	28.5	35.6	42.7	49.8	56.9	64	71.1	88.9	106.7	124.4
			Heating		24.6	32.8	41	49.2	57.4	65.6	73.8	82	102.5	123	143.5
		Connection Diameter(G)		in	3/8''									1''	
Air Flow for Combustion(30℃)			Cooling	m^3/h	324	432	540	648	755	865	970	1080	1350	1620	1890
			Heating		372	496	620	744	868	992	1120	1240	1550	1860	2170
Exhaust Connection Dimension				mm	170×250	170×250	200×300	200×300	250×360	250×360	250×360	250×450	250×500	300×500	300×500
Electrical Data	Power Supply				3Φ - 380VAC - 50Hz										
	Total Current			A	15.8	17.2	16.7	20.7	20.7	21.8	22.4	25.1	28.6	35.6	35.6
	Electric Power			kW	4.4	4.9	5	6	6	6.4	6.6	7.3	8.5	11.8	11.8
Overall Dimensions	Length			mm	3780	3800	3810	3820	3840	3840	4340	4340	4810	4885	4885
	Width				1954	2113	2138	2282	2439	2449	2457	2615	2805	2966	3050
	Height				2332	2351	2349	2411	2496	2544	2564	2807	2897	3034	3150
Shipping Weight				t	6.6	7.7	8.8	9.4	10.2	10.9	11.7	11.9	13.8	16.2	18
Operating Weight					8.1	9.4	10.9	12	13.3	14.2	15.3	16	19.4	22.3	24.5

Note

(1) Values for chilled/heated/cooling water in table above are based on nominal conditions and can be adjusted in actual operation.

(2) The lowest outlet temperature of chilled water is 5℃

(3) Chilled/Heated water can be adjusted in the range of 60~120%.

(4) Scale factor of chilled/heated/cooling water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(5) Cooling/Heating capacity can be adjusted in the range of 30~105% for oil-fired type, 25~105% for gas-fired type.

(6) Nominal discharge temperature of flue gas: 170℃ for cooling mode, 155℃ for heating mode.

Technical Parameters

◆H2 Type Direct-Fired Lithium Bromide Absorption Chiller

Model				DF-	661H2	744H2	827H2	992H2	1157H2	1323H2	1488H2	1653H2	1984H2	2646H2	3307H2
Cooling Capacity				kW	2326	2617	2908	3489	4071	4652	5234	5815	6978	9304	11630
				10^4kcal/h	200	225	250	300	350	400	450	500	600	800	1000
				USRt	661	744	827	992	1157	1323	1488	1653	1984	2646	3307
Heating Capacity				kW	1861	2093	2326	2791	3256	3722	4187	4652	5582	7443	9304
				10^4kcal/h	160	180	200	240	280	320	360	400	480	640	800
Chilled/ Hot Water	Inlet/Outlet Temp.(Chilled Water)			℃	12 → 7										
	Inlet/Outlet Temp.(Heated Water)			℃	56 → 60 (50 → 60)										
	Flow Rate			m^3/h	400(160)	450(180)	500(200)	600(240)	700(280)	800(320)	900(360)	1000(400)	1200(480)	1600(640)	2000(800)
	Pressure Loss			mH$_2$O	4.9(0.8)	6.6(1.1)	6.4(1.1)	8.4(1.4)	8.1(1.3)	8.8(1.5)	12.4(2)	11.8(1.9)	2.6(0.5)	5.0(0.6)	7.5(1.1)
	Connection Diameter(DN)			mm	250	250	250	300	300	350	350	350	400	400	450
Cooling Water	Inlet/Outlet Temp.			℃	32 → 38										
	Flow Rate			m^3/h	565	636	707	848	989	1130	1272	1413	1696	2264	2830
	Pressure Loss			mH$_2$O	8.7	9.6	9.1	11.1	11	5.2	6.2	6.6	8.6	12	16
	Connection Diameter(DN)			mm	250	250	300	350	350	400	400	400	450	500	600
Fuel	Natural Gas (11000kcal/Nm^3, density=0.64)	Consumption	Cooling	Nm^3/h	134.4	151.3	168.1	201.7	235.3	268.9	302.5	336.1	403.3	537.6	672
			Heating		155.1	174.4	193.8	232.6	271.3	310.1	348.9	387.6	465.2	620	775
		Inlet Pressure		kPa	15~50										
		Connection Diameter(G)		mm(in)	2''			65			80		100	2-65	2-80
	Light Oil (10400kcal/kg)	Consumption	Cooling	kg/h	142.2	160	177.8	213.3	248.9	284.4	320	355.5	426.6	568.8	711
			Heating		164	184.5	205	246	287	328	369	410	492	656	820
		Connection Diameter(G)		in	1''									2-1''	
Air Flow for Combustion(30℃)			Cooling	m^3/h	2160	2430	2700	3240	3780	4320	4860	5400	6480	8850	11000
			Heating		2480	2790	3100	3720	4340	4960	5580	6200	7440	9950	12500
Exhaust Connection Dimension				mm	360×550	360×550	400×600	420×700	420×700	550×750	550×750	550×750	650×800	2-(550×750)	
Electrical Data	Power Supply				3Φ - 380VAC - 50Hz										
	Total Current			A	37.5	43.5	44.4	57.8	59.5	62.5	70.8	82.3	84.5	106.3	164.7
	Electric Power			kW	12.8	15.4	15.4	21.6	22.1	23.1	29.5	33.6	35.1	42.6	73.3
Overall Di-mensions	Length			mm	5308	5733	5960	7230	7230	7230	7930	7960	9190	9850	11550
	Width				3183	3357	3320	3851	4000	4220	4329	4607	4527	4960	5230
	Height				3218	3221	3320	3441	3720	3864	3864	4214	4224	5160	5180
Shipping Weight				t	20.6	21.8	25.8	30.8	35.1	39.8	43.2	50.5	57.2	77.0	89.0
Operating Weight					28.2	30.3	35.4	42.8	48.9	55.5	60	69.7	79.8	112	131.0

Note

(7) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(8) Heat values indicated in the table are low heat values, fuel consumption not indicated in the table above can be calculated = Low heat value indicated in the table/Low heat value of adopted fuel×consumption indicated in the table.

(9) Special order shall be placed if fuels are artificial coal gas, biogas, coal-bed gas, heavy oil, etc.

(10) Gas inlet pressure indicated in the table is the pressure at the outlet of ball valve when the chiller is in operation.

(11) Gas Relative Density = gas density/air density

(12) Overall dimensions indicated in the table include rack dimensions.

(13) The shipping weight includes the rack weight, and excludes the solution weight.

(14) When referring to chilled/heated Water sub-region, data indicated in the round brackets are parameters in heating mode with inlet/outlet temperature difference of 10℃.

Technical Parameters

◆H3 Type Direct-Fired Lithium Bromide Absorption Chiller

Model				DF-	99H3	132H3	165H3	198H3	231H3	265H3	298H3	331H3
Cooling Capacity				kW	349	465	582	698	814	930	1047	1163
				10^4kcal/h	30	40	50	60	70	80	90	100
				USRt	99	132	165	198	231	265	298	331
Heating Capacity				10^4kcal/h	24	32	40	48	56	64	72	80
Chilled/ Hot Water	Inlet/Outlet Temp.(Chilled Water)			℃	12 → 7							
	Inlet/Outlet Temp.(Heated Water)			℃	56 → 60 (50 → 60)							
	Flow Rate			m^3/h	60(24)	80(32)	100(40)	120(48)	140(56)	160(64)	180(72)	200(80)
	Pressure Loss			mH$_3$O	5.5(0.9)	5.5(0.9)	5.7(1)	6.8(1.1)	7.8(1.3)	7.3(1.2)	7.9(1.3)	10.9(1.8)
	Connection Diameter(DN)			mm	100	100	125	125	150	150	150	150
Cooling Water	Inlet/Outlet Temp.			℃	32 → 38							
	Flow Rate			m^3/h	87	116	145	174	203	232	261	290
	Pressure Loss			mH$_3$O	7.7	7.4	7.5	8.6	9.8	9.6	9.2	6.2
	Connection Diameter(DN)			mm	100	125	150	150	150	150	200	200
Fuel	Light Oil (10400kcal/kg)	Consumption	Cooling	kg/h	23.1	30.8	38.5	46.2	53.8	61.5	69.2	76.9
			Heating		24.6	32.8	41	49.2	57.4	65.6	73.8	82
		Connection Diameter (G)		in	3/8"							
	Natural Gas (11000kcal/Nm^3 Density=0.64)	Consumption	Cooling	Nm^3/h	21.8	29.1	36.4	43.6	50.9	58.2	65.5	72.7
			Heating		23.3	31	38.8	46.5	54.3	62	69.8	77.5
		Inlet Pressure		mmH$_3$O	15 ~ 50							
		Connection Diameter (G)		mm(in)	1.5"							
Air Flow for Combustion (30℃)			Cooling	m^3/h	348	464	581	700	810	930	1050	1165
			Heating		370	495	620	745	870	990	1120	1240
Exhaust Connection Dimension				mm	170×250	170×250	200×300	200×300	200×300	250×360	250×360	250×360
Electrical Data	Power Supply				3Φ - 380VAC - 50Hz							
	Total Current			A	15.8	17.2	16.7	18.5	20.7	21.8	21.8	22.4
	Electric Power			kW	4.4	4.9	5	5.6	6	6.4	6.4	6.6
Overall Dimen-sions	Length			mm	3780	3780	3806	3806	3850	3840	3910	4495
	Width				1954	2113	2138	2138	2282	2439	2449	2457
	Height				2333	2352	2349	2349	2411	2496	2544	2564
Shipping Weight				t	6.3	7.6	8.6	8.9	9.3	10.3	11	11.8
Operating Weight					7.7	9.3	10.7	11.3	12.3	13.5	14.6	15.9

Note

(1) Values for chilled/heated/cooling water in table above are based on nominal conditions and can be adjusted in actual operation.

(2) The lowest outlet temperature of chilled water is 5℃.

(3) Chilled/Heated water can be adjusted in the range of 60~120%.

(4) Scale factor of chilled/heated/cooling water is 0.086m^{2}K/kW (0.0001m^2·h·℃/kcal).

(5) Cooling/Heating capacity can be adjusted in the range of 30~105% for oil-fired type, 25~105% for gas-fired type.

(6) Nominal discharge temperature of flue gas: 190℃ for cooling mode, 175℃ for heating mode.

Direct-Fired Lithium Bromide Absorption Chiller/Heater

Technical Parameters

◆H3 Type Direct-Fired Lithium Bromide Absorption Chiller

413H3	496H3	579H3	661H3	744H3	827H3	992H3	1157H3	1323H3	1488H3	1653H3	1984H3
1454	1745	2035	2326	2617	2908	3489	4071	4652	5234	5815	6978
125	150	175	200	225	250	300	350	400	450	500	600
413	496	579	661	744	827	992	1157	1323	1488	1653	1984
100	120	140	160	180	200	240	280	320	360	400	480
12 → 7											
56 → 60 (50 → 60)											
250(100)	300(120)	350(140)	400(160)	450(180)	500(200)	600(240)	700(280)	800(320)	900(360)	1000(400)	1200(480)
4.1(0.7)	5.5(0.9)	5.2(0.9)	5.3(0.9)	6.1(1)	8.2(1.4)	9.2(1.5)	11.5(1.9)	10.5(1.7)	11.1(1.8)	10.6(1.7)	14.1(2.3)
200	200	200	250	250	250	300	300	350	350	350	400
32 → 38											
362.5	435	507.5	580	652.5	725	870	1015	1160	1305	1450	1740
7.7	8.6	8.3	9.0	10.4	11.1	12.5	14.7	13.9	14.3	14.6	17.2
200	250	250	250	250	300	350	350	400	400	400	450
96.2	115.4	134.6	153.8	173.1	192.3	230.8	269.2	307.7	346.2	384.6	461.5
102.5	123	143.5	164	184.5	205	246	287	328	369	410	492
3/8"	1"										
90.9	109.1	127.3	145.5	163.6	181.8	218.2	254.5	290.9	327.3	363.6	436.4
96.9	116.3	135.7	155.1	174.4	193.8	232.6	271.3	310.1	348.9	387.6	465.2
15 ~ 50											
2"						65					
1455	1745	2035	2325	2620	2911	3490	4070	4650	5230	5815	6980
1550	1860	2170	2480	2790	3100	3720	4340	4960	5580	6200	7440
250×450	250×500	300×500	300×500	360×550	360×550	400×600	420×700	420×700	550×750	550×750	600×800
3Φ - 380VAC - 50Hz											
28	35.6	35.6	36.6	39.2	43.5	54.5	57.8	59.5	70.8	82.3	84.5
8.1	11.8	11.8	12.4	14.4	15.4	20.9	21.6	22.1	29.5	33.6	35.1
4495	5100	5100	5110	5520	6045	6150	7230	7230	7230	7260	7960
2615	2805	2966	3050	3183	3357	3345	3810	4000	4220	4586	4700
2807	2897	3034	3150	3218	3221	3320	3441	3720	3864	4214	4314
12	14	16.5	18.2	20.9	22.2	26.2	31.3	35.3	40.2	45.1	54.2
16.7	19.8	22.8	25.2	29.1	31.3	37.8	43.5	50.2	56	63.9	74.8

Note

(7) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(8) Heat values indicated in the table are low heat values, fuel consumption not indicated in the table above can be calculated = Low heat value indicated in the table/Low heat value of adopted fuel×consumption indicated in the table.

(9) Special order shall be placed if fuels are artificial coal gas, biogas, coal-bed gas, heavy oil, etc.

(10) Gas inlet pressure indicated in the table is the pressure at the outlet of ball valve when the chiller is in operation.

(11) Gas Relative Density = gas density/air density

(12) Overall dimensions indicated in the table include rack dimensions.

(13) The shipping weight includes the rack weight, and excludes the solution weight.

(14) When referring to chilled/heated Water sub-region, data indicated in the round brackets are parameters in heating mode with inlet/outlet temperature difference of 10℃.

Technical Parameters

◆H3D Type Direct-Fired Lithium Bromide Absorption Chiller

Model			DF-	99H3D	132H3D	165H3D	198H3D	231H3D	265H3D	298H3D	331H3D	413H3D
Cooling Capacity			kW	349	465	582	698	814	930	1047	1163	1454
			10^4kcal/h	30	40	50	60	70	80	90	100	125
			USRt	99	132	165	198	231	265	298	331	413
Heating Capacity			kW	279	372	465	558	651	744	837	930	1163
			10^4kcal/h	24	32	40	48	56	64	72	80	100
Chilled/ Hot Water	Inlet/Outlet Temp.(Chilled Water)		℃	12 → 7								
	Inlet/Outlet Temp.(Heated Water)		℃	56 → 60 (50 → 60)								
	Flow Rate		m^3/h	60(24)	80(32)	100(40)	120(48)	140(56)	160(64)	180(72)	200(80)	250(100)
	Pressure Loss		mH$_2$O	8.4(1.3)	8.1(1.3)	8.3(1.3)	8.2(1.3)	8.3(1.3)	7.9(1.3)	8.5(1.4)	11.6(1.9)	4(0.6)
	Connection Diameter(DN)		mm	100	100	125	125	150	150	150	150	200
Cooling Water	Inlet/Outlet Temp		℃	32 → 38								
	Flow Rate		m^3/h	85	113	141	170	198	227	255	283	354
	Pressure Loss		mH$_2$O	7	7	7	7	7	7.6	7.5	5.6	5.6
	Connection Diameter(DN)		mm	100	125	150	150	150	150	200	200	200
Fuel	Natural Gas (11000kcal/Nm^3 Density=0.64)	Consumption Cooling	Nm³/h	19.8	26.4	33.0	39.7	46.3	52.9	59.5	66.1	82.6
		Consumption Heating		22.8	30.5	38.1	45.7	53.3	60.9	68.5	76.2	95.3
		Inlet Pressure	kPa	15 ~ 50								
		Connection Diameter(DN)	mm(in)	1.5"								2"
	Light Oil (10400kcal/kg)	Consumption Cooling	m^3/h	21	28	35	42	49	55.9	62.9	69.9	87.4
		Consumption Heating		24.2	32.2	40.3	48.3	56.4	64.4	72.5	80.5	100.7
		Connection Diameter(DN)	in	3/8"								
Air Flow for Combustion (30℃)		Cooling	m³/h	310	420	520	625	730	835	940	1040	1300
		Heating		360	480	600	720	840	960	1080	1200	1500
Exhaust Connection Dimension			mm	170x250	170x250	200x300	200x300	200x300	250x360	250x360	250x360	250x450
Electrical Data	Electric Power		3Φ-380V/50Hz									
	Total Current		A	16.6	18	18	19.3	22.4	22.6	23.2	23.2	29.4
	Electric Power		kW	4.6	5.1	5.1	5.8	6.6	6.6	6.8	6.8	8.7
Overall Dimensions	Length		mm	3780	3780	3806	3815	3850	3840	3990	4490	4490
	Width			1989	2113	2173	2138	2282	2439	2455	2457	2615
	Height			2333	2317	2349	2375	2415	2498	2546	2595	2867
Shipping Weight			t	6.6	7.7	8.7	8.9	9.4	10.5	11.3	12.1	12.7
Operating Weight				8.1	9.5	10.9	11.1	12.1	13.8	14.9	16	17.2

Note

(1) Values for chilled/heated/cooling water in table above are based on nominal conditions and can be adjusted in actual operation.

(2) The lowest outlet temperature of chilled water is 5℃

(3) Chilled/Heated water can be adjusted in the range of 60~120%.

(4) Scale factor of chilled/heated/cooling water is 0.086m^{2}K/kW (0.0001m^2·h·℃/kcal).

(5) Cooling/Heating capacity can be adjusted in the range of 30~105% for oil-fired type, 25~105% for gas-fired type.

(6) Nominal discharge temperature of flue gas: ≤100℃ for cooling mode, ≤120℃ for heating mode.

(7) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

Technical Parameters

◆H3D Type Direct-Fired Lithium Bromide Absorption Chiller

496H3D	579H3D	661H3D	744H3D	827H3D	992H3D	1157H3D	1323H3D	1488H3D	1653H3D	1984H3D
1745	2035	2326	2617	2908	3489	4071	4652	5234	5815	6978
150	175	200	225	250	300	350	400	450	500	600
496	579	661	744	827	992	1157	1323	1488	1653	1984
1396	1628	1861	2093	2326	2791	3256	3722	4187	4652	5582
120	140	160	180	200	240	280	320	360	400	480
12 → 7										
56→60(50→60)										
300(120)	350(140)	400(160)	450(180)	500(200)	600(240)	700(280)	800(320)	900(360)	1000(400)	1200(480)
6(1)	6(1)	6(1)	7(1.1)	9(1.4)	9(1.4)	12.5(2)	12.5(2)	12.2(2)	12.2(2)	2.2(0.4)
200	200	250	250	250	300	300	350	350	350	400
32 → 38										
425	495	566	637	708	849	991	1132	1274	1415	1698
5.5	6	6	7	8.5	9	12	12	12.7	12.7	13
250	250	250	250	300	350	350	400	400	400	450
99.2	115.7	132.2	148.8	165.3	198.3	231.4	264.5	297.5	330.6	396.7
114.2	133.3	152.3	171.3	190.4	228.5	266.5	304.6	342.7	380.8	456.9
15 ~ 50										
2"					65			80		100
104.9	122.4	139.9	157.3	174.8	209.8	244.8	279.7	314.7	349.7	419.6
120.9	141	161.1	181.2	201.4	241.6	281.9	322.2	362.5	402.7	483.3
1"										
1560	1820	2085	2340	2600	3120	3640	4160	4680	5200	6240
1800	2100	2400	2700	3000	3600	4200	4800	5400	6000	7200
250x500	300x500	300x500	360x550	360x550	400x600	420x700	420x700	550x750	550x750	600x800
3Φ-380V/50Hz										
36.4	36.4	37.4	44.3	56.8	74.3	77.6	79.3	71.6	83.1	85.3
12	12	12.6	15.6	17.1	23.1	23.8	24.3	29.7	33.8	35.3
5100	5100	5165	5660	6045	6155	7230	7230	7427	7603	8536
2812	2995	3048	3200	3367	3390	3843	3983	4187	4611	4760
2922	3084	3225	3218	3221	3370	3491	3760	3864	4214	4314
15.2	17.5	18.8	21.2	24	27.4	32.4	35.7	41.8	47.9	53.9
21.6	24.3	26	29.4	33.7	38.9	46	51.5	59.2	67.4	75.6

Note

(8) Heat values indicated in the table are low heat values, fuel consumption not indicated in the table above can be calculated = Low heat value indicated in the table/Low heat value of adopted fuel×consumption indicated in the table.

(9) Special order shall be placed if fuels are artificial coal gas, biogas, coal-bed gas, heavy oil, etc.

(10) Gas inlet pressure indicated in the table is the pressure at the outlet of ball valve when the chiller is in operation.

(11) Gas Relative Density = gas density/air density

(12) Overall dimensions indicated in the table include rack dimensions.

(13) The shipping weight includes the rack weight, and excludes the solution weight.

Steam Operated Double Effect Lithium Bromide Absorption Chiller

3

Steam operated double effect lithium bromide absorption chiller is a kind of large-size industrial unit with steam as the driving energy , lithium bromide solution as the absorbent and water as refrigerant.

It not only reduces greatly the cost of electricity and operation fees in regions where there are rich steam resources, but also compensates the peak-valley load difference. While in summer, shortage of electric power poses great concerns for many cities. Concentrated consumption of power caused by the use of air conditioners is the sticking point for such a seasonal problem, for which, steam operated double effect chillers offer an attractive solution.

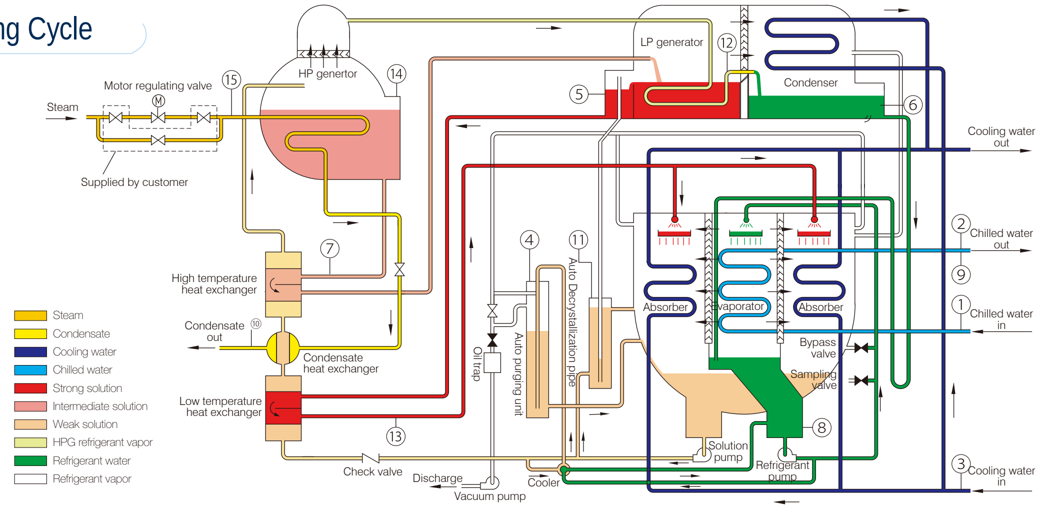
The most attractive feature of Shuangliang steam operated double effect chiller is its stunning performance in energy saving. High COP of 1.33 and provenly high efficiency rank it in the leading position worldwide.

Steam Operated Double Effect
Lithium Bromide Absorption Chiller

Working Principle

The steam operated double effect LiBr absorption chiller uses steam as energy, LiBr solution as absorbent, and water as refrigerant. Its major parts include high pressure generator, low pressure generator, condenser, evaporator, absorber, high and low temperature heat exchangers, condensate heat exchanger, etc. Its auxiliary parts include canned motor pumps (solution pump and refrigerant pump), vacuum pump and purging unit. It is a combination of shell and tube heat exchangers. It is kept under vacuum by vacuum pump and purging unit.

Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Auto-purging unit pressure (I)
⑤ Strong solution temp. in LPG (C,I)
⑥ Condensation temp. (C,I,A)
⑦ Intermediate solution temp. in HPG. (I,A)
⑧ Evaporation temp. (I,A)
⑨ Chilled water flow (A)
⑩ Steam condensate temp. (I)
⑪ De-crystallization pipe temp. (I,A)
⑫ HPG pressure(C,I,A)
⑬ Strong Solution spray temp(C,I)
⑭ Solution level of HPG(C,I)
⑮ Steam pressure (C,I,A)
(C)—Control
(A)—Alarm
(I)—Indication

Special Features of Cooling Cycle

Evaporator Chilled water (about 12℃) enters heat transfer tubes and evaporates refrigerant water which is dripped over the tubes. The produced chilled water (about 7℃) goes into the external system. Refrigerant water absorbs heat from external system, becomes vapor and flows into absorber.

Absorber Strong solution drips over tubes, absorbing refrigerant vapor from evaporator and becoming weak solution. Cooling water from cooling tower enters heat transfer tubes to cool the strong solution distributed tubes and carries away heat from external system. After absorbing vapor, solution is diluted and sent into HPG through heat exchangers.

High Pressure Generator (HPG) The weak solution is concentrated into intermediate solution, which flows into LPG through HT heat exchange. The high temperature refrigerant vapor produced in HPG enters LPG.

Low Pressure Generator (LPG)Intermediate solution from HPG goes into LPG via HT heat exchanger, which is heated by refrigerant vapor and concentrated into strong solution. The strong solution flows into absorber through LT heat exchanger.

At the same time, refrigerant vapor from HPG becomes condensate in LPG and enters condenser. Condenser Cooling water flows through tubes in the condenser and condenses the vapor outside the tubes into refrigerant water. The produced refrigerant water enters the evaporator through U pipe for refrigeration.

LT Heat Exchanger Strong solution from LPG exchanges heat with that of weak solution from absorber to raise the temperature of weak solution and recover heat from strong solution.

Condensate Heat Exchanger Heat exchanging between steam condensate and weak solution from LT heat exchanger is realized to further increase the temperature of weak solution.

HT Heat Exchanger Intermediate solution from HPG exchanges heat with that of weak solution from LT heat exchanger to further raise the temperature of weak solution.

Heat exchangers reduce the heat requirements of HPG and the cooling water requirements. Performance of heat exchangers is critical for efficiency of chiller.

Technical Parameters

◆Steam Operated Double Effect LiBr Absorption Chiller (0.8MPa)(SL)

Model		ST-	99H2H	132H2H	165H2H	198H2H	231H2H	265H2H	298H2H	331H2H	413H2H	496H2H
Cooling Capacity		kW	349	465	582	698	814	930	1047	1163	1454	1745
		10^4kcal/h	30	40	50	60	70	80	90	100	125	150
		USRt	99	132	165	198	231	265	298	331	413	496
Chilled Water	Inlet/outlet Temp	℃	12 → 7									
	Flow Rate	m^3/h	60	80	100	120	140	160	180	200	250	300
	Pressure Loss	mH_2O	5.5	5.5	5.7	5.8	7.8	7.3	7.9	10.9	11	5.5
	Connection Diameter(DN)	mm	100	100	125	125	150	150	150	150	200	200
Cooling Water	Inlet/outlet Temp.	℃	32 → 38									
	Flow Rate	m^3/h	85	113	142	170	198	227	255	283	354	425
	Pressure Loss	mH_2O	7.2	6.9	7	7.4	9	8.9	8.5	6	6.6	8.4
	Connection Diameter(DN)	mm	100	125	150	150	150	150	200	200	200	250
Steam	Consumption	kg/h	372	496	620	744	868	992	1116	1240	1550	1860
	Steam Condensate Temp.	℃	≤95									
	Steam Condensate Back Pressure(G)	MPa	≤0.05									
	Steam Pipe Diameter(DN)	mm	40	50	50	50	65	65	65	65	80	80
	Electric Modulating Valve Diameter(DN)	mm	40	40	40	40	40	50	50	50	65	65
	Steam Condensate Pipe Diameter(DN)	mm	25	25	25	25	25	32	32	32	32	40
Electrical Data	Power Supply		3Φ - 380VAC - 50Hz									
	Total Current	A	8	10	10	10	17.3	17.3	20.3	20.8	20.8	21.8
	Electric Power	kW	3.8	4.1	4.1	4.1	5.9	5.9	6.8	7	7	7.2
Overall Dimensions	Length	mm	3810	3810	3790	3790	3820	3840	3890	4357	4357	4895
	Width		1942	2027	2060	2060	2183	2308	2355	2332	2450	2558
	Height		2152	2170	2169	2217	2231	2316	2364	2384	2702	2717
Shipping Weight		t	6.4	6.9	7.3	7.9	8.3	9	9.6	10.1	11	13.1
Operating Weight			7.7	8.5	9.1	9.8	10.3	11.4	12.1	13.4	14.6	17.4

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation.
With the inlet/outlet temperature of cooling water at 30℃/36℃, steam consumption is 12.2kg/(10^4kcal/h) with COP of 1.43.

(2) Steam pressure of 0.8Mpa(G) refers to the inlet pressure excludes valve pressure loss. The lowest outlet temperature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

Technical Parameters

◆Steam Operated Double Effect LiBr Absorption Chiller (0.8MPa)(SL)

	Model	ST-	579H2H	661H2H	744H2H	827H2H	992H2H	1157H2H	1323H2H	1488H2H	1653H2H	1984H2H
	Cooling Capacity	kW	2035	2326	2617	2908	3489	4071	4652	5234	5815	6978
		10^4kcal/h	175	200	225	250	300	350	400	450	500	600
		USRt	579	661	744	827	992	1157	1323	1488	1653	1984
Chilled Water	Inlet/outlet Temp.	℃	12 → 7									
	Flow Rate	m^3/h	350	400	450	500	600	700	800	900	1000	1200
	Pressure Loss	mH_2O	5.2	5.3	6.1	8.2	8.1	11.5	10.5	11.1	15.3	14.1
	Connection Diameter(DN)	mm	200	250	250	250	300	300	350	350	350	400
Cooling Water	Inlet/outlet Temp.	℃	32 → 38									
	Flow Rate	m^3/h	496	567	638	709	850	992	1134	1275	1417	1700
	Pressure Loss	mH_2O	8.1	8.7	10.2	10.8	11.2	14.3	14.1	5.9	7.6	6.9
	Connection Diameter(DN)	mm	250	250	250	300	300	350	350	400	400	450
Steam	Consumption	kg/h	2170	2480	2790	3100	3720	4340	4960	5580	6200	7440
	Steam Condensate Temp.	℃	≤95									
	Steam Condensate Back Pressure(G)	MPa	≤0.05									
	Steam Pipe Diameter(DN)	mm	80	80	100	100	100	125	125	150	150	150
	Electric Modulating Valve Diameter(DN)	mm	65	80	80	80	80	100	100	100	125	125
	Steam Condensate Pipe Diameter(DN)	mm	40	40	40	40	50	50	50	65	65	65
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz										
	Total Current	A	22.8	22.8	22.8	28.6	33	33	36.6	37.6	49.4	49.4
	Electric Power	kW	7.5	7.5	7.5	9	9.5	9.5	12	12.5	13,9	15
Overall Dimensions	Length	mm	4918	4918	5308	5805	5795	6525	6525	6813	7513	7570
	Width		2740	2760	2815	2800	2930	3209	3334	3354	3354	3756
	Height		2854	2970	3038	3041	3335	3381	3669	3804	3804	4254
	Shipping Weight	t	14.5	16.2	16.8	20.2	24.2	26.6	31.5	33	39	46
	Operating Weight		20	21.9	22.8	28.4	33.4	37.2	44.2	48	54.7	64.2

Notes

(4) Scale factor of chilled/cooling water is $0.086m^2K/kW$ ($0.0001m^2 \cdot h \cdot ℃/kcal$).

(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(6) The transporation rack is 180mm high. For chiller of ST-992H2H and larger, the transportation rack is submerged type and 60mm high.

(7) Shipping weight includes rack weight, but excludes solution weight

Steam Operated Double Effect
Lithium Bromide Absorption Chiller

Technical Parameters

◆Steam Operated Double Effect LiBr Absorption Chiller (0.6MPa)(SL)

	Model	ST-	99H2	132H2	165H2	198H2	231H2	265H2	298H2	331H2	413H2	496H2	579H2
	Cooling Capacity	kW	349	465	582	698	814	930	1047	1163	1454	1745	2035
		10^4kcal/h	30	40	50	60	70	80	90	100	125	150	175
		USRt	99	132	165	198	231	265	298	331	413	496	579
Chilled Water	Inlet/outlet Temp.	℃	12 → 7										
	Flow Rate	m^3/h	60	80	100	120	140	160	180	200	250	300	350
	Pressure Loss	mH_2O	4.4	4.5	4.7	5.7	5.6	6.2	8.8	8.8	3.8	3.8	4.1
	Connection Diameter(DN)	mm	100	100	125	125	150	150	150	150	200	200	200
Cooling Water	Inlet/outlet Temp.	℃	32 → 38										
	Flow Rate	m^3/h	86	114	143	172	200	229	257	286	357	429	500
	Pressure Loss	mH_2O	6.6	6.3	6.5	7	7.6	7.8	5.4	5.4	7.2	6.6	6.9
	Connection Diameter(DN)	mm	100	125	150	150	150	150	200	200	200	250	250
Steam	Consumption	kg/h	376	501	627	752	877	1003	1128	1253	1566	1880	2193
	Steam Condensate Temp.	℃	≤90										
	Steam Condensate Back Pressure(G)	MPa	≤0.05										
	Steam Pipe Diameter(DN)	mm	40	50	50	65	65	65	65	80	80	80	80
	Electric Modulating Valve Diameter(DN)	mm	40	40	40	50	50	50	50	65	65	65	80
	Steam Condensate Pipe Diameter(DN)	mm	25	25	25	25	32	32	32	32	40	40	40
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz											
	Total Current	A	8	10	10	17.3	17.3	20.3	20.8	20.8	21.8	22.8	22.8
	Electric Power	kW	3.8	4.1	4.1	5.9	5.9	6.8	7	7	7.2	7.5	7.5
Overall Dimensions	Length	mm	3810	3810	3790	3820	3840	3840	4357	4357	4855	4918	4918
	Width		1942	2027	2060	2183	2308	2355	2332	2450	2558	2740	2760
	Height		2152	2170	2169	2231	2316	2364	2384	2627	2717	2854	2970
	Shipping Weight	t	6.5	7.1	7.5	8.1	9	9.4	10.1	10.5	12.8	14.5	15.6
	Operating Weight		7.8	8.7	9.3	10.1	11.4	11.9	13.4	14	17.1	20	21.3

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation.
With the inlet/outlet temperature of cooling water at 30℃/36℃, steam consumption is 12.35kg/(10^4kcal/h) with COP of 1.41.

(2) Steam pressure of 0.6 Mpa(G) refers to the inlet pressure excludes valve pressure loss. The lowest outlet temperature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

Steam Operated Double Effect
Lithium Bromide Absorption Chiller

Technical Parameters

◆Steam Operated Double Effect LiBr Absorption Chiller (0.6MPa)(SL)

Model		ST-	661H2	744H2	827H2	992H2	1157H2	1323H2	1488H2	1653H2	1984H2	2646H2	3307H2
Cooling Capacity		kW	2326	2617	2908	3489	4071	4652	5234	5815	6978	9304	11630
		10^4kcal/h	200	225	250	300	350	400	450	500	600	800	1000
		USRt	661	744	827	992	1157	1323	1488	1653	1984	2646	3307
Chilled Water	Inlet/outlet Temp.	℃	12 → 7										
	Flow Rate	m^3/h	400	450	500	600	700	800	900	1000	1200	1600	2000
	Pressure Loss	mH_2O	4.9	6.6	6.4	8.4	8.1	8.8	12.4	11.8	2.6	5	7.5
	Connection Diameter(DN)	mm	250	250	250	300	300	350	350	350	400	400	450
Cooling Water	Inlet/outlet Temp.	℃	32 → 38										
	Flow Rate	m^3/h	572	643	715	858	1001	1144	1287	1430	1716	2288	2860
	Pressure Loss	mH_2O	8.8	9.8	9.2	11.3	11.2	5.2	6.3	6.7	8.7	12	16
	Connection Diameter(DN)	mm	250	250	300	350	350	400	400	400	450	500	600
Steam	Consumption	kg/h	2506	2819	3133	3759	4386	5012	5639	6265	7518	10024	12530
	Steam Condensate Temp.	℃	≤90										
	Steam Condensate Back Pressure(G)	MPa	≤0.05										
	Steam Pipe Diameter(DN)	mm	100	100	100	125	125	150	150	150	150	200	200
	Electric Modulating Valve Dia.(DN)	mm	80	80	100	100	100	125	125	125	150	150	200
	Steam Condensate Pipe Diameter(DN)	mm	40	40	50	50	50	65	65	65	6 5	80	100
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz											
	Total Current	A	22.8	28.6	28.6	33	36.6	37.6	37.6	49.4	49.4	55.3	68.9
	Electric Power	kW	7.5	9	9	9.5	12	12.5	12.5	13.9	15	19	26.8
Overall Dimensions	Length	mm	5308	5733	5795	6525	6525	6813	7513	7513	9118	9375	11580
	Width		2815	2800	2930	3209	3334	3354	3354	3756	3766	4341	4341
	Height		3038	3041	3260	3381	3669	3804	3804	4154	4164	4977	5177
Shipping Weight		t	16.8	18.6	22	26.6	30	33	36.5	43.6	51	64	76
Operating Weight			22.8	26.8	31.1	37.2	42.7	48	52.2	61.8	72.7	93	112

Notes

(4) Scale factor of chilled/cooling water is $0.086m^2K/kW$ ($0.0001m^2 \cdot h \cdot ℃/kcal$).
(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).
(6) The transporation rack is 180mm high. For chiller of ST-827H2 and larger, the transportation rack is submerged type and 60mm high.
(7) Shipping weight includes rack weight, but excludes solution weight.

Technical Parameters

◆Steam Operated Double Effect LiBr Absorption Chiller (0.4MPa)(SL)

Model		ST-	83H2L	99H2L	132H2L	165H2L	198H2L	231DH2L	265H2L	331H2L	413H2L	496H2L	579H2L	661H2L	827H2L	992H2L	1157H2L	1323H2L
Cooling Capacity		kW	290	350	470	580	700	810	930	1160	1450	1740	2040	2330	2910	3490	4070	4650
		10^4kcal/h	25	30	40	50	60	70	80	100	125	150	175	200	250	300	350	400
		USRt	83	99	132	165	198	231	265	331	413	496	579	661	827	992	1157	1323
Chilled Water	Inlet/Outlet Temp.	℃	12 → 7															
	Flow Rate	m^3/h	50	60	80	100	120	140	160	200	250	300	350	400	500	600	700	800
Cooling Water	Inlet/Outlet Temp.	℃	32 → 38															
	Flow Rate	m^3/h	72	86	115	144	173	202	230	288	360	432	504	576	720	864	1008	1152
Steam	Consumption	kg/h	319	383	510	638	765	893	1020	1275	1594	1913	2231	2550	3188	3825	4463	5100
	Steam condensate Temp.	℃	≤85															
	Steam Condensare Back Pressure(G)	MPa	≤0.05															
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz																

Notes

(1) Values for steam,chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation. With the inlet/outlet temperature of cooling water at 30℃/36℃, the steam consumption is only 12.6kg/(10^4kcal/h), and the COP value is 1.38.
(2) Steam pressure of 0.4 Mpa(G) refers to the inlet pressure excluding valve pressure loss. The lowest outlet temperature of chilled water is 5℃
(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.
(4) Scale factor of chilled/cooling water is $0.086m^2K/kW$ ($0.0001m^2 \cdot h \cdot ℃/kcal$).
(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

Technical Parameters

◆J Type Steam Operated Double Effect LiBr Absorption Chiller (0.8MPa)(SL)

Model		ST-	99JH	132JH	165JH	198JH	231JH	265JH	298JH	331JH	413JH	496JH	579JH
Cooling Capacity		kW	349	465	582	698	814	930	1047	1163	1454	1745	2035
		10^4kcal/h	30	40	50	60	70	80	90	100	125	150	175
		USRt	99	132	165	198	231	265	298	331	413	496	579
Chilled Water	Inlet/outlet Temp	℃	12 → 7										
	Flow Rate	m^3/h	60	80	100	120	140	160	180	200	250	300	350
	Pressure Loss	mH_2O	6.5	6.5	6.5	6.5	7.2	6.9	6.7	9.9	10.1	5.0	4.7
	Connection Diameter(DN)	mm	100	100	125	125	150	150	150	150	200	200	200
Cooling Water	Inlet/outlet Temp.	℃	32 → 38										
	Flow Rate	m^3/h	82	109	137	164	191	218	246	273	341	410	478
	Pressure Loss	mH_2O	9.8	9.8	9.8	9.8	10.9	10.4	10.1	7.6	7.8	12.4	11.7
	Connection Diameter(DN)	mm	100	125	150	150	150	150	200	200	200	250	250
Steam	Consumption	kg/h	341	454	568	681	795	908	1022	1135	1419	1703	1986
	Steam Condensate Temp.	℃	≤95										
	Steam Condensate Back Pressure(G)	MPa	≤0.05										
	Steam Pipe Diameter(DN)	mm	40	50	50	50	65	65	65	65	80	80	80
	Electric Modulating Valve Diameter(DN)	mm	40	40	40	40	40	50	50	50	65	65	65
	Steam Condensate Pipe Diameter(DN)	mm	25	25	25	25	25	32	32	32	32	40	40
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz											
	Total Current	A	12.6	13.7	13.7	15	16,8	16,8	16,8	17,4	19,8	20.8	20.8
	Electric Power	kW	3.8	4.2	4.2	4.6	5	5	5	5.2	5.9	6.3	6.3
Overall Dimensions	Length	mm	3750	3750	3780	3800	3800	3800	4500	4500	4500	5010	5060
	Width		1942	2027	2060	2183	2308	2355	2340	2388	2448	2528	2710
	Height		2200	2250	2300	2380	2470	2530	2530	2530	2870	2927	3020
Shipping Weight		t	6.7	7.3	7.7	8.3	8.6	9.5	10.1	10.6	12.6	13.8	15.3
Operating Weight			8.2	9.1	9.8	10.5	10.9	12.3	13	14.4	15.6	18.7	21.6

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation. With the inlet/outlet temperature of cooling water at 30℃/36℃, steam consumption is 11.2kg/(10^4kcal/h) with COP of 1.55.

(2) Steam pressure of 0.8 Mpa(G) refers to the inlet pressure without any valve pressure loss. The lowest outlet temperature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

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Technical Parameters

◆J Type Steam Operated Double Effect LiBr Absorption Chiller (0.8MPa)(SL)

Model		ST-	661JH	744JH	827JH	992JH	1157JH	1323JH	1488JH	1653JH	1984JH	2646JH	2976JH	3307JH
Cooling Capacity		kW	2326	2617	2908	3489	4071	4652	5234	5815	6978	9304	10467	11630
		10^4kcal/h	200	225	250	300	350	400	450	500	600	800	900	1000
		USRt	661	744	827	992	1157	1323	1488	1653	1984	2646	2976	3307
Chilled Water	Inlet/outlet Temp.	℃	12 → 7											
	Flow Rate	m^3/h	400	450	500	600	700	800	900	1000	1200	1600	1800	2000
	Pressure Loss	mH_2O	4.5	5.7	7.0	7.2	10.7	10.3	10.0	13.6	13.1	6.0	6.5	6.5
	Connection Diameter(DN)	mm	250	250	250	300	300	350	350	350	400	450	500	500
Cooling Water	Inlet/outlet Temp.	℃	32 → 38											
	Flow Rate	m^3/h	546	614	683	819	956	1092	1229	1365	1638	2184	2457	2730
	Pressure Loss	mH_2O	11.3	6.5	7.4	7.6	11.1	10.6	10.3	13.8	13.3	12.0	13.0	13.0
	Connection Diameter(DN)	mm	250	250	300	300	350	350	400	400	450	500	600	600
Steam	Consumption	kg/h	2270	2554	2838	3405	3973	4540	5108	5675	6810	9080	10215	11350
	Steam Condensate Temp.	℃	≤95											
	Steam Condensate Back Pressure(G)	MPa	≤0.05											
	Steam Pipe Diameter(DN)	mm	80	100	100	100	125	125	150	150	150	200	200	200
	Electric Modulating Valve Diameter(DN)	mm	80	80	80	80	100	100	100	125	125	150	200	200
	Steam Condensate Pipe Diameter(DN)	mm	40	40	40	50	50	50	65	65	65	80	100	100
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz												
	Total Current	A	21.8	22.8	28.6	30.7	33	35	37.6	44.3	49.4	55.3	68.9	68.9
	Electric Power	kW	6.9	7.3	8.3	9.3	10	10.5	11.5	13	14.5	19.0	26.8	26.8
Overall Dimensions	Length	mm	5060	5310	5815	5815	6525	6525	6915	7615	7615	9380	10350	10350
	Width		2710	2785	2770	2900	3134	3264	3324	3324	3629	4341	4341	4341
	Height		3021	3230	3246	3515	3541	3760	3980	3980	4334	4890	5080	5250
Shipping Weight		t	17	17.7	20.4	25.5	28	33.1	34.8	39	48.3	62.3	68.4	74.8
Operating Weight			23.6	24.6	30.8	36.1	40.2	48.3	52.1	59.4	69.2	91.6	101.6	112

Notes

(4) Scale factor of chilled/cooling water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(6) The transportation rack is 180mm high. For chiller of ST-992J and larger, transportation rack is submerged and 60mm high.

(7) Shipping weight includes rack weight, but excludes solution weight.

Technical Parameters

◆J Type Steam Operated Double Effect LiBr Absorption Chiller (0.6MPa)(SL)

Model		ST-	99J	132J	165J	198J	231J	265J	298J	331J	413J	496J	579J
Cooling Capacity		kW	349	465	582	698	814	930	1047	1163	1454	1745	2035
		10^4kcal/h	30	40	50	60	70	80	90	100	125	150	175
		USRt	99	132	165	198	231	265	298	331	413	496	579
Chilled Water	Inlet/outlet Temp.	℃	12 → 7										
	Flow Rate	m^3/h	60	80	100	120	140	160	180	200	250	300	350
	Pressure Loss	mH_2O	5.3	5.3	5.3	5.3	5.3	5.3	8.0	8.0	11.5	11.5	11.5
	Connection Diameter(DN)	mm	100	100	125	125	150	150	150	150	200	200	200
Cooling Water	Inlet/outlet Temp.	℃	32 → 38										
	Flow Rate	m^3/h	83	110	138	166	193	221	248	276	345	414	483
	Pressure Loss	mH_2O	8.2	8.2	8.2	8.2	8.2	8.2	6.5	6.5	8.8	8.8	8.8
	Connection Diameter(DN)	mm	100	125	150	150	150	150	200	200	200	250	250
Steam	Consumption	kg/h	345	460	575	690	805	920	1035	1150	1438	1725	2013
	Steam Condensate Temp.	℃	≤90										
	Steam Condensate Back Pressure(G)	MPa	≤0.05										
	Steam Pipe Diameter(DN)	mm	40	50	50	65	65	65	65	80	80	80	80
	Electric Modulating Valve Diameter(DN)	mm	40	40	40	50	50	50	50	65	65	65	80
	Steam Condensate Pipe Diameter(DN)	mm	25	25	25	25	32	32	32	32	40	40	40
Electrical Data	Power Supply		3Φ - 380VAC - 50Hz										
	Total Current	A	12.6	13.7	13.7	16.8	16.8	16.8	17.4	19.8	20.8	20.8	20.8
	Electric Power	kW	3.8	4.2	4.2	5.0	5.0	5.0	5.2	5.9	6.3	6.3	6.3
Overall Dimensions	Length	mm	3750	3750	3780	3800	3800	3800	4500	4500	5010	5060	5060
	Width		1942	2027	2060	2183	2308	2355	2388	2448	2528	2710	2710
	Height		2200	2250	2300	2380	2470	2530	2530	2793	2927	3020	3021
Shipping Weight		t	6.8	7.5	7.9	8.4	9.5	9.9	10.6	11	13.5	15.3	16.4
Operating Weight			8.3	9.3	10	10.7	12.3	12.8	14.4	15	18.4	21.6	23

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation. With the inlet/outlet temperature of cooling water at 30℃/36℃, steam consumption is 11.33kg/(10^4kcal/h) with COP of 1.53.

(2) Steam pressure of 0.6 Mpa(G) refers to the inlet pressure without any valve pressure loss. The lowest outlet temperature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

Technical Parameters

◆J Type Steam Operated Double Effect LiBr Absorption Chiller (0.6MPa)(SL)

Model		ST-	661J	744J	827J	992J	1157J	1323J	1488J	1653J	1984J	2646J	3307J
Cooling Capacity		kW	2326	2617	2908	3489	4071	4652	5234	5815	6978	9304	11630
		10^4kcal/h	200	225	250	300	350	400	450	500	600	800	1000
		USRt	661	744	827	992	1157	1323	1488	1653	1984	2646	3307
Chilled Water	Inlet/outlet Temp.	℃	12 → 7										
	Flow Rate	m^3/h	400	450	500	600	700	800	900	1000	1200	1600	2000
	Pressure Loss	mH_2O	4.5	5.7	5.7	7.9	7.9	7.9	11.0	11.0	3.0	3.3	6.0
	Connection Diameter(DN)	mm	250	250	250	300	300	350	350	350	400	450	500
Cooling Water	Inlet/outlet Temp.	℃	32 → 38										
	Flow Rate	m^3/h	552	621	690	828	966	1104	1242	1380	1656	2208	2760
	Pressure Loss	mH_2O	5.3	6.2	6.2	8.3	8.3	8.3	11.5	11.5	6.9	7.5	13.0
	Connection Diameter(DN)	mm	250	250	300	350	350	400	400	400	450	500	600
Steam	Consumption	kg/h	2300	2588	2875	3450	4025	4600	5175	5750	6900	9200	11500
	Steam Condensate Temp.	℃	≤90										
	Steam Condensate Back Pressure(G)	MPa	≤0.05										
	Steam Pipe Diameter(DN)	mm	100	100	100	125	125	150	150	150	150	200	200
	Electric Modulating Valve Dia.(DN)	mm	80	80	100	100	100	125	125	125	150	150	200
	Steam Condensate Pipe Diameter(DN)	mm	40	40	50	50	50	65	65	65	6 5	80	100
Electrical Data	Power Supply		3Φ - 380VAC - 50Hz										
	Total Current	A	22.8	28.6	28.6	33	35	37.6	37.6	44.3	49.4	55.3	68.9
	Electric Power	kW	7.5	8.3	8.3	10.0	10.5	11.5	11.5	13.0	14.5	19.0	26.8
Overall Dimensions	Length	mm	5310	5815	5815	6500	6525	6915	7615	7615	9120	9375	11550
	Width		2785	2770	2900	3134	3264	3324	3324	3629	3726	4341	4341
	Height		3230	3246	3440	3541	3800	3980	3980	4234	4244	5020	5250
Shipping Weight		t	17.7	19.6	23.2	28	30.7	34.8	38.5	45.7	53.7	67	80
Operating Weight			24.6	29	33.7	40.2	46.6	52.1	56.6	66.7	78.7	100	132

Notes

(4) Scale factor of chilled/cooling water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(6) The transportation rack is 180mm high. For chiller of ST-827J and larger, transportation rack is submerged and 60mm high.

(7) Shipping weight includes rack weight, but excludes solution weight.

Technical Parameters

◆J Type Steam Operated Double Effect LiBr Absorption Chiller (0.4MPa)(SL)

Model		ST-	66J	99J	132J	165J	198J	231J	265J	331J	413J	496J	579J	661J	827J	992J	1157J	1323J
Cooling Capacity		kW	233	349	465	582	698	814	930	1163	1454	1745	2035	2326	2908	3489	4071	4652
		10^4kcal/h	20	30	40	50	60	70	80	100	125	150	175	200	250	300	350	400
		USRt	66	99	132	165	198	231	265	331	413	496	579	661	827	992	1157	1323
Chilled Water	Inlet/Outlet Temp.	℃	12 → 7															
	Flow Rate	m^3/h	50	60	80	100	120	140	160	200	250	300	350	400	500	600	700	800
	Pressure Loss	mH_2O	3	2.5	3	4	3.5	5.4	5.7	2.4	2.6	3	4	4.4	8.7	5.9	6.7	9.8
	Connection Diameter(DN)	mm	80	100	100	125	125	150	150	150	200	200	200	250	250	300	300	350
Cooling Water	Inlet/Outlet Temp.	℃	32 → 38															
	Flow Rate	m^3/h	57	83	111	139	167	195	222	278	348	417	487	556	695	834	973	1112
	Pressure Loss	mH_2O	4	4.7	5.1	5.7	5.3	4.3	4.4	5.2	5.4	5.8	6.7	6.9	8.7	9	4.6	5.5
	Connection Diameter(DN)	mm	80	100	125	150	150	150	150	200	20	250	250	250	300	350	350	400
Steam	Consumption	kg/h	234	351	468	585	702	819	936	1170	1463	1755	2048	2340	2925	3510	4095	4680
	Steam condensate Temp.	℃	≤85															
	Steam Condensate Back Pressure(G)	MPa	≤0.05															
	Steam Pipe Diameter(DN)	mm	40	50	50	65	65	65	80	80	80	80	100	100	125	125	150	150
	Electic Regulating Valve Diameter(DN)	mm	40	40	40	50	50	50	65	65	65	80	80	100	100	100	125	125
	Steam Condensate Pipe(DN)	mm	25	25	25	25	32	32	32	40	40	40	40	50	50	50	65	65
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz																

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation. With the inlet/outlet temperature of cooling water at 30℃/36℃, the steam consumption is 11.56kg/(10^4kcal/h) with COP of 1.5.

(2) Steam pressure of 0.4 Mpa(G) refers to the inlet pressure without any valve pressure loss. The lowest outlet temperature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

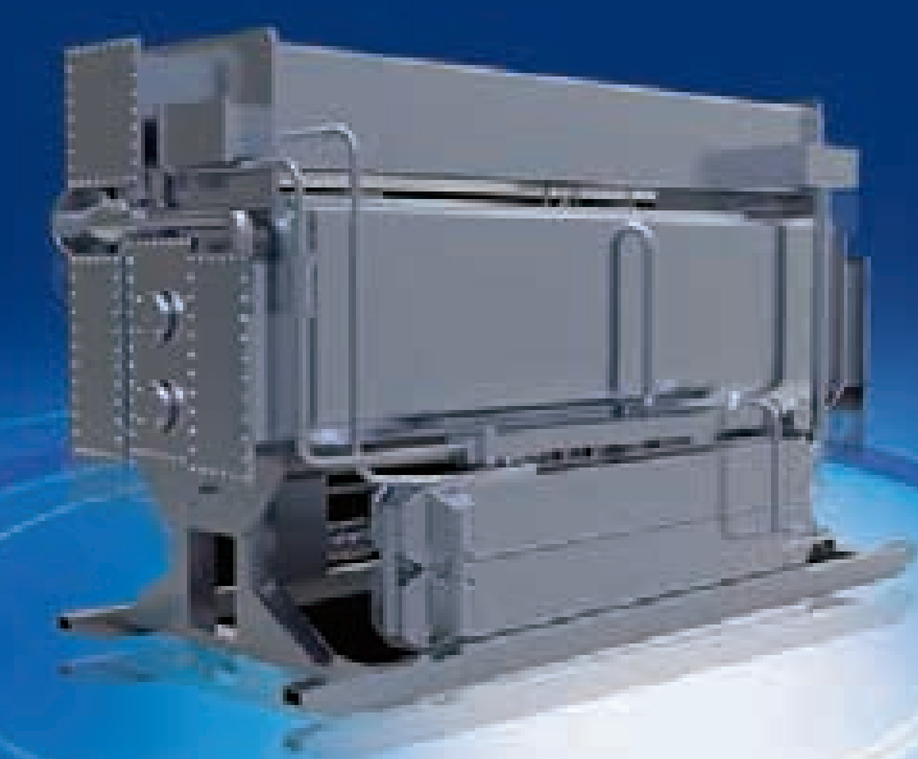
(4) Scale factor of chilled/cooling water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

Steam Operated Single Effect Lithium Bromide Absorption Chiller

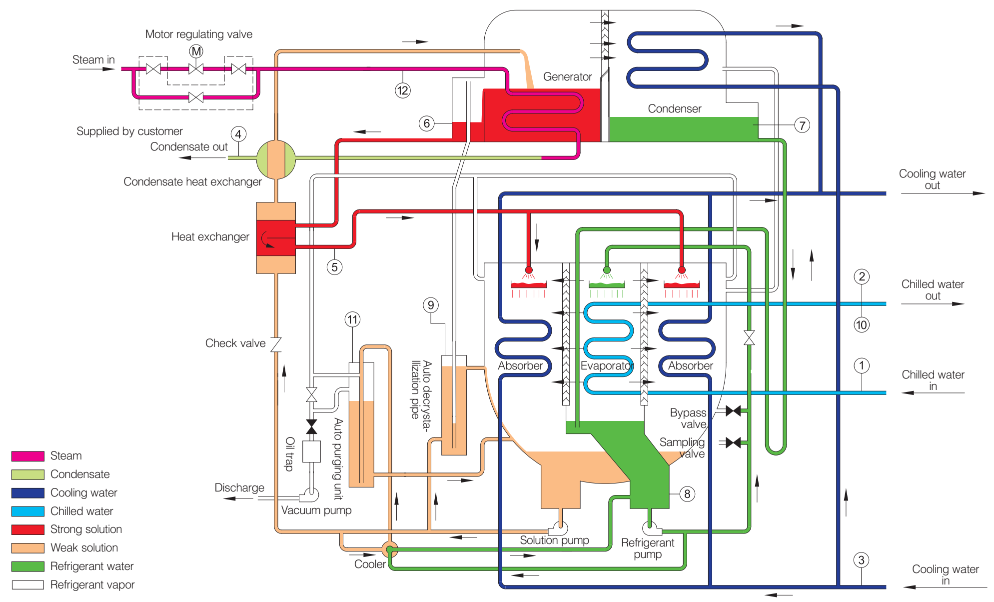
4

Steam operated single effect lithium bromide absorption chiller is a kind of large-size refrigeration unit with low pressure steam as the driving energy, lithium bromide solution as the absorbent and water as refrigerant. It uses steam or waste steam as the energy source, not only reducing greatly the cost of electricity but also possessing-great economic potential in applications where this source of energy is available.



Working Principle

Cooling Cycle



① Chilled water inlet temp.(I)
② Chilled water outlet temp.(I,C,A)
③ Cooling water inlet temp.(I,C,A)
④ Condensate temp. (I)
⑤ Solution spray temp. (I,C)
⑥ Strong solution outlet temp. (I,C,A)
⑦ Condensation temp. (I,C,A)
⑧ Evaporation temp. (I,A)
⑨ De-crystallization temp. (I,A)
⑩
⑪ Vacuum pressure (I)
⑫ Steam pressure (I,C,A)

(I)—Indication
(C)—Control
(A)—Alarm

Special Features of Cooling Cycle

Evaporator Chilled water enters heat transfer tubes and evaporates refrigerant water which is dripped over the tubes. The produced chilled water goes into the external system. Refrigerant water absorbs heat from external system, becomes vapor and flows into absorber.

Absorber Strong solution drips over tubes, absorbing refrigerant vapor from evaporator and becoming weak solution. Cooling water from cooling tower enters heat transfer tubes to cool the strong solution distributed tubes and carries away heat from external system. After absorbing vapor, solution is diluted and sent into generator through heat exchangers.

Weak solution in absorber is pumped by the solution pump into the generator to be heated by steam after passing through the heat exchanger. Through these heat exchanging processes, the weak solution is concentrated to strong solution. Meanwhile, the refrigerant vapor generated is condensed into water in the condenser. Then, the resulting latent heat is carried out of chiller by cooling water.

Condenser Cooling water flows through tubes in condenser and condenses the vapor outside the tubes into refrigerant water. The produced refrigerant water enters evaporator through U pipe for cooling.

Condensate Heat Exchanger Heat exchanging between steam condensate and weak solution from heat exchanger is realized to further increase the temperature of weak solution.

Heat Exchanger Strong solution from generator exchanges heat with that of weak solution from absorber.

Heat exchangers reduce the heat requirements of generator and the cooling water requirements. Performance of heat exchangers is critical for efficiency of chiller.

Technical Parameters

◆Steam Operated Single Effect LiBr Absorption Chiller

Model		SS-	99H2	132H2	165H2	265H2	331H2	413H2	496H2	579H2	661H2	744H2	827H2	992H2	1157H2	1323H2	1653H2	1984H2
Cooling Capacity		kW	349	465	582	930	1163	1454	1745	2035	2326	2617	2908	3489	4071	4652	5815	6978
		10^4kcal/h	30	40	50	80	100	125	150	175	200	225	250	300	350	400	500	600
		USRt	99	132	165	265	331	413	496	579	661	744	827	992	1157	1323	1653	1323
Chilled Water	Inlet/outlet Temp.	℃	12 → 7															
	Flow Rate	m^3/h	60	80	100	160	200	250	300	350	400	450	500	600	700	800	1000	1200
	Pressure Loss	mH_2O	4.4	5.5	5.2	5.3	8.2	3.5	3.5	3.5	4.6	5.8	5.8	7.9	8.1	7.3	11.5	2.6
	Connection Diameter(DN)	mm	100	125	125	150	150	200	200	200	250	250	250	300	300	350	350	400
Cooling Water	Inlet/outlet Temp.	℃	32 → 40															
	Flow Rate	m^3/h	85	113	142	226	283	354	425	495	566	637	708	849	991	1132	1415	1698
	Pressure Loss	mH_2O	7.3	7.9	7.9	8	10.2	9.0	8.4	8.4	10.5	6.5	6.5	7.9	8.1	7.5	10.7	6.4
	Connection Diameter(DN)	mm	100	150	150	200	200	200	250	250	250	300	300	350	350	400	400	450
Steam	Pressure(G)	MPa	0.1															
	Consumption	kg/h	684	912	1140	1824	2280	2850	3420	3990	4560	5130	5700	6840	7980	9120	11400	13680
	Steam Condensate Temp.	℃	≤90															
	Steam Condensate Back Pressure(G)	MPa	≤0.02															
	Steam Pipe Diameter(DN)	mm	100	125	125	150	150	200	200	200	250	250	300	300	300	300	300	350
	Steam Condensate Pipe Diameter(DN)	mm	25	25	25	40	40	40	50	50	50	65	65	65	80	80	100	100
Electrical Data	Power Supply		3Φ - 380VAC - 50Hz															
	Total Current	A	13.6	14.7	14.7	17.8	20.2	20.8	20.8	20.8	22.7	27.0	27.9	32.8	34.5	37.5	43.3	49.4
	Electric Power	kW	4.2	4.6	4.6	5.4	5.9	6.3	6.3	6.3	6.9	8.3	8.3	10	10.5	11.5	13	15
Overall Dimensions	Length	mm	3950	3850	3900	3955	4475	5080	5138	5150	5590	5960	5985	6695	6715	6855	7520	9183
	Width		1592	1698	1802	2010	2132	2194	2380	2475	2476	2521	2555	2700	2855	3215	3077	3217
	Height		2346	2406	2438	2773	2804	2985	3210	3318	3381	3425	3643	3759	4100	4495	4397	4613
Shipping Weight		t	5.9	6.3	6.7	8.2	9.7	11.6	13.0	14.6	16.8	17.8	19.6	22.8	26.1	28.8	35.6	41.7
Operating Weight			7.2	8	8.4	10.6	12.8	15.2	17.4	20.0	22.4	24.2	26.6	31.6	36.2	40	49	58

Notes

(1) Values for steam, chilled water and cooling water in the table above are based on nominal conditions and can be adjusted in actual operation.

(2) The lowest outlet temprature of chilled water is 5℃.

(3) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

(4) Scale factor of chilled/cooling/hot water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(5) The maximum pressure bearing capacity of chilled/cooling water box for normal pressure chiller is 0.8 MPa(G).

(6) The transportation rack is 180mm high. For chiller of SS 661H2 and larger, the transportation rack is submerged type and 60mm high.

(7) Shipping weight includes rack weight, but excludes solution weight.

5 Hot Water Operated Two Stage Lithium BromideAbsorption Chiller

Hot water operated two stage lithium bromide absorption chiller is a kind of large-size industrial unit with hot water as the driving energy,lithium bromide solution as the absorbent and water as refrigerant.

It not only greatly reduces the cost of electricity and operation fees in regions where there are rich hot water resources, but also compensates the peak-valley load difference. While in summer, shortage of electric power poses great concerns worry for many cities. Concentrated consumption of power caused by the use of air conditioners is the sticking point of the seasonal problem, for which, hot water operated two stage chillers offer an attractive solution.

Shuangliang hot water operated two stage chillers are widely applied in industries, such as precision machinery manufacturing, instruments & meters, aviation & aerospace, textiles, electronics, electric power, metallurgy, pharmaceuticals, cigarettes, chemicals, hospitals, food, etc. By utilizing dozens of patented technologies that are extremely efficient and environmentally friendly, with over 30 years of customer service experience, Shuangliang guarantees to reward users with optimal returns.

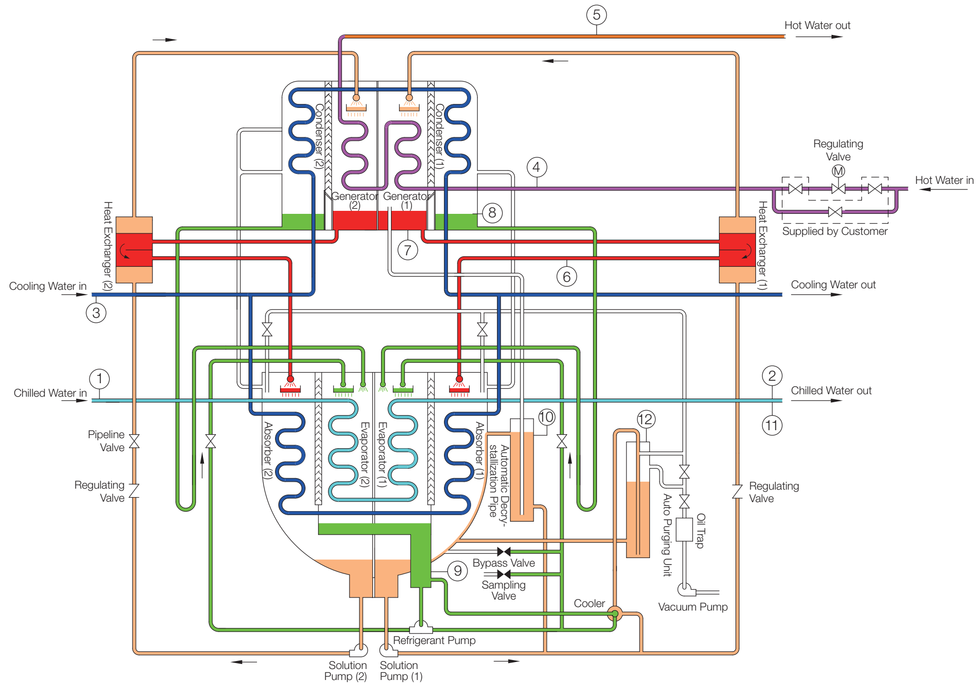
Working Principle

Cooling Cycle

① Chilled water inlet temp. (I)
② Chilled water outlet temp. (C,I,A)
③ Cooling water inlet temp. (C,I,A)
④ Hot water inlet temp. (C.I,A)
⑤ Hot water outlet temp. (I)
⑥ Strong solution spray temp. (C.I)
⑦ Strong solution outlet temp. (C.I)
⑧ Condensation temp. (C.I.A)
⑨ Evaporation temp. (I.A)
⑩ De-crystallization pipe temp. (I.A)
⑪ Chilled water flow switch (A)
⑫ Vacuum pressure (I)

(C)-Control
(A)-Alarm
(I)-Indication

Hot water (High temperature)
Hot water (Low temperature)
Cooling water
Chilled water
Strong solution
Weak solutian
Refrigerant vapor
Liquid refrigerant



Special Features of Cooling Cycle

For hot water operated two stage absorption chiller, there is a pair of generators, condensers, evaporators and absorbers, which form two independent subsystems with own cooling and solution cycle. Hot water, chilled water and cooling water systems are connected serially. Besides, hot water flows against the solution to form countercurrent heat exchange.

It can produce chilled water with outlet temp. of 7℃ and inlet temp. of 12℃under conditions that hot water inlet and outlet temp. are 130℃ and 68℃, cooling water inlet and outlet temp. are 32℃ and 38℃ respectively. The maximum temperature difference of hot water is 62℃.

Cooling cycle is realized by two cycles simultaneously and repeatedly: the solution cycle, in which the solution changes from strong to weak state and vice versa; and refrigeration cycle, in which the refrigerant changes from liquid to vapor state and vice versa.

Heat exchangers reduce the heat requirements of generators and the cooling water requirements. Performance of heat exchangers is critical for efficiency of chiller.

In order to better utilize the energy from hot water, rational solution distribution ratio between subsystems shall be selected.

Technical Parameters

◆Hot Water Operated Two Stage LiBr Absorption Chiller

Model		HSC(130/68)- HSB(120/68)-	99H2	165H2	198H2	231H2	265H2	331H2	413H2	496H2	579H2	661H2	744H2	827H2	992H2	1157H2	1323H2	1488H2
Cooling Capacity		kW	349	582	700	810	930	1163	1454	1745	2306	2326	2617	2908	3489	4071	4652	5234
		10^4kcal/h	30	50	60	70	80	100	125	150	175	200	225	250	300	350	400	450
		USRt	99	165	198	231	265	331	413	496	579	661	744	827	992	1157	1323	1488
Chilled Water	Inlet/Outlet Temp.	℃	12 → 7															
	Flow Rate	m^3/h	60	100	120	140	160	200	250	300	350	400	450	500	600	700	800	900
	Pressure Loss	mH_2O	14.9	14.9	14.5	12.7	11.8	7.0	6.9	9.2	9.2	11.7	11.7	16.2	16.2	18.3	13.2	15.3
	Connection Diameter (DN)	mm	100	125	125	150	150	150	200	200	200	250	250	250	300	300	350	350
Cooling Water	Inlet/Outlet Temp.	℃	32 → 38															
	Flow Rate	m^3/h	114	189	227	264	303	378	473	567	662	756	851	945	1134	1323	1512	1701
	Pressure Loss	mH_2O	9.0	9.1	9.2	8.6	7.1	9.3	9.2	11.2	11.2	14.0	13.6	10.7	10.7	11.0	13.9	17.4
	Connection Diameter (DN)	mm	125	150	200	200	200	250	250	300	300	300	350	350	400	450	450	450
Hot Water	Inlet/Outlet Temp.	℃	68															
	Consumption(130/68)	t/h	6.1	10.2	12.2	14.3	16.3	20.4	25.5	30.6	35.7	40.8	45.9	51.0	61.2	71.4	81.6	91.8
	Consumption(120/68)		7.3	12.2	14.6	17.0	19.4	24.3	30.4	36.5	42.5	48.6	54.7	60.8	76.9	85.1	97.2	109.4
	Pressure Loss	mH_2O	9.3	9.8	8.8	12.2	9.3	9.1	9.0	11.9	11.9	9.6	10.0	13.3	13.3	11.4	15.6	11.1
	Piping Diameter (DN)	mm	40	50	50	50	65	80	80	80	80	100	100	100	125	125	150	150
Electrical Data	Power Supply		3Φ - 380VAC - 50Hz															
	Total Current	A	19.5	23.3	23.3	23.3	25.5	25.5	28.1	28.7	30.9	30.9	33.4	37.7	41.6	44.0	45.0	45.9
	Electric Power	kW	6.6	7.3	7.3	7.3	7.7	7.7	8.7	9.1	9.5	9.5	10.3	11.3	12.4	13.4	14	14.5
Overall Dimen-sions	Length	mm	4118	4216	4344	4405	4610	5095	5190	5593	5760	6247	6270	7110	7160	7860	8742	9542
	Width		1803	2023	2073	2130	2130	2280	2451	2475	2576	2590	2777	2854	2949	2978	3072	3072
	Height		2489	2687	2841	2900	2900	2857	3151	3234	3480	3654	3852	3816	4090	4225	4350	4350
Shipping Weight		t	8.0	10.0	10.9	11.2	13.4	14.4	16.5	19.7	21.7	24.0	26.3	29.7	34.8	39.2	44.6	48.9
Operating Weight			9.8	12.6	13.9	14.5	16.9	18.9	21.8	26.1	29.0	32.6	36.3	40.5	47.6	53.9	61.1	66.2

Notes

(1) The lowest outlet temprature of chilled water is 5℃.

(2) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

(3) Scale factor of chilled/cooling/hot water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(4) The maximum pressure bearing capacity of chilled/cooling/hot water box is 0.8 Mpa(G) for standard type and 1.6 Mpa(G) for High pressure type.

(5) The transportation rack is 180mm high. For chiller of HSB 496H2 and larger, the transportation rack is submerged type and 60mm high.

(6) The shipping weight includes the rack weight, exluding solution weight.balanced during handling.

Hot Water Operated Single Stage Lithium Bromide Absorption Chiller

6

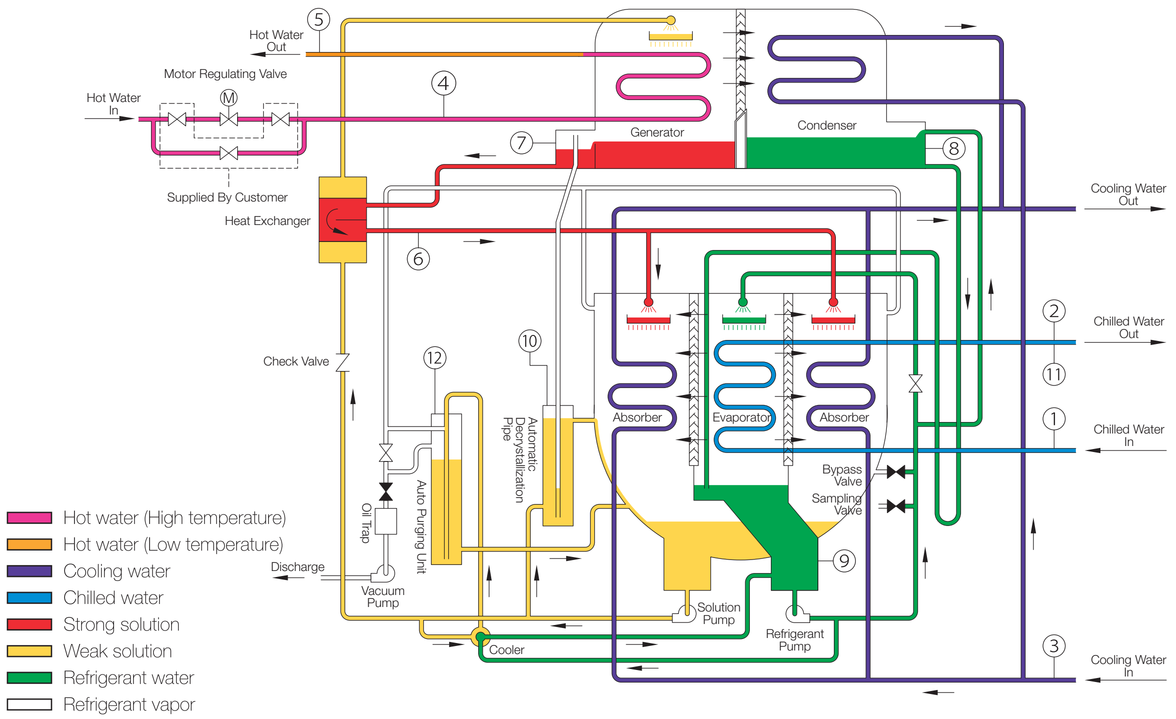
Hot water operated single effect lithium bromide absorption chiller is a kind of large-size refrigeration unit with low temperature hot water or waste water as the driving energy, lithium bromide solution as the absorbent and water as refrigerant instead of CFCS.

It can reduce greatly the cost for electricity and operation fees in regions where this source of energy is available. not only reduces greatly the electricity bill but also possess great economic potential in applications where this source of energy is available. By using this kind of chiller, waste hot water that is usually discharged or regarded as waste can be recovered.

Hot Water Operated Single Stage
Lithium Bromide Absorption Chiller

Working Principle

Cooling Cycle



① Chilled water inlet temp. (I)
② Chilled water outlet temp. (I,C,A)
③ Cooling water inlet temp. (I,C,A)
④ Hot water inlet temp. (I,C,A)
⑤ Hot water outlet temp. (I)
⑥ Solution spray temp. (I,C)
⑦ Strong solution outlet temp. (I,C,A)
⑧ Condensation temp. (I,C,A)
⑨ Evaporation temp. (I,A)
⑩ De-crystallization temp. (I,A)
⑪ Chilled water flow (A)
⑫ Vacuum pressure (I)

(C)—Control
(A)—Alarm
(I)—Indication

Evaporator Chilled water enters heat transfer tubes and evaporates refrigerant water which is dripped over the tubes. The produced chilled water goes into the external system. Refrigerant water absorbs heat from external system, becomes vapor and flows into absorber.

Absorber Strong solution drips over tubes, absorbing refrigerant vapor from evaporator and becoming weak solution. Cooling water from cooling tower enters heat transfer tubes to cool the strong solution distributed tubes and carries away heat from external system. After absorbing vapor, solution is diluted and sent into generator through heat exchanger.

Generator Weak solution heated by steam is concentrated into strong solution. The refrigerant vapor generated is condensed into refrigerant water, entering condenser.

Condenser Cooling water flows through tubes in condenser and condenses the vapor outside the tubes into refrigerant water. The produced refrigerant water enters evaporator through U pipe for cooling.

Heat Exchanger Strong solution from generator exchanges heat with that of weak solution from absorber.

Heat exchanger reduces the heat requirements of generator and the cooling water requirements. Performance of heat exchanger is critical for efficiency of chiller.

Technical Parameters

◆Hot Water Operated Single Stage LiBr Absorption Chiller

Model		HSA(95/85)-	99H2	165H2	265H2	331H2	413H2	496H2	579H2	661H2	744H2	827H2	992H2	1157H2	1323H2
Cooling Capacity		kW	349	582	930	1163	1454	1745	2035	2326	2617	2908	3489	4071	4652
		10^4kcal/h	30	50	80	100	125	150	175	200	225	250	300	350	400
		USRt	99	165	265	331	413	496	579	661	744	827	992	1157	1323
Chilled Water	Inlet/Outlet Temp.	℃	15 → 10												
	Flow Rate	m^3/h	60	100	160	200	250	300	350	400	450	500	600	700	800
	Pressure Loss	mH_2O	6.2	5.9	9.5	9.4	13.5	13.2	5.0	6.9	6.7	9.2	9.2	9.1	13.3
	Connection Diameter(DN)	mm	100	125	150	150	200	200	200	250	250	250	300	300	350
Cooling Water	Inlet/Outlet Temp.	℃	32 → 38												
	Flow Rate	m^3/h	112	186	298	372	465	558	651	744	837	930	1116	1302	1488
	Pressure Loss	mH_2O	6.8	7.0	5.3	5.2	6.4	7.0	7.7	8.7	9.3	11.0	11.1	10.8	14.9
	Connection Diameter(DN)	mm	125	150	200	250	250	250	300	300	300	350	400	400	400
Hot Water	Inlet/Outlet Temp.	℃	95 → 85												
	Consumption	t/h	36.9	61.5	98.4	123	153.8	184.5	215.3	246	276.8	307.5	369	430.5	492
	Pressure Loss	mH_2O	4.3	4.3	3.2	3.2	4.6	4.6	2.5	3.1	3.1	4.2	4.2	4.2	5.9
	Piping Diameter(DN)	mm	80	100	125	150	150	200	200	200	200	200	250	250	250
	Electric Modulating Valve Dia. (DN)	mm	65	80	125	125	150	150	150	200	200	200	250	250	250
Electrical Data	Power Supply	3Φ - 380VAC - 50Hz													
	Total Current	A	13.6	14.7	17.8	20.2	20.8	20.8	20.8	22.7	27.0	27.9	32.8	34.5	37.5
	Electric Power	kW	4.2	4.6	5.4	5.9	6.3	6.3	6.3	7.3	8.3	8.3	10	10.5	11.5
Overall Dimensions	Length	mm	3870	3860	4420	4535	5038	5080	5535	5935	5935	6635	6735	6745	7445
	Width		1526	1646	1786	1967	2081	2200	2239	2402	2408	2446	2635	2850	2869
	Height		2239	2541	2714	2860	2940	3080	3195	3315	3460	3460	3770	4170	4170
Shipping Weight		t	5.7	7.0	8.9	9.8	12.2	14.4	17.5	19.4	20.8	22.7	26.3	30.4	33.1
Operating Weight			7.2	9.2	12.2	14.1	17.4	20.6	24.3	26.7	29.0	32.3	37.6	44.0	47.7

Notes

(1) The lowest outlet temprature of chilled water is 5℃.

(2) Cooling capacity can be adjusted in the range of 20~100% , and chilled water can be adjusted in the range of 60~120%.

(3) Scale factor of chilled/cooling/hot water is 0.086m^2K/kW (0.0001m^2·h·℃/kcal).

(4) The maximum pressure bearing capacity of chilled/cooling/hot water box is 0.8 Mpa(G) for standard type and 1.6 Mpa(G) for High pressure type.

(5) The transportation rack is 180mm high. For chiller of HSB 579H2 and larger, the transportation rack is submerged type and 60mm high.

(6) The shipping weight includes the rack weight, exluding solution weight.balanced during handling.

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