Panasonic

WASTE HEAT · EXHAUST GAS RECLAIM CHILLER

- ENERGY SAVING AND EMISSION REDUCTION
- WASTE HEAT UTILIZATION
- CLEAN ENERGY TECHNOLOGY
- COMPREHENSIVE UTILIZATION OF COMPOSITE ENERGY

Company profile

Business scope:

Designs, productions, manufactures, sales, installations, and after-sale services for chillers featuring environmental protection and energy-integrated utilization, for air-conditioning machinery, and for related environmental protection machinery, etc.

Product kinds:

Central air-conditioning equipment: absorption chiller/heater — sole refrigeration or refrigeration and heating (70~23256kW).
Steam-fired, direct-fired, hot water-fired, modular type, packaged type, heat pump type, etc.

Commercial air-conditioning equipment: GHP gas heat pump and chiller unit — refrigeration and heating (16HP-50HP).
VRF variable refrigerant flow unit — refrigeration and heating (4HP-60HP).

Heating equipment: vacuum boiler — heating and hot water supplying (80, 000~6,000,000kcal/h).

Application:

Central air-conditioning equipment: mainly provide heating and cooling source for large scale central air conditioning system and other places needing chilled or hot water, widely applied in building, hotel, department store, cinema, stadium, factory and oil field, etc.

Commercial air-conditioning equipment: widely applied in places needing air conditioning equipments, such as small and middle scale department store, hotel, building, entertainment place, hospital, factory, domitory, residence, school,etc.

Heating equipment: widely applied in hotel, department store, residence, villa, bath house , advanced swimming pool, etc., where needing heating and hot water, used with absorption chiller, it will be ideal for cooling, heating and hot water supplying.

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The main equipment of fume,hot water energy source reclaim

- combustion turbine,internal-combustion engine,steam turbine, fuel battery, coal fire etc which produce fume hot water

- exhaust-heat boiler

- heat exchanger

- LiBr Absorption Chiller/Heater

1. Steam-fired chiller ⇨ Provide heating or cooling by use 0.1-8kg/cm^2 G exhaust gas as energy source

2. Low temperature water type ⇨ Provide heating or cooling by use hot water below 100℃ as energy source which produce by internal-combustion or other irdustry equipment

3. Low temperature water/ direct-fired single, double-effect type ⇨ (1) First,provide heating or cooling by use hot water below 100℃ which produced by generator or other irdustry equipment
(2) Second.If the hot water is not enough, it can be afterburning by nature gas, light oil.

4. Low temperature water /steam-fired single,double-effect type ⇨ (1) First,provide heating or cooling by use hot water below 100℃ which produced by generator or other industry equipment
(2) Second. If the hot water is not enough. It can use steam as auxilary source of heat.

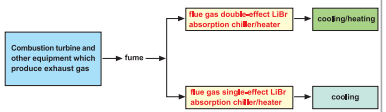
5.Flue gas LiBr absorplion chiller ⇨ (1) Flue gas single-effect chiller→provide cooling by use flue gas below 300℃ which produced by electric generator or other industry equipment.
(2) Flue gas double-effect chiller→provide cooling or heating by use flue gas above 300℃ which produced by combustion turbine, internal-combustion engine or other industrial equipment.
(3) Flue gas hot water chiller→provide cooling or heating by use flue gas or waste hot water which produced by internal-combustion engine of other equipment.
(4) Flue gas afterburning chiller→ Provide cooling or hearting by use flue gas which produced by internal combustion engine or other industrial equipment, when the flue gas is not enough, will utilize natural gas.
(5) Flue gas hot water afterburning chiller→Provide cooling or hearting by use flue gas or hot water which produced by internal combustion engine or other industrial equipment, when the flue gas is not enough,will utilize natural gas.

Contents

The reclaim mode of fume, hot water

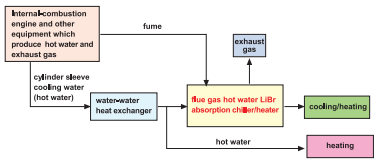
The reclaim mode of fume, hot water

1 Use flue gas LiBr absorption chiller to reclaim the waste heat



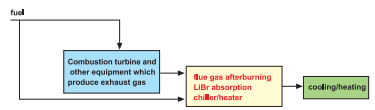
Remarks: For detail see following information or contact us

2 Use flue gas hot water LiBr absorption chiller to reclaim the waste heat



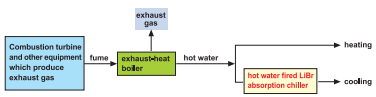
Remarks: For detail see following information or contact us

3 Use flue gas afterburning LiBr absorption chiller to reclaim the wast heat



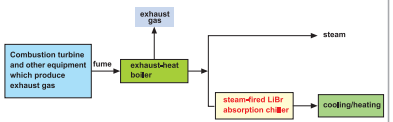
Remarks: For detail see following information or contact us

4 Use exhaust-heat boiler+hot water fired LiBr absorption chiller to reclaim the waste heat



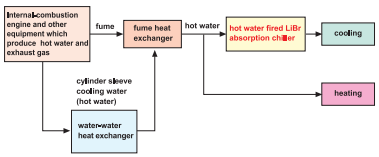
Remarks: For detail see <hot water LiBr absorption chiller>

5 Use exhaust heat boiler+steam fired LiBr absorption chiller



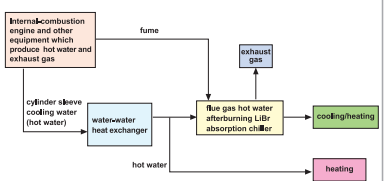
Remarks: For detail see <steam-dired LiBr absorption chiller>

6 Use fume heat exchanger+hot water fired LiBr absorption chiller to reclaim the waste heat



Remarks: For detail see <hot water LiBr absorption chiller>

7 Use flue gas hot water afterburning LiBr absorption chiller to reclaim the waste heat



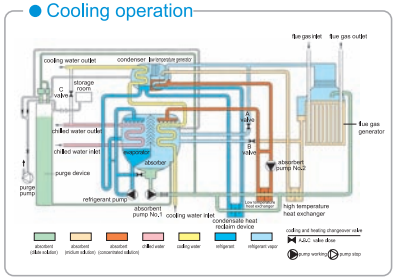
Remarks: For detail see following information or contact us

Flow diagram

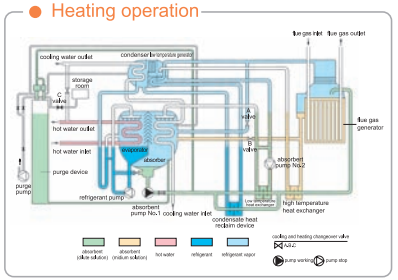
Flue gas double-effect LiBr absorption chiller/heater

Flue gas double-effect LiBr absorption chiller is made of evaporator,absorber,condenser,low temperature generator,flue gas generator,refrigerant condensate heat reclaim device,high temperature heat exchanger,low temperature heat exchanger,solution pump etc.

Cooling operation



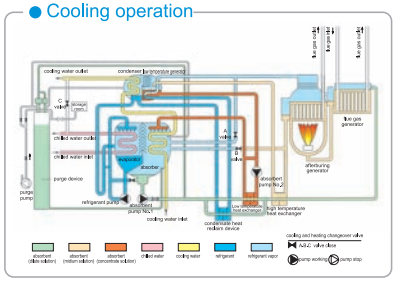
Heating operation



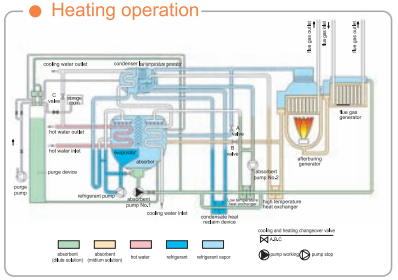
Flue gas + direct fired LiBr absorption chiller/heater

Flue gas + direct fired LiBr absorption chiller is made of evaporator,absorber,low temperature generator,condenser,flue gas generator,afterburning generator,low temperature heat exchanger,high temperature heat exchanger,condensate heat reclaim device,refrigerant pump,solution pump,three way valve,purge device,etc.

Cooling operation



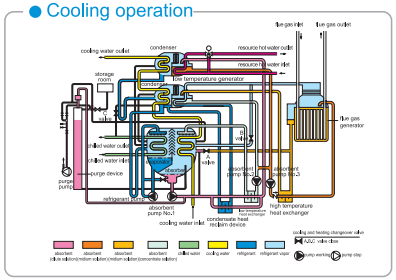
Heating operation



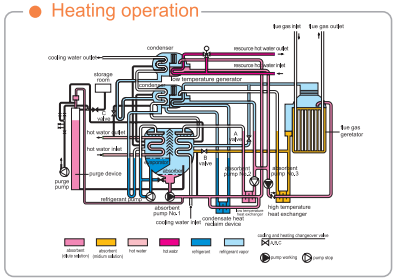
Flue gas hot water LiBr absorption chiller/heater

Flue gas hot water LiBr absorption chiller is made of evaporator,absorber,low temperature water condenser,low temperature water genarator, condenser,low temperature generator,flue gas generator,refrigerant condensate heat reclaim device,high temperature heat exchanger,low temperature heat exchanger,refrigerant pump,solution pump, hot water three-way valve,purge device etc.

Cooling operation



Heating operation



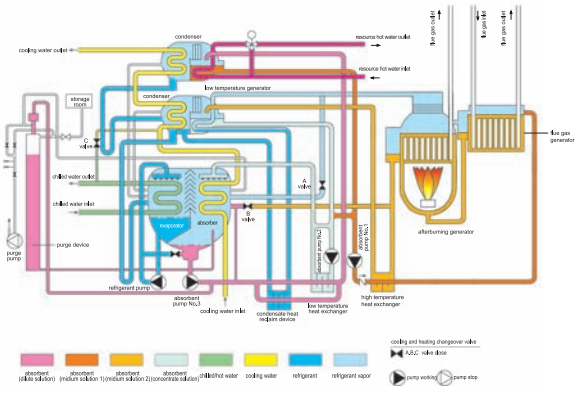
Flow diagram

Flue gas hot water afterburning LiBr absorption chiller

Flue gas hot water afterburning LiBr absorption chiller is made of evaporator ,absorber, low temperature generator ,condenser ,low temperature water Condenser, low temperature water generator ,flue gas generator,afterburning generator,low temperature heat exchanger ,high temperature generator, refrigerant condensate heat reclaim device ,refrigerant pump ,solution pump ,hot water three-way valve ,purge device and connect pipe.

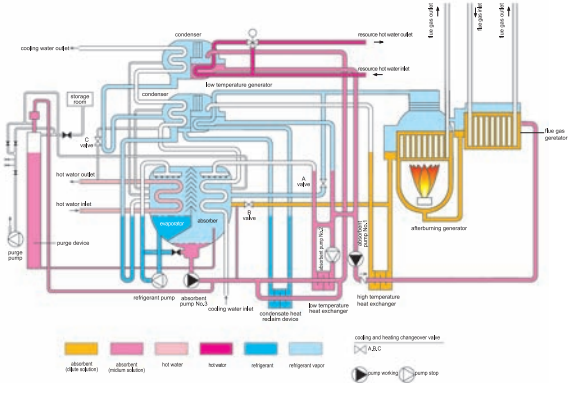
Cooling operation

Principle of operation ,dilute solution in absorber is pumped through refrigerant condensate heat reclaim device , low temperature heat exchanger by NO.3 absorbent pump and go low temperature water generator ,the dilute solution is heated by hot water from cylinder sleeve of engine.The dilute solution from low temperature water generator is pumped through high temperature heat exchanger to flue gas generator ,then go afterburning generator by NO.1 absorbent pump, become medium solution .the medium solution go through high temperature heat exchanger to low temperature generator is heated by refrigeration steam from flue gas generator and afterburning generator become condensate solution .the condensate solution is pumped through low temperature heat exchanger ,with temperature drop to absorber and dripped on the cooling water tube by NO.2 absorbent pump, absorb the refrigerant steam from evaporator, become dilute solution .on the other hand,the refrigerant vapor produced by external heat resource heat the LiBr solution in the flue gas generator and afterburning generator enter into low temperature generator and heat the medium solution ,then itself coagulated into refrigerant,the temperature goes down when the refrigerant through refrigerant condensate heat claim device ,the refrigerant float into condenser with refrigerant vapor from low temperaturegenerator ,in the meaning time refrigerant vapor from low temperature water generator is cooled when it enter into low temperature water condenser, then enter into condenser ,and the refrigerant mix up ,the refrigerant is decompressed and throttled ,then enter into evaporator where it dripped on the chilled water tube ,cool the chilled water in the evaporator.
Above process circles again and again for producing chilled water continuously .



Heating operation

Dilute solution is heated in flue gas generator and afterburning generator and produced refrigerant vapor go to evaporator and absorber and exchange heat in evaporator to get hot water , and medium solution goes into absorber and mixes with refrigerant ,then the solution become dilute solution. The dilute solution goes through low temperature exchanger , refrigerant condensate heat reclaim device,low temperature water generator ,high temperature heat exchanger ,and return flue gas generator and afterburning generator. Above process circles again and again for producing hot water continuously .



Order and installation scope

Order and installation scope

	item	delivery	customer	notes
Body	Flue gas double-effect or flue gas hot water or flue gas afterburning or flue gas hot water afterburning absorption chiller	○		Refer to following table
Transport	From the factory to the building		○	
	From the building to the foundation site		○	
	Installation of chiller/heater		○	
	Testing and adjusting at site	●	○	The customer responsible for render energy source and water, clear the pipe of water system
	Operating direction	○		
Electric construction	External wire allocation		○	Please let the wire arrive in control panel wiring point
	Cooling water temperature control device		○	Please install and wire for the thermostat used by start-stop fan of cooling tower or for the thermostat of cooling water control valve.
	Flue gas control valve and draught fan wire		○	Please wire the flue gas control valve, draught fan, power cord into the control panel connecting terminal
	Three-way valve wire		○	Please wire the three-way valve, power cord into the control panel connecting terminal (suit for flue gas hot water or flue gas hot water afterburning chiller)
Other construction	Foundation construction		○	Exclusive of foundation bolts, weld the frame and washer when fixing foundation bolts.
	External pipe construction		○	
	Prevent to cooling water,hot water,chilled water pipe freezing		○	It must prevent to cooling water, hot water, chilled water pipe freezing in winter
	The quality of cooling water management		○	Please install drain water system, so it can properly process the water
	The quality of hot water management		○	Suit for flue gas hot water or flue gas hot water afterburning chiller
	Insulation work construction		○	
Painting	First coat of body	○		
	Painting of control panel	○		
Others	Assemble power, water, cement, etc, at site		○	
	Power, water, fuel, etc, used during testing operation		○	
	LiBr solution and refrigerating medium	○		
Maintenance	Service after sale maintenance	●		When the guarantee time expired, you can sigh the maintenance contract with us and negotiate with us about the detail.

Flue gas double-effect absorption chiller main body include

1. Flue gas double-effect LiBr absorption chiller
(a) evaporator,absorber,low temperature generator,condenser,flue gas generator,low temperature heat exchanger,high temperature heat exchanger,condensate heat exchanger,refrigerant pump,solution pump,purge pump.
(b) palladium pipe automatic purge device
(c) capacity control device
(d) safety device
(e) control panel
(f) internal pipe and electric wiring

2. accessory
(a) foundation bolts and washers·····1 set
(b) instruction manual·····1 set
● extra charge should be calculated separately if required

Flue gas hot water absorption chiller main body include

1. Flue gas hot water LiBr absorption chiller
(a) evaporator,absorber,low temperature water condenser,low temperature generator,condenser,low temperature water generator,flue gas generator,low temperature heat exchanger,high temperature heat exchanger,condensate heat exchanger,refrigerant pump,solution pump, purge pump.
(b) Palladium pipe automatic purge device.
(c) capacity control device
(d)hot water control valve
(e) safety device
(f) control panel
(g) internal pipe and electric wiring

2. accessory
(a) foundation bolts and washers·····1 set
(b) instruction manual·····1 set
● extra charge should be calculated separately if required

Flue gas - afterburning LiBr absorption chiller

1. Flue gas afterburning LiBr absorption chiller
(a) evaporator,absorber,low temperature generator,condenser,flue gas generator,afterburning generator,low temperature heat exchanger,high temperature heat exchanger,condensate heat exchanger,refrigerant pump,solution pump purge pump.
(b) palladium pipe automatic purge device
(c) combustion equipment including burner,air blower and safety-burning device,etc.
(d) capacity control device
(e) safety device
(f) control panel
(g) internal pipe and electric wiring

2. accessory
(a) foundation bolts and washers·····1 set
(b) instruction manual·····1 set
● extra charge should be calculated separately if required

Flue gas hot water afterburning absorption chiller main body include

1. Flue gas afterburning LiBr absorption chiller
(a) Evaporator,absorber,low temperature generator,condenser,flue gas generator,afterburning generator,low temperature heat exchanger,high temperature heat exchanger,condensate heat exchanger,refrigerant pump,solution pump, purge pump.
(b) palladium pipe automatic purge device
(c) combustion equipment including burner,air blower and safety-burning device,etc.
(d) hot water control vavle
(e) capacity control device
(f) safety device
(g) control panel
(h) internal pipe and electric wiring

2. accessory
(a) foundation bolts and washers·····1 set
(b) instruction manual·····1 set
● extra charge should be calculated separately if required

Specification

● Flue gas double-effect LiBr absorption chiller/heater

model		YP-**LHB	11	12	13	14	21	22	23
refrigeration capacity		USRT	100	120	150	180	210	240	280
		kW	352	422	527	633	738	844	985
		10^4kcal/h	30.2	36.3	45.4	54.4	63.5	72.6	84.7
heating capacity		kW	282	338	423	506	590	675	788
		10^4kcal/h	24.2	29.0	36.3	43.5	50.8	58.1	67.7
chilled water system	inlet/outlet temperature	℃	12→7						
	flow rate	m^3/h	60.5	72.6	90.7	108.9	127.0	145.2	169.3
	pressure drop	mH_2O	6.2	6.4	8.6		7.5	8.1	5.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
hot water system	inlet/outlet temperature	℃	56→60						
	flow rate	m^3/h	60.5	72.6	90.7	108.9	127.0	145.2	169.3
	pressure drop	mH_2O	6.2	6.4	8.6		7.5	8.1	5.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
cooling water system	inlet/outlet temperature	℃	32→37.5						
	flow rate	m^3/h	94	113	141	170	198	226	264
	pressure drop	mH_2O	4.3	4.8	6.6	7.6	5.8	6.4	11.7
	inlet/outlet diameter	A	DN125				DN150		DN200
	maximum working pressure	MPa	0.8						
power	power supply		3phase、380V、50Hz						
	total electric current	A	10.9		14.2		14.3		17.3
	wire area	mm^2	4.0						
	power consumption	kVA	13.6						13.7
motor rated power	No.1 absorbent pump	kW(A)	1.3(3.5)		2.5(6.8)				3.4(9.1)
	No.2 absorbent pump	kW(A)	1.1(3.9)				1.3(4.0)		
	refrigerant pump	kW(A)	0.2(1.3)						0.4(1.8)
	purge pump	kW(A)	0.4(1.2)						
flue gas systrm	inlet diameter	A	DN250		DN300	DN350	DN400		DN450
	outlet diameter	A	DN250		DN300	DN350	DN400		DN450
	maximum consumption	kg/h	2,400	2,880	3,600	4,320	5,040	5,760	6,720
	pressure drop	mmH_2O	100	150	105	100	95	130	105
weight	operation weigit	ton	5.5	6.1	7.6	8.3	9.6	10.0	11.3
	Max. moving weight	ton	5.1	5.6	7.1	7.7	8.8	9.2	10.4
	total weight	ton	5.1	5.6	7.1	7.7	8.8	9.2	10.4
	moving state		one section						
overall dimension	length	mm	2,670	2,790	3,690		3,710		4,760
	width	mm	1,990		2,140		2,365		2,650
	height	mm	2,065		2,065		2,260		2,260
clearance		mm	2,400		3,400				4,500

(1) Fule gas rated inlet temperature:500℃
(2) Minimum temperature of chilled water outlet:5℃
(3) Normal working, minimum inlet temperature of cooling water:19℃
(4) Adjustable range of chilled water flow:50%~120%
(5) Adjustable range of cooling water flow: 50%~120%
(6) The species of the LiBr absorption chiller is different according to the waste heat /exhaust gas, if you want to know the detail, you can contact us.

Specification

24	31	32	41	42	51	52	53
320	360	400	450	500	560	630	700
1,125	1,266	1,407	1,582	1,758	1,969	2,215	2,461
96.8	108.9	121.0	136.1	151.2	169.3	190.5	211.7
900	1,013	1,126	1,266	1,406	1,575	1,772	1,969
77.4	87.1	96.8	108.9	121.0	135.5	152.4	169.3
12→7							
193.5	217.7	241.9	272.2	302.4	338.7	381.0	423.4
5.7	6.2	6.6	5.7	5.1	4.5	6.1	8.0
DN150			DN200				
0.8							
56→60							
193.5	217.7	241.9	272.2	302.4	338.7	381.0	423.4
5.7	6.2	6.6	5.7	5.1	4.5	6.1	8.0
DN150			DN200				
0.8							
32→37.5							
302	339	377	424	471	528	594	660
12.6	9.6	10.2	10.8	11.3	8.2	11.3	14.3
DN200			DN250		DN300		
0.8							
3phase、380V、50Hz							
17.3			18.7		24.6		
4.0					6.0		
13.7			14.9		19.7		
3.4(9.1)					3.7(15.0)		
1.3(4.0)			1.8(5.4)				
0.4(1.8)							
0.4(1.2)							
DN450	DN500				1,100×460		1,100×460
DN450	DN500				1,100×460		1,100×460
7,680	8,640	9,600	10,800	12,000	13,440	15,120	16,800
140	115	145	135	170	110	145	160
11.9	14.6	15.2	18.2	19.6	24.1	27.0	28.9
10.9	13.4	13.9	16.6	18.0	11.4	12.1	13.0
10.9	13.4	13.9	16.6	18.0	21.5	24.2	26.0
one section					moving separately		
4,760	4,830		4,850		5,070	5,590	6,080
2,650	2,870		3,100		3,710		
2,260	2,475		2,750		3,015		
4,500					4,600	5,200	5,700

(7) If you need outline dimension drawing,please contact us.
(8) "A"stands for nominal diameter,unit mm.
(9) Standard: JISB 8622
(10)The data will be modified without notice for technique improvement.

Specification

● Flue gas- afterburning LiBr absorption chiller/heater

model		YP-**LHC	11	12	13	14	21	22	23
refrigeration capacity	flue gas afterburning operation together	USRT	100	120	150	180	210	240	280
		kW	352	422	527	633	738	844	985
		10^4kcal/h	30.2	36.3	45.4	54.4	63.5	72.6	84.7
	flue gas or afterburning operation	kW	352	422	527	633	738	844	985
heating capacity	flue gas+afterburning operate together/ afterburning operate singly	kW	294	353	441	530	618	706	824
	flue gas fired operate singly	kW	282	338	423	506	590	675	788
chilled water system	inlet/outlet temperature	℃	12→7						
	flow rate	m^3/h	60.5	72.6	90.7	108.9	127.0	145.2	169.3
	pressure drop	mH₂O	6.2	6.4	8.6		7.5	8.1	5.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
hot water system	inlet/outlet temperature	℃	55.8→60 (flue gas+direct fired operate together/direct fired operate singly)/56→60 (flue gas fired operate singly)						
	flow rate	m^3/h	60.5	72.6	90.7	108.9	127.0	145.2	169.3
	pressure drop	mH₂O	6.2	6.4	8.6		7.5	8.1	5.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
cooling water system	inlet/outlet temperature	℃	32→37.5						
	flow rate	m^3/h	94	113	141	170	198	226	264
	pressure drop	mH₂O	4.3	4.8	6.6	7.6	5.8	6.4	11.7
	inlet/outlet diameter	A	DN125				DN150		DN200
	maximum working pressure	MPa	0.8						
power	power supply		3 phase、380V、50Hz						
	total electric current	A	11.8		15.8		17.4		20.3
	wire area	mm^2	4.0						
	power consumption	kVA	9.3		12.6		13.9		16.3
motor rated power	No.1 absorbent pump	kW(A)	1.3(3.5)		2.5(6.8)				3.4(9.1)
	No.2 absorbent pump	kW(A)	1.1(3.9)				1.3(4.0)		
	refrigerant pump	kW(A)	0.2(1.3)						0.4(1.8)
	purge pump	kW(A)	0.4(1.2)						
	air blower	kW(A)	0.4(1.0)		0.75(1.7)		1.5(3.2)		
flue gas system	inlet diameter	A	DN250		DN300	DN350	DN400		DN450
	outlet diameter	A	DN250		DN300	DN350	DN400		DN450
	maximum consumption	kg/h	2,400	2,880	3,600	4,320	5,040	5,760	6,720
	pressure drop	mmH₂O	100	150	105	100	95	130	105
Fuel	Consumption(Cooling)	Nm^3/h	20.8	25.0	31.2	37.5	43.7	50.0	58.3
	Consumption(Heating)	Nm^3/h	24.5	29.5	36.8	44.2	51.5	58.9	68.7
	flue connection size	mm	280×210				310×310		
weight	operation weigit	ton	7.5	8.2	10.1	10.8	12.5	13.1	14.8
	Max. moving weight	ton	7.1	7.7	9.5	10.2	11.7	12.3	13.9
	total weight	ton	7.1	7.7	9.5	10.2	11.7	12.3	13.9
	moving state		one section						
overall dimension	length	mm	3,870	3,930	4,790	4,950	5,620	5,810	5,800
	width	mm	2,230		2,330		2,600		2,790
	height	mm	2,425	2,500	2,465		2,530		2,610
clearance		mm	2,400		3,400				4,500

(1) Fule gas rated inlet temperature:500℃
(2) Minimum temperature of chilled water outlet:5℃
(3) Normal working, minimum inlet temperature of cooling water:19℃
(4) Adjustable range of chilled water flow:50%~120%
(5) Adjustable range of cooling water flow: 50%~120%
(6) The afterburning or flue gas operate seperately can meet the 100% capacity of the standard type. If you have other requestment,please contact us.
(7) The species of the LiBr absorption chiller is different according to the waste heat /exhaust gas, if you want to know the detail, you can contact us.

Specification

24	31	32	41	42	51	52	53
320	360	400	450	500	560	630	700
1,125	1,266	1,407	1,582	1,758	1,969	2,215	2,461
96.8	108.9	121.0	136.1	151.2	169.3	190.5	211.7
1,125	1,266	1,407	1,582	1,758	1,969	2,215	2,461
941	1,059	1,177	1,324	1,471	1,647	1,853	2,059
900	1,013	1,126	1,266	1,406	1,575	1,772	1,969
12→7							
193.5	217.7	241.9	272.2	302.4	338.7	381.0	423.4
5.7	6.2	6.6	5.7	5.1	4.5	6.1	8.0
DN150			DN200				
0.8							
55.8→60 (flue gas+direct fired operate together/direct fired operate singly)/56→60 (flue gas fired operate singly)							
193.5	217.7	241.9	272.2	302.4	338.7	381.0	423.4
5.7	6.2	6.6	5.7	5.1	4.5	6.1	8.0
DN150			DN200				
0.8							
32→37.5							
302	339	377	424	471	528	594	660
12.6	9.6	10.2	10.8	11.3	8.2	11.3	14.3
DN200			DN250		DN300		
0.8							
3 phase、380V、50Hz							
20.3			23.1		30.3		
4.0			6.0		10.0		
16.3			18.6		24.4		
3.4(9.1)					3.7(13.4)		
1.3(4.0)			1.8(5.4)				
0.4(1.8)							
0.4(1.2)							
1.5(3.2)			2.2(4.6)		3.7(7.3)		
DN450	DN500				1,100×460		1,100×460
DN450	DN500				1,100×460		1,100×460
7,680	8,640	9,600	10,800	12,000	13,440	15,120	16,800
140	115	145	135	170	110	145	160
66.6	75.0	83.3	93.7	104.1	116.6	131.2	145.8
78.5	88.4	98.2	110.5	122.7	137.5	154.6	171.8
310×310	360×310		410×310		350×500		
15.5	19.1	20.2	23.7	25.7	30.8	34.3	36.7
14.6	17.9	18.9	22.2	24.1	11.5	12.3	13.2
14.6	17.9	18.9	22.2	24.1	28.3	31.5	33.8
one section					moving separately		
5,880	6,050	6,320	6,500	6,770	6,085	6,505	6,885
2,790	2,890		3,050		3,895		
2,610	2,950		3,200		3,490		
4,500					4,600	5,200	5,700

(8) If you need outline dimension drawing,please contact us.
(9) The capacity of air blast will be different according to different burner.
(10) The calorific in the table is natural gas, the value is low calorific value: 11000 kcal/Nm^3
The actual consumption of fuel=the calorific value in the table×consumption in the table/low calorific value of fuel
(11) "A"stands for nominal diameter,unit mm.
(12) Standard: JISB 8622
(13) The data will be modified without notice for technique improvement.

Specification

● Flue gas hot water LiBr absorption chiller/heater

model		YP-**LHD	11	12	13	14	21	22	23	24
refrigeration capacity	single and double effect	USRT	90	108	135	162	189	216	252	288
		kW	317	380	475	570	665	760	887	1,014
		10^4kcal/h	27.2	32.7	40.8	49.0	57.2	65.3	76.2	87.1
	single effect	USRT	27	32	41	49	57	65	76	86
	double effect	USRT	63	76	95	113	132	151	176	202
heating capacity		kW	178	213	266	320	373	426	497	568
		10^4kcal/h	15.3	18.3	22.9	27.5	32.0	36.6	42.7	48.8
chilled water system	inlet/outlet temperature	℃	12→7							
	flow rate	m^3/h	54.4	65.3	81.6	98.0	114.3	130.6	152.4	174.2
	pressure drop	mH_2O	5.0	5.2	7.0		6.1	6.6	4.3	4.6
	inlet/outlet diameter	A	DN100				DN125		DN150	
	maximum working pressure	MPa	0.8							
hot water system	inlet/outlet temperature	℃	57.2→60							
	flow rate	m^3/h	54.4	65.3	81.6	98.0	114.3	130.6	152.4	174.2
	pressure drop	mH_2O	5.0	5.2	7.0		6.1	6.6	4.3	4.6
	inlet/outlet diameter	A	DN100				DN125		DN150	
	maximum working pressure	MPa	0.8							
cooling water system	inlet/outlet temperature	℃	32→37.7							
	flow rate	m^3/h	92.1	110.5	138.1	165.8	193.4	221.0	257.8	294.7
	pressure drop	mH_2O	9.1	6.3	9.4	11.6	9.2	10.3	17.6	20.3
	inlet/outlet diameter	A	DN125				DN150		DN200	
	maximum working pressure	MPa	0.8							
hot water (heat source)	inlet/outlet temperature	℃	95→85							
	flow rate	m^3/h	12.0	14.5	18.1	21.7	25.3	28.9	33.7	38.6
		ton/h	11.7	14.0	17.5	21.0	24.5	28.0	32.7	37.3
	pressure drop	mH_2O	0.9		1.6		1.2	1.0	2.2	1.6
	inlet/outlet diameter	A	DN65				DN100			
	maximum working pressure	MPa	0.8							
power	power supply		3phase、380V、50Hz							
	total electric current	A	14.3		20.6		20.7		23.7	
	wire area	mm^2	4.0						6.0	
	power consumption	kVA	11.3		16.5		16.6		19.0	
motor rated power	No.1 absorbent pump	kW(A)	1.3(3.5)		2.5(6.8)				3.4(9.1)	
	No.2 absorbent pump	kW(A)	1.1(3.9)				1.3(4.0)			
	No.3 absorbent pump	kW(A)	1.1(3.4)		2.2(6.4)					
	refrigerant pump	kW(A)	0.2(1.3)						0.4(1.8)	
	purge pump	kW(A)	0.4(1.2)							
flue gas system	inlet diameter	A	DN250				DN300	DN350	DN400	
	outlet diameter	A	DN250				DN300	DN350	DN400	
	maximum consumption	kg/h	1,512	1,814	2,268	2,722	3,175	3,629	4,234	4,838
	pressure drop	mmH₂O	65	95	100	130	105	100		130
weight	operation weigit	ton	5.9	6.8	8.3	8.9	10.4	11.1	13.5	14.1
	Max. moving weight	ton	5.5	6.3	7.8	8.3	9.7	10.3	12.6	13.2
	total weight	ton	5.5	6.3	7.8	8.3	9.7	10.3	12.6	13.2
	moving state		one section							
overall dimension	length	mm	2,720		3,740		3,770		4,845	
	width	mm	2,040				2,300		2,400	
	height	mm	2,625	2,750	2,730		2,925		2,985	
clearance		mm	2,400		3,400				4,500	

(1) Fule gas rated inlet temperature:500℃
(2) Minimum temperature of chilled water outlet:5℃
(3) Normal working, minimum inlet temperature of cooling water:19℃
(4) Adjustable range of chilled water flow:50%~120%
(5) Adjustable range of cooling water flow: 50%~120%
(6) The species of the LiBr absorption chiller is different according to the waste heat /exhaust gas, if you want to know the detail, you can contact us.

Specification

31	32	41	42	51	52	53	61	62	63
324	360	405	450	504	567	630	720	810	900
1,140	1,267	1,426	1,584	1,774	1,996	2,218	2,534	2,851	3,168
98.0	108.9	122.5	136.1	152.4	171.5	190.5	217.7	244.9	272.2
97	108	122	135	151	170	189	216	243	270
227	252	284	315	353	397	441	504	567	630
639	710	799	888	995	1,119	1,243	1,421	1,598	1,776
54.9	61.0	68.7	76.3	85.4	96.1	106.8	122.1	137.3	152.6
12→7									
196.0	217.7	244.9	272.2	304.8	342.9	381.0	435.5	489.9	544.3
5.0	5.3	4.6	4.1	3.6	4.9	6.5	4.5	6.0	7.9
DN150		DN200					DN250		
0.8									
57.2→60									
196.0	217.7	244.9	272.2	304.8	342.9	381.0	435.5	489.9	544.3
5.0	5.3	4.6	4.1	3.6	4.9	6.5	4.5	6.0	7.9
DN150		DN200					DN250		
0.8									
32→37.7									
331.5	368.3	414.4	460.4	515.7	580.1	644.6	736.7	828.8	920.8
14.6	16.3	16.4	18.2	9.6	10.0	7.8	9.6	12.9	10.7
DN200		DN250		DN300			DN350		
0.8									
95→85									
43.4	48.2	54.2	60.2	67.5	75.9	84.3	96.4	108.4	120.5
42.0	46.7	52.5	58.3	65.3	73.5	81.6	93.3	105.0	116.6
2.4	1.8	1.6	1.8	1.8	2.3	2.7	2.6	3.4	3.0
DN100		DN125		DN150					
0.8									
3phase、380V、50Hz									
23.7		28.2		34.1			39.8	43.8	
6.0				10.0				16.0	
19.0		22.7		27.5			32.1	35.4	
3.4(9.1)				3.7(15.0)			5.5(15.0)	5.5(19.0)	
1.3(4.0)		1.8(5.4)					1.8(6.4)		
2.2(9.5)							4.5(14.0)		
0.4(1.8)									
0.4(1.2)									
DN400	DN450		DN500				1,100×460		1,100×460
DN400	DN450		DN500				1,100×460		1,100×460
5,443	6,048	6,804	7,560	8,467	9,526	10,584	12,096	13,608	15,120
130	105	140	115	145	135	170	110	145	160
16.5	17.0	19.2	20.2	25.3	27.9	30.6	36.7	40.7	44.9
15.3	15.7	17.7	18.5	14.0	15.2	16.0	16.0	17.6	18.6
15.3	15.7	17.7	18.5	22.8	25.2	27.7	32.9	36.7	40.6
one section				moving separately					
4,970		4,975		5,100	5,740	6,230	5,785	6,280	6,650
2,500	2,750	2,840	3,050	3,300	3,520		4,260		
3,290		3,565		3,830			4,390		4,430
4,500				4,600	5,200	5,700	5,200	5,700	6,200

(7) If you need outline dimension drawing, please contact us.
(8) "A"stands for nominal diameter,unit mm.
(9) Standard: JISB 8622
(10) The data will be modified without notice for technique improvement.

Specification

● Flue gas hot water afterburning LiBr absorption chiller

model		YP-**-LHE	11	12	13	14	21	22	23
refrigeration capacity	afterburning operate singly or together	USRT	90	108	135	162	189	216	252
		kW	317	380	475	570	665	760	886
		10^4kcal/h	27.2	32.7	40.8	49.0	57.2	65.3	76.2
	flue gas operate singly	USRT	63	76	95	113	132	151	176
	hot water operate singly	USRT	27	32	41	49	57	65	76
heating capacity	afterburning operate singly or together	kW	265	318	397	477	556	635	741
	flue gas operate singly	kW	178	213	266	319	373	426	497
chilled water system	inlet/outlet temperature	℃	12→7						
	flow rate	m^3/h	54.4	65.3	81.6	98.0	114.3	130.6	152.4
	pressure drop	mH_2O	5.0	5.2	7.0		6.1	6.6	4.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
hot water system	inlet/outlet temperature	℃	55.8→60						
	flow rate	m^3/h	54.4	65.3	81.6	98.0	114.3	130.6	152.4
	pressure drop	mH_2O	5.0	5.2	7.0		6.1	6.6	4.3
	inlet/outlet diameter	A	DN100				DN125		DN150
	maximum working pressure	MPa	0.8						
cooling water system	inlet/outlet temperature	℃	32→37.7						
	flow rate	m^3/h	92.1	111	138	166	193	221	258
	pressure drop	mH_2O	4.7	5.3	7.8	8.7	7.0	7.7	14.6
	inlet/outlet diameter	A	DN125				DN150		DN200
	maximum working pressure	MPa	0.8						
hot water (heat source)	inlet/outlet temperature	℃	95→85						
	flow rate	m^3/h	12.0	14.5	18.1	21.7	25.3	28.9	33.7
		ton/h	11.7	14.0	17.5	21.0	24.5	28.0	32.7
	pressure drop	mH_2O	0.9		1.6		1.2	1.0	2.2
	inlet/outlet diameter	A	DN65				DN100		
	maximum working pressure	MPa	0.8						
power	power supply		3phase、380V、50Hz						
	total electric current	A	15.9		22.2		23.8		26.7
	wire area	mm^2	4.0				6.0		
	power consumption	kVA	12.7		17.9		19.2		21.5
motor rated power	No.1 absorbent pump	kW(A)	1.3(3.5)		2.5(6.8)				3.4(9.1)
	No.2 absorbent pump	kW(A)	1.1(3.9)				1.3(4.0)		
	No.3 absorbent pump	kW(A)	1.1(3.4)		2.2(6.4)				
	refrigerant pump	kW(A)	0.2(1.3)						0.4(1.8)
	purge pump	kW(A)	0.4(1.2)						
	air blower	kW(A)	0.75(1.7)				1.5(3.2)		
flue gas system	inlet diameter	A	DN250				DN300	DN350	DN400
	outlet diameter	A	DN250				DN300	DN350	DN400
	maximum consumption	kg/h	1,512	1,814	2,268	2,722	3,175	3,629	4,234
	pressure drop	mmH_2O	65	95	100	130	105	100	
fuel	consumption (cooling)	Nm^3/h	18.7	22.5	28.1	33.8	39.3	45.0	52.5
	consumption (heating)	Nm^3/h	22.1	26.6	33.1	39.8	46.4	53.0	61.8
	flue connection size	mm	280×210				310×310		
weight	operation weigit	ton	7.7	8.6	10.5	11.1	13.1	14.1	16.8
	Max. moving weight	ton	7.2	8.1	9.9	10.5	12.4	13.2	15.9
	total weight	ton	7.2	8.1	9.9	10.5	12.4	13.2	15.9
	moving state		one section						
overall dimension	length	mm	2,720		3,740		3,770		4,845
	width	mm	2,650	2,710	2,800		3,100		3,300
	height	mm	2,745	2,870	2,805		3,060		3,120
clearance		mm	2,400		3,400				4,500

(1) Fule gas rated inlet temperature:500℃
(2) Minimum temperature of chilled water outlet:5℃
(3) Normal working, minimum inlet temperature of cooling water:19℃
(4) Adjustable range of chilled water flow:50%~120%
(5) Adjustable range of cooling water flow: 50%~120%
(6) The afterburning or flue gas operate seperately can meet the 100% capacity of the standard type. If you have other requestment, please contact us.
(7) The species of the LiBr absorption chiller is different according to the waste heat /exhaust gas, if you want to know the detail, you can contact us.

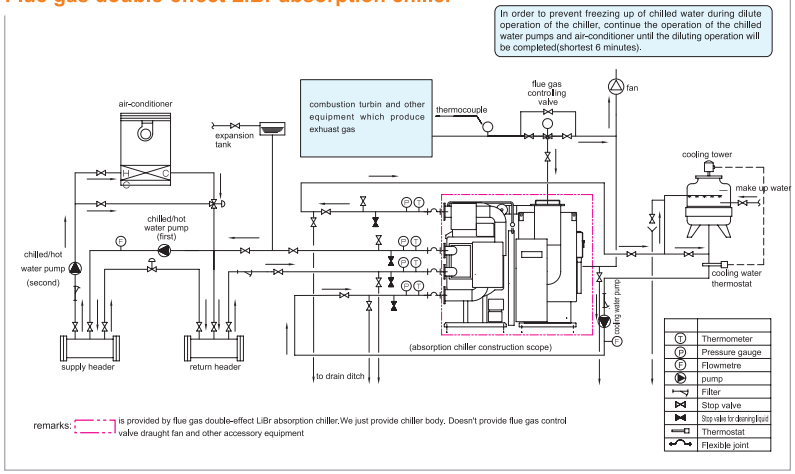
Specification

24	31	32	41	42	51	52	53
288	324	360	405	450	504	567	630
1,013	1,139	1,266	1,424	1,583	1773	1,994	2,216
87.1	98.0	108.9	122.5	136.1	152.4	171.5	190.5
202	227	252	284	315	353	397	441
86	97	108	122	135	151	170	189
847	953	1,059	1,191	1,324	1,483	1,668	1,853
568	639	710	798	887	993	1,118	1,242
12→7							
174,2	196,0	217,7	244,9	272,2	304,8	342,9	381,0
4,6	5,0	5,3	4,6	4,1	3,6	4,9	6,5
DN150			DN200				
0.8							
55.8→60							
174,2	196,0	217,7	244,9	272,2	304,8	342,9	381,0
4,6	5,0	5,3	4,6	4,1	3,6	4,9	6,5
DN150			DN200				
0.8							
32→37.7							
295	332	368	414	460	516	580	645
16,8	13,0	14,5	14,1	15,4	12,5	14,4	18,9
DN200			DN250		DN300		
0.8							
95→85							
38,6	43,4	48,2	54,2	60,2	67,5	75,9	84,3
37,3	42,0	46,7	52,5	58,3	65,3	73,5	81,6
1,6	2,4	1,8	1,6	1,8		2,3	2,7
DN100			DN125			DN150	
0.8							
3phase、380V、50Hz							
28,0	31,1		32,5	35,3	39,8		43,3
6,0	10.0						16,0
22,6	25,1		26,3	28,6	32,2		35,1
3.4(9.1)					3.7(13.4)		
1.3(4.0)			1.8(5.4)				
2.2(6.4)	2.2(9.5)						
0.4(1.8)							
0.4(1.2)							
2.2(4.5)					3.7(7.3)		5.5(10.8)
DN400		DN450		DN500			
DN400		DN450		DN500			
4,838	5,443	6,048	6,804	7,560	8,467	9,526	10,584
130		105	140	115	145	135	170
59,9	67,5	75,0	84,3	93,7	104,9	118,1	131,2
70,7	79,6	88,4	99,5	110,4	123,8	139,1	154,6
310×310	360×310		410×310		350×500		
17.6	20.8	21.7	24.3	25.8	31.6	34.8	37.9
16.6	19.6	20.4	22.7	24.1	19.1	20.8	22.0
16,6	19,6	20,4	22,7	24,1	29,0	32,0	35,0
one section					moving separately		
4,845	4,970		4,975		5,100	5,740	6,230
3,300	3,490	3,750	3,790	3,980	4,590	4,810	
3,120	3,455		3,675		3,915		
4,500					4,600	5,200	5,700

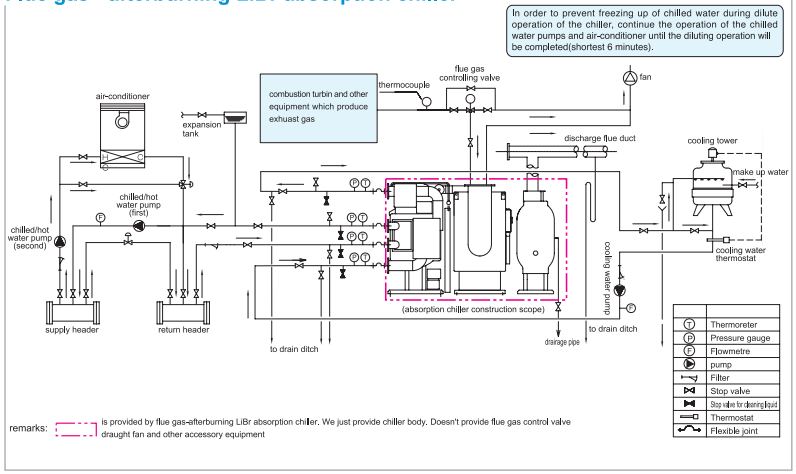
(8) If you need outline dimension drawing, please contact us.
(9) The capacity of air blast will be different according to different burner.
(10) The calorific in the table is natural gas, the value is low calorific value: 11000 kcal/Nm^3
The actual consumption of fuel=the calorific value in the table × consumption in the table/low calorific value of fuel
(11) "A"stands for nominal diameter,unit mm.
(12) Standard: JISB 8622
(13) The data will be modified without notice for technique improvement.

System flow chart example

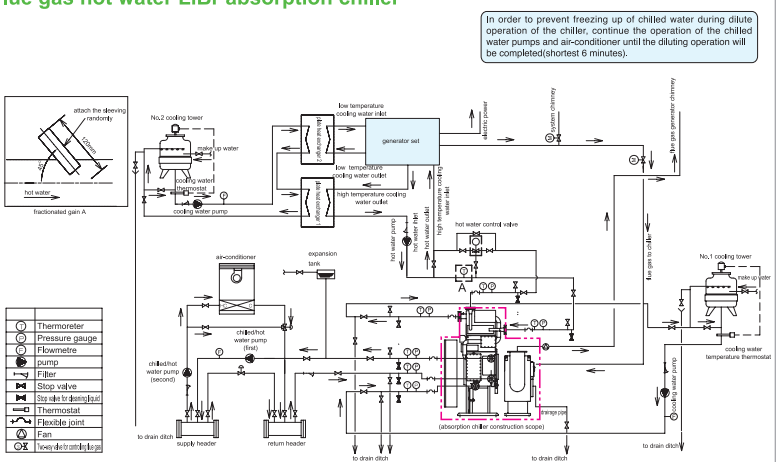
Flue gas double-effect LiBr absorption chiller



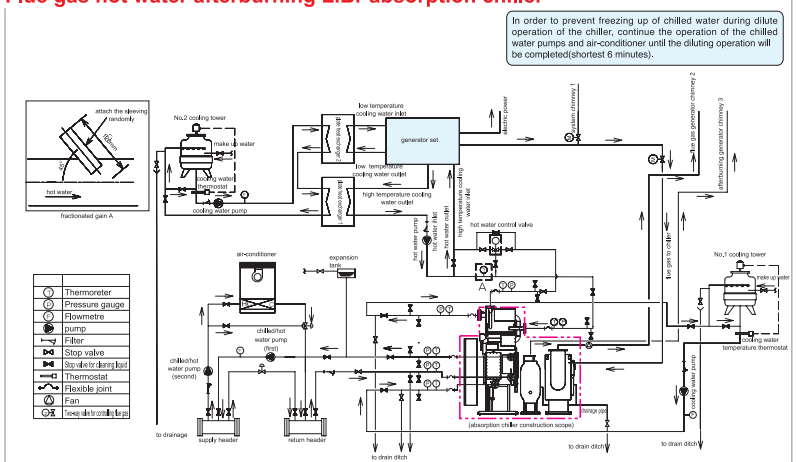
Flue gas - afterburning LiBr absorption chiller



Flue gas hot water LiBr absorption chiller



Flue gas hot water afterburning LiBr absorption chiller



Water quality supervise essential · Note for flue gas system

Cooling water and hot water quality supervise essential

- If the cooling water quality deteriorate corrosion and scale will rise,therefore the unit will be troubled with capacity declination and heat-trarsfer pipe corrosion.So make sure the water quality accord with standard.
- Water quality standard for water used in common air-conditioner and refrigerant has been formulated by Japanese Industry association of Refrigerator and air-conditioner. For detail reference following table.

Cooling water and hot water quality standard

	Item	Cooling water system			Hot water system		tendency	
		circulating		One time				
		circulating	Make-up water	One-pass water	circulating	Make-up water	corrosion	dirt
standard	PH(25℃)	6.5~8.2	6.0~8.0	6.0~8.0	7.0~8.0	7.0~8.0	○	○
	Electrical conductivity(25℃)(mS/m)	80 or less	30 or less	40 or less	30 or less	30 or less	○	○
	Electrical conductivity(25℃)(μS/cm)	800or less	300or less	400or less	300or less	300or less	○	○
	Cl^-(mgCl^-/ℓ)	200or less	50 or less	50 or less	30 or less	30 or less	○	
	$SO^2{}_4{}^-$(mg$SO^2{}_4{}^-$/ℓ)	200or less	50 or less	50 or less	30 or less	30 or less	○	
	Acid consumption (PH4.8)(mg$CaCO_3$/ℓ)(Malkalinity)	100or less	50 or less	50 or less	50 or less	50 or less		○
	Total hardness (mg$CaCO_3$/ℓ)	200or less	70 or less	70 or less	70 or less	70 or less		○
	SiO_2(mgSiO_2/ℓ)	50or less	30 or less	30 or less	30 or less	30 or less		○
reference	Fe(mgFe/ℓ)	1.0or less	0.3or less	1.0or less	1.0or less	0.3or less	○	○
	S^{2-}(mgS^{2-}/ℓ)	Not detected	Not detected	Not detected	Not detected	Not detected	○	
	$NH^+{}_4$(mg$NH^+{}_4$/ℓ)	1.0 or less	0.1or less	1.0or less	0.1or less	0.1or less	○	

Note for flue gas system

- It must be installed flue gas electrically operated flapper valve at the joint which between smoke pipe and flue gas chiller.
- It must be installed expansion joint at inlet of flue gas pipe.In avoide to expansion when it heated and force the chiller.
- It must be installed bracket support at inlet/outlet of smoke pipe which connect with flue gas chiller.In avoide to force the chiller.
- From smoke outlet of flue gas duct to flue gas inlet of chiller must be insulation work.Straight flue gas duct must be insulation work.

Note for order

Note for order

confirmation							
item	detail						
Reference information	use	☐ comfort air conditioner		☐ Industrial air conditioner		☐ other	
	Load character of air conditioner	☐ 30~60%		☐ 60~100%		☐ Always 100%	
Necessary data	Refrigeration capacity	kW					
	Chilled water temperature inlet/outlet	℃		→			
	Flow of chilled water	m^3/h					
	Heating capacity	kW					
	Hot water temperature inlet/outlet	℃		→			
	Flow of hot water	m^3/h					
	Cooling water temperature inlet/outlet	℃		→			
	Cooling water source(quality)	cooling tower ☐			recycled water of concentration ☐		
	Limited of cooling water flow	m^3/h			confirmed by chiller ☐		
	Fuel data: kinds	☐ Nature gas		☐ LPG		☐ City gas	
	Fuel data: Lower heat value(kcal/Nm^3)						
	Fuel data: Specific gravity						
	Fuel data: componet	H_2	%	CH_4	%	C_3H_6	%
		C_3H_8	%	C_4H_{10}	%	N_2	%
		Others					
	Off-gas data: Off-gas temperature	℃	Flow of off-gas	Nm³/h or		kg/h	
	Off-gas data: Off-gas component	N_2	%	O_2	%	H_2O	%
		CO_2	%	SO_2	%	Others	%
	Cylinder sleeve water and waste hot water temperature inlet,outlet	℃ → ℃		flow		m^3/h	
	Average temperature of machine room	℃		Relative humidity of machine room		%	
	others						
Address of party A or designing institute							
Other illustration							

Remarks

1. Fill fuel data or off-gas is ok. if just have fuel component,we need oxygen content contain in off-gas or coefficient of excess air produced by combustion turbine or other equipment.
2. For we can offer proper plan,please do your best to fill the table.