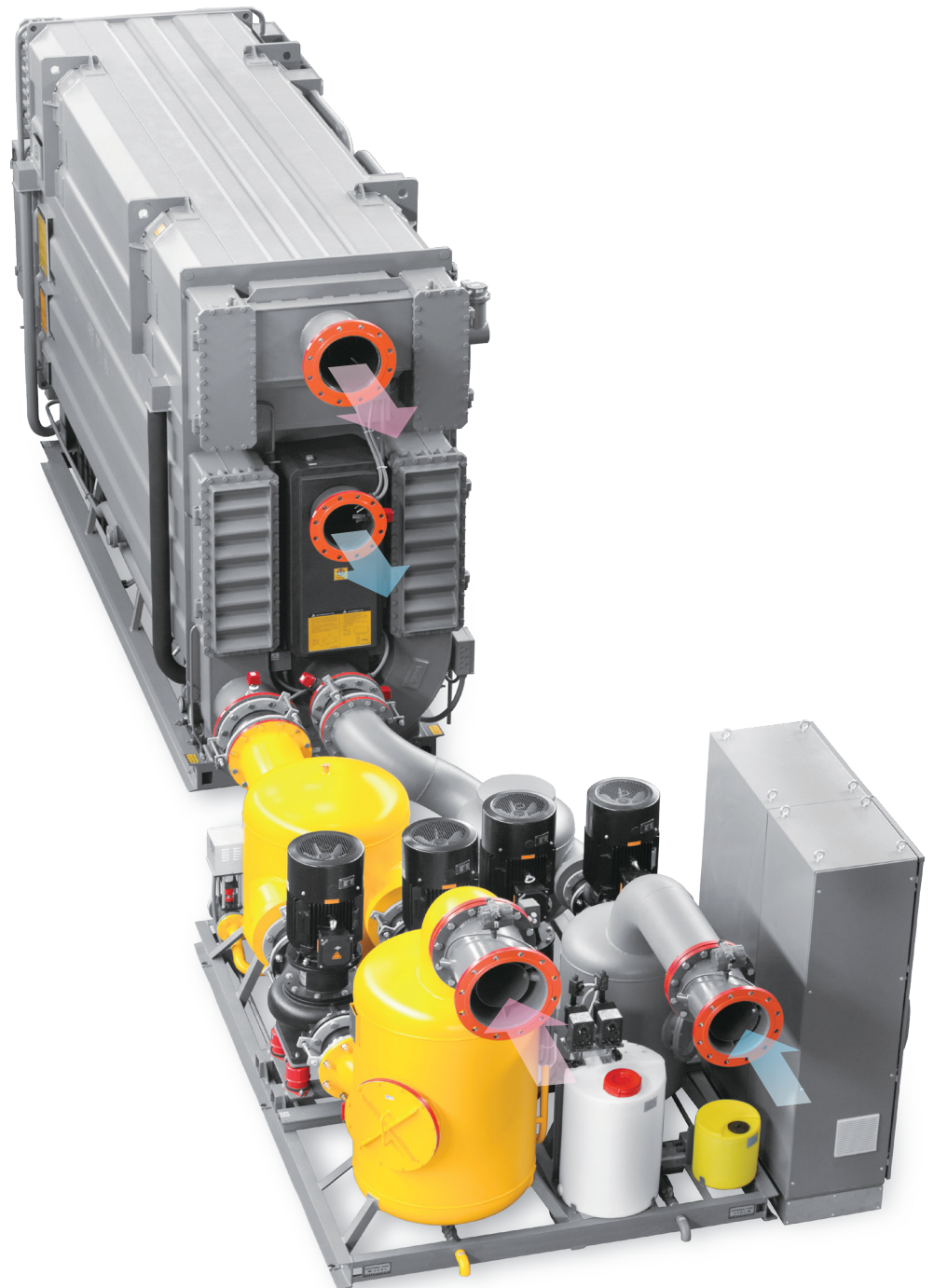




Product for Heating & Process Heating

## BROAD ABSORPTION HEAT PUMP



### Function

Low temp. waste heat recovery

### Application

- District heating
- Process heating
- Make up water preheating
- Building heating

### Heating capacity

282 kW ~ 56,489 kW

### Energy sources

- Steam
- High temp. hot water
- High temp. exhaust
- Natural gas, town gas, biogas, diesel

## BRIEF INTRODUCTION TO BROAD ABSORPTION HEAT PUMP

It is universally accepted that water flows from high position to low position, as well heat transfers from high temperature to low temperature. After the invention of water pump, water can be pumped to higher position with energy input. The same principle has been applied to heat pump. With power (electricity or thermal energy) input, heat can be moved from low temperature to high temperature. BROAD Absorption Heat Pump is a device driven by thermal energy (steam, hot water, exhaust or NG) which moves heat from low temperature to high temperature

Absorption heat pump and chiller are like twins, because they have the same structure and working principle, but application is different. A chiller is used to make chilled water, and reject heat through cooling water. An absorption heat pump recycles heat from low temperature heat source, to produce high temperature water. For typical application, conditions such as low temperature heat source and heating demand are different, so absorption heat pump has a wide range of working conditions

Compared with an electric heat pump, absorption heat pump has below advantages

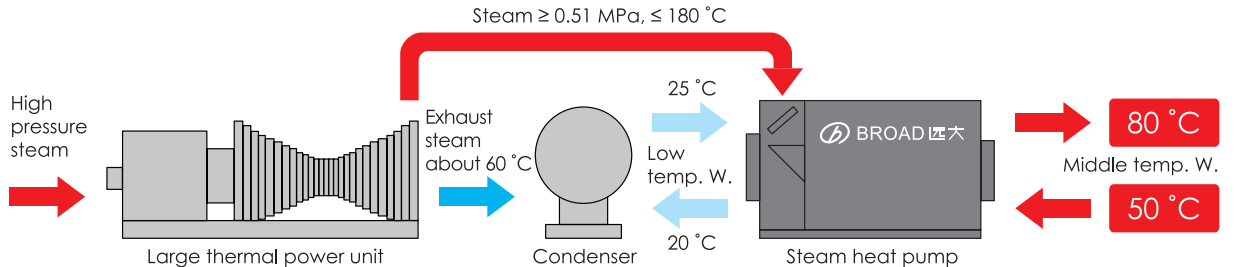
- Uses industrial waste heats, exhaust etc. as its input power
- Uses water as refrigerant instead of CFCs, HCFCs, HFCs
- Stable heating performance, endurable to ambient interruptions, no auxiliary heating equipments
- Higher heating temperature, temperature difference, and wider applications

Absorption heat pump heating capacity comes from driven energy and low temperature waste heat with a heating efficiency 2~3 times higher than a boiler. The low temperature waste heat is common in industrial processes (like industrial cooling water, boiler exhaust gas etc.) and in nature world (like surface water, ground water etc.). BROAD Absorption Heat Pump is driven by waste heat with remarkable energy savings and payback. It has been installed in many countries around the world such as China, South Korea, Denmark, Belarus, Thailand and Austria

## Typical Applications

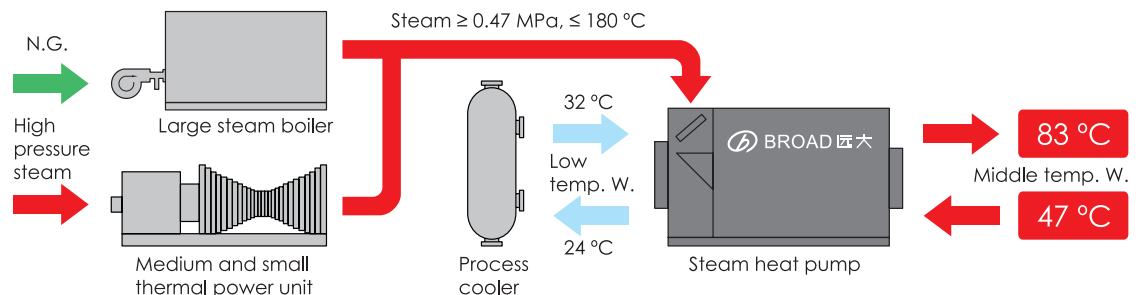
### Thermal Power Plant Heat Pump — System Energy Saving by 15~20%

- Low temp. waste heat: cooling water from power plant (15 ~ 30 °C)
- Driving heat source: steam from large scale steam turbine
- Typical application: a paper factory in Thailand, recovers 3.3 MW waste heat from cooling water to produce 85 °C middle temp. water to preheat make up water  
Two power plants in South Korea, recovers 48 MW waste heat from cooling water to produce 80 °C middle temp. water for district heating



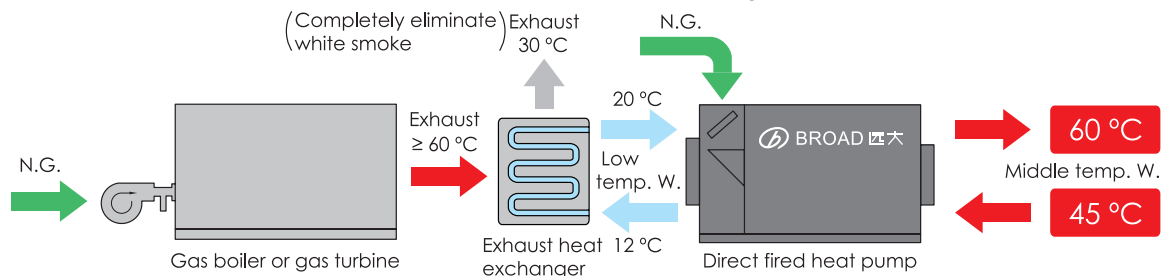
### Industrial Process Heat Pump — Heating Energy Saving by 41%

- Low temp. waste heat: waste water heat from dyeing mill (about 30 °C), cooling water from air conditioning (about 37 °C), cooling water from steel works (about 40 °C), heat from brewery process (about 50 °C), heat from oil field (about 50 °C), cooling water from coke plant (about 40 °C or 23 °C)
- Driving heat source: steam from large scale steam boiler or small & middle - sized steam turbine, natural gas, high temp. hot water
- Typical application: an eco-park in South Korea, recovers 24 MW heat from dyeing process to produce 83 °C middle temp. water for district heating  
The world's biggest daily chemicals manufacturer, which recovers 1.2 MW heat from air conditioning cooling water to produce 88 °C middle temp. water for process heating  
A district heating company in Austria, recovers 2.3 MW heat from steel works cooling water to produce 85 °C middle temp. water for district heating  
A famous Chinese liquor manufacturer, recovers 1.7 MW heat from brewery process to preheat boiler makeup water up to 80 °C

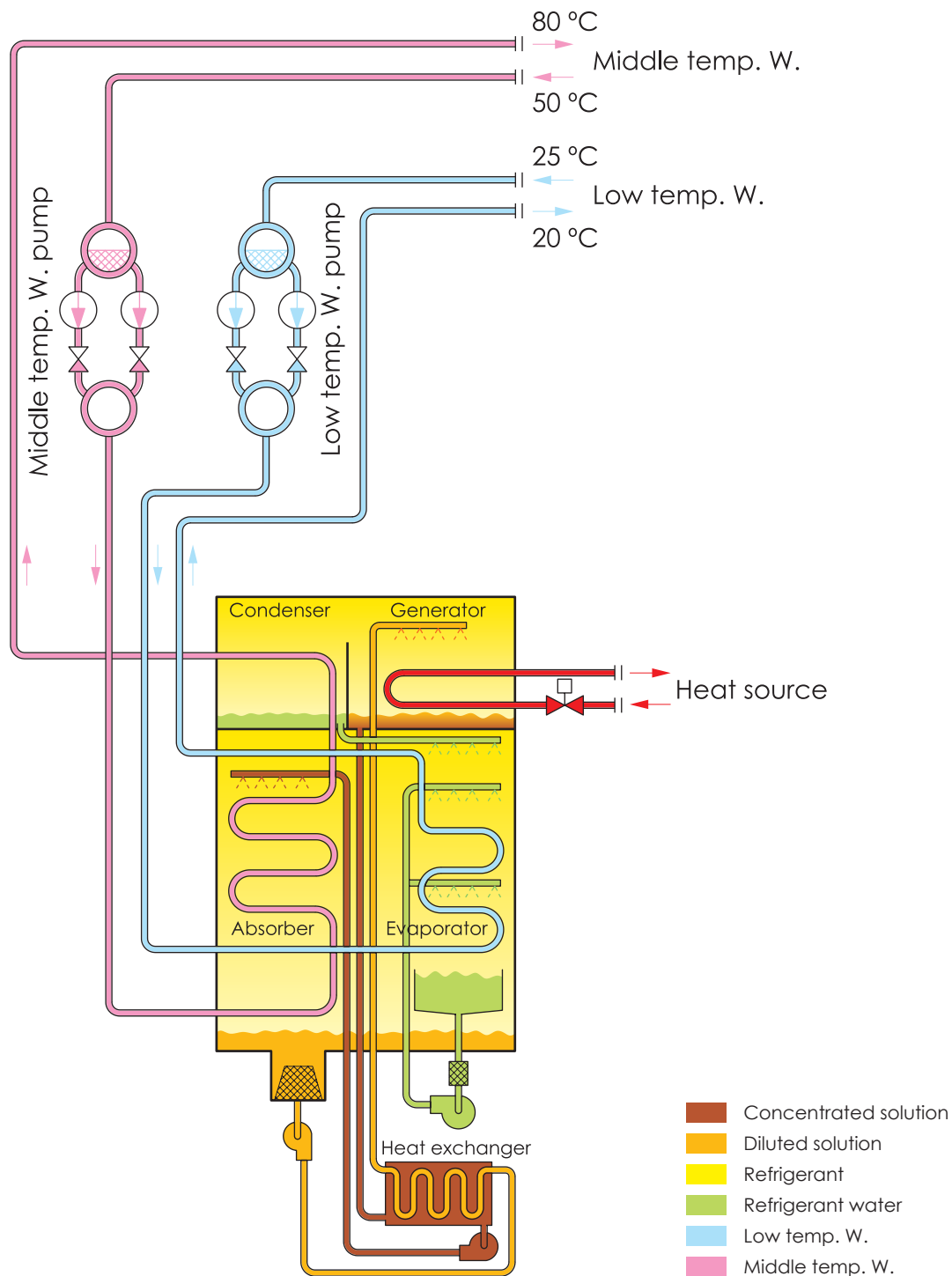


### Exhaust Heat Pump — System Energy Saving by 8~15%

- Low temp. waste heat: exhaust from boiler, gas turbine, direct fired absorption chiller etc. (60 ~ 180 °C)
- Driving heat source: natural gas, high temp. hot water, high temp. exhaust etc.
- Typical application: a biomass district heating center in Denmark, recovers 3 MW heat from biomass boiler exhaust to produce 85 °C middle temp. water for district heating  
12 th National Games Center (China) recovers 2.3 MW heat from 2\*3, 300 RT BROAD direct fired absorption chillers' exhaust to produce 60 °C middle temp. water for building heating  
A district heating center in Beijing recovers 4.7 MW heat from 3\*40 ton boilers' exhaust to produce 60 °C middle temp. water for district heating  
An energy plant in South Korea, recovers 24 MW heat from 2\*77 MW gas turbines exhaust to produce 61 °C middle temp. water for district heating



# BROAD Absorption Heat Pump

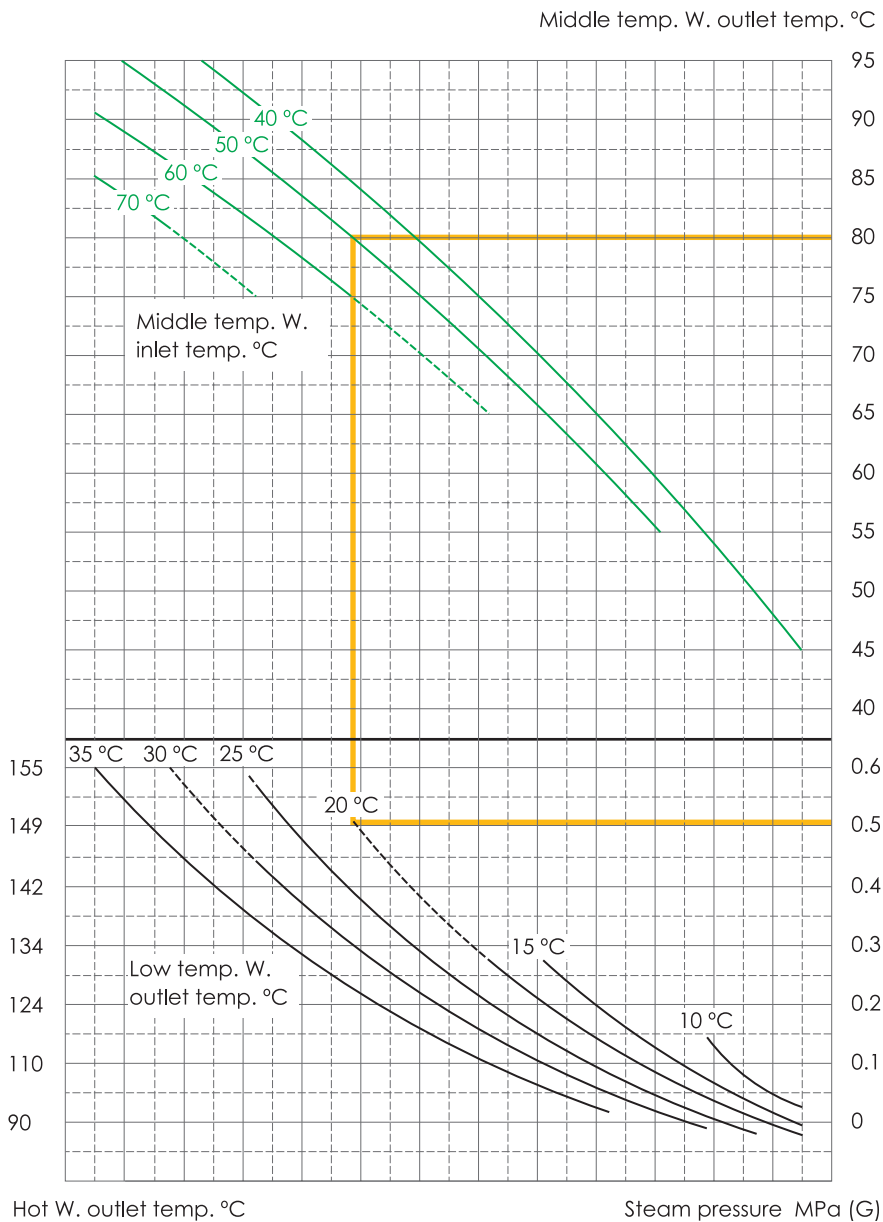


## Heating principle

Absorption heat pump is driven by heat source to recycle heat from low temperature water. The heat from driven heat source and low temperature water is provided to users in the form of middle temperature water. Refrigerant water from condenser enters evaporator. Due to high-vacuum (2 kPa absolute pressure) condition in evaporator, refrigerant evaporates immediately drop temperature to 18 °C and make low-temperature water drop from 25 °C to 20 °C. After absorbing heat from low temperature water, refrigerant water evaporates into vapor, and is absorbed by concentrated solution from generator. This process heats up middle temperature water from 50 °C to 63 °C. Diluted solution is pumped back to generator and heated by heat source to produce water vapor and concentrated solution. Refrigerant vapor enters condenser and condenses into liquid water and heats middle temperature water from 63 °C to 80 °C. After that, liquid water enters evaporator and absorbs heat from the low temperature water.

Note: Lithium Bromide is a salt of strong hygroscopicity, nontoxic and harmless, with no greenhouse effect and no damage to the ozone layer

# Absorption Heat Pump Performance Curve



## Notes:

The absorption heat pump performance curve indicates the relationship among low temperature water outlet temperature, middle temperature water outlet temperature and heat source.

If the heat source is NG, check middle temperature water outlet temperature — middle temperature water inlet temperature — low temperature water outlet temperature.

If the heat source is steam, check middle temperature water outlet temperature — steam pressure.

If low temperature water outlet temperature and middle temperature water inlet temperature are in dashed lines, then unworkable in this condition (refer to below E4).

## Examples:

1. Suppose that low temperature water outlet is 20 °C, middle temperature water is 50 °C; we can find that middle temperature water outlet is 80 °C (steam pressure 0.51 MPa).
2. Suppose that middle temperature water inlet is 45 °C, middle temperature water outlet is 60 °C; we can find that low temperature water outlet is 12 °C (steam pressure 0.2 MPa).
3. Suppose that steam pressure is 0.3 MPa, low temperature water outlet is 25 °C, middle temperature water inlet is 60 °C; we can find that middle temperature water outlet is 70.5 °C.
4. Suppose that low temperature water outlet is 20 °C, middle temperature water inlet is 60 °C; we can find that heat pump cannot work in this condition, because the curves are dashed lines.

Note: Absorption heat pump performance curve is used for preliminary model selection. The final parameters or special applications shall be proposed by BROAD

## Rated Performance Data (middle temp. water $\Delta t = 15\text{ }^{\circ}\text{C}$ )

Code	Model	Heating capacity kW	Waste heat recovery kW	Middle temp. water		Low temp. water		N.G. consumption m <sup>3</sup> /h	Steam consumption kg/h	Power demand kW	Solution Wt. t	Unit Shipment Wt. t	Split Shipment Wt. t	Operation Wt. t
				Flowrate m <sup>3</sup> /h	Pressure drop kPa	Flowrate m <sup>3</sup> /h	Pressure drop kPa							
Direct-fired type BDZ	20	282	117	16	35	12.5	25	16.4	/	2.6	1	4.4	2	4.7
	30	424	175	24	35	18.8	25	24.6	/	4.0	1.2	6.2	2.7	6.6
	50	706	291	40.7	35	31.3	25	41	/	4.6	2.3	8.8	3.6	9.4
	75	1059	436	60.7	35	46.9	25	61.8	/	7.7	2.9	10.7	4	11.7
	100	1412	582	80.7	40	62.5	29	82.4	/	9.4	3.5	12.3	5.2	14.3
	125	1765	727	101	40	78	29	103	/	10.9	4.4	15	6	17
	150	2118	872	121	40	93.7	29	124	/	11.4	5	16.7	6.8	19.7
	200	2824	1163	162	40	125	29	165	/	17.6	7.2	23	8.8	26
	250	3531	1454	203	50	156	36	207	/	18.4	8.1	27.5	10.4	31.5
	300	4273	1745	243	50	189	36	250	/	22.9	8.5	/	12	38.1
	400	5649	2326	324	50	250	36	331	/	26.9	12.2	/	16	44.7
	500	7061	2908	405	65	313	42	414	/	31	15.3	/	19.2	56.5
	600	8473	3489	486	65	375	42	496	/	43.2	19.4	/	22.4	68.2
	800	11298	4652	647	65	500	42	662	/	51.2	25.8	/	23.2	80.3
	1000	14122	5816	809	65	625	42	827	/	58.2	31.2	/	24	97.5
Steam type BDS	20	282	117	16	35	12.5	25	/	255	2.5	0.6	3.2	/	3.6
	30	424	175	24	35	18.8	25	/	385	2.5	0.7	5.4	/	6.2
	50	706	291	40.7	35	31.3	25	/	643	2.8	1.1	6.7	/	7.9
	75	1059	436	60.7	35	46.9	25	/	963	4.7	1.4	8.0	/	10.1
	100	1412	582	80.7	40	62.5	29	/	1286	4.9	1.8	9.3	/	11.5
	125	1765	727	101	40	78	29	/	1609	4.9	2.3	11.4	/	13.6
	150	2118	872	121	40	93.7	29	/	1932	5.6	2.8	13.0	/	15.3
	200	2824	1163	162	40	125	29	/	2575	7.5	4.0	18.0	/	21.2
	250	3531	1454	203	50	156	36	/	3220	9.3	5.0	21.4	/	25.6
	300	4273	1745	243	50	189	36	/	3900	10.1	5.6	26.3	/	31.4
	400	5649	2326	324	50	250	36	/	5153	13.9	6.5	29.3	/	36.4
	500	7061	2908	405	65	313	42	/	6446	15.7	10.0	/	27.5	46.7
	600	8473	3489	486	65	375	42	/	7734	19.4	11.0	/	30.5	53.5
	800	11298	4652	647	65	500	42	/	10316	25.2	13.0	/	32.0	68.3
	1000	14122	5816	809	65	625	42	/	12898	26.2	15.3	/	33.0	83

## General Conditions

- Low temp. water  $\Delta t$ :  $8\text{ }^{\circ}\text{C}$  (eg. 12/20  $^{\circ}\text{C}$ )
- Middle temp. Water  $\Delta t$ :  $15\text{ }^{\circ}\text{C}$  (eg. 60/45  $^{\circ}\text{C}$ )
- Lowest permitted outlet temp. for low temp. W.:  $5\text{ }^{\circ}\text{C}$
- Pressure limit for low temp. water and middle temp. water: 0.8 MPa (except special order)
- Fouling factor for low temp. W.:  $0.018\text{ m}^2\cdot\text{K/kW}$   
Fouling factor for middle temp. W.:  $0.044\text{ m}^2\cdot\text{K/kW}$
- Nature gas consumption is calculated upon heat value  $10\text{ kWh/Nm}^3$  ( $8600\text{ kcal/Nm}^3$ )
- Rated steam pressure refers to Performance Curves (eg. item 1 & 2 pressure is 0.2 MPa), condensate water temp.:  $95\text{ }^{\circ}\text{C}$
- Steam pressure upper limited 110%
- Adjustable load: 5 ~ 115%
- Rated exhaust outlet temp. for direct-fired heat pump:  $140\text{ }^{\circ}\text{C}$
- Standard natural gas pressure is 16 ~ 35 kPa, static pressure is < 50 kPa, lower or higher pressure can be accommodated to special orders.
- LiBr Solution concentration: 56%, solution is included in unit shipment Wt.
- Machine room ambient temperature: 5 ~  $43\text{ }^{\circ}\text{C}$ , humidity  $\leq 85\%$
- Rated heating COP: 1.7 (including heat pump power consumption)
- Life design: 60 years

## Rated Performance Data (middle temp. water $\Delta t = 30\text{ }^{\circ}\text{C}$ )

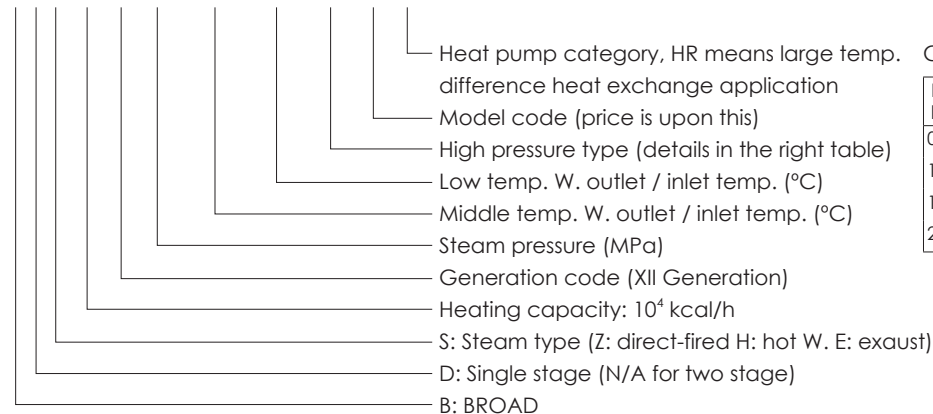
Code	Model	Heating capacity		Waste heat recovery		Middle temp. water		Low temp. water		Steam consumption	Power demand	Solution Wt.	Unit Shipment Wt.	Split Shipment Wt.	Operation Wt.
		kW	kW	kW	kW	Flowrate m <sup>3</sup> /h	Pressure drop kPa	Flowrate m <sup>3</sup> /h	Pressure drop kPa						
Steam type BDS	20	282	117			8.1	20	20	40	250	2.5	0.6	3.2	/	3.6
	30	424	175			12.1	20	30	40	379	2.5	0.7	5.4	/	6.2
	50	706	291			20.2	20	50	40	632	2.8	1.1	6.7	/	7.9
	75	1059	436			30.4	20	75	40	946	4.7	1.4	8.0	/	10.1
	100	1412	582			40.5	30	100	50	1263	4.9	1.8	9.3	/	11.5
	125	1765	727			50.6	30	125	50	1580	4.9	2.3	11.4	/	13.6
	150	2118	872			61	30	150	50	1897	5.6	2.8	13.0	/	15.3
	200	2824	1163			81	30	200	50	2527	7.5	4.0	18.0	/	21.2
	250	3531	1454			101	40	250	65	3163	9.3	5.0	21.4	/	25.6
	300	4273	1745			121	40	300	65	3852	10.1	5.6	26.3	/	31.4
	400	5649	2326			162	40	400	65	5059	13.9	6.5	29.3	/	36.4
	500	7061	2908			202	55	500	80	6325	15.7	10.0	/	27.5	46.7
	600	8473	3489			243	55	600	80	7593	19.4	11.0	/	30.5	53.5
	800	11298	4652			324	55	800	80	10121	25.2	13.0	/	32.0	68.3
	1000	14122	5816			405	55	1000	80	12657	26.2	15.3	/	33.0	83
	1200	16947	6980			486	58	1200	83	15188	38.8	22.0	/	31.5	107
	1600	22595	9304			648	58	1600	83	20240	50.4	26.0	/	33.0	140
	2000	28244	11630			810	58	2000	83	25315	52.4	30.6	/	35.0	166
	2400	33893	13956			971	60	2400	85	30374	75.6	39.0	/	33.0	218
	3200	45191	18608			1295	60	3200	85	40481	100.8	52.0	/	33.0	280
	4000	56489	23260			1619	60	4000	85	50631	104.8	61.2	/	35.0	332

## General Conditions

- Low temp. water  $\Delta t$ :  $5\text{ }^{\circ}\text{C}$  (eg. 20/25  $^{\circ}\text{C}$ )
- Middle temp. water  $\Delta t$ :  $30\text{ }^{\circ}\text{C}$  (eg. 80/50  $^{\circ}\text{C}$ )
- Pressure limit for low temp. water and middle temp. water: 0.8 MPa (except special order)
- Fouling factor for low temp. W.:  $0.018\text{ m}^2\cdot\text{K}/\text{kW}$   
Fouling factor for middle temp. W.:  $0.044\text{ m}^2\cdot\text{K}/\text{kW}$
- Rated steam pressure refers to Performance Curves (eg. item 1 & 2 pressure is 0.51 MPa), condensate water temp.:  $95\text{ }^{\circ}\text{C}$
- Steam pressure upper limited 110%
- LiBr Solution concentration: 54%, solution is included in unit shipment Wt.
- Adjustable load:  $5 \sim 115\%$
- Machine room ambient temperature:  $5 \sim 43\text{ }^{\circ}\text{C}$ , humidity  $\leq 85\%$
- Rated heating COP: 1.7 (including heat pump power consumption)
- Life design: 60 years
- Direct-fired type is available
- Big  $\Delta t$  DFA Heat Pump's low temp. w. & middle temp. w. conditions are the same with steam type Heat Pump. Others are the same with small  $\Delta t$  DFA Heat Pump

## Nomenclature

B D S 400 XII 0.51-80/50-20/25-Mb-800-R1



Codes for high pressure type

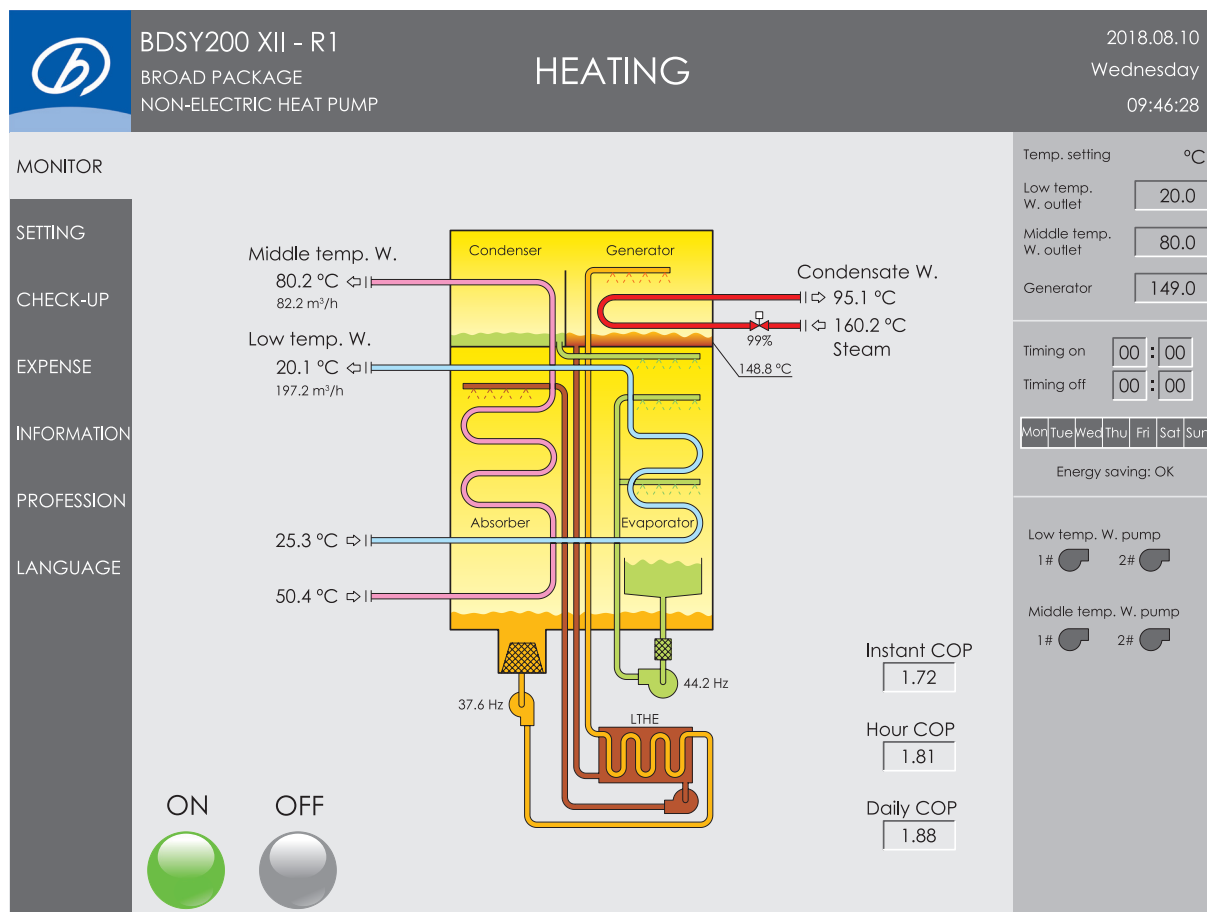
Pressure limit MPa	Low temp. W.	Middle temp. W.
0.81 ~ 1.2	Fa	Ma
1.21 ~ 1.6	Fb	Mb
1.61 ~ 2.0	Fc	Mc
2.01 ~ 2.4	Fd	Md

## Performance Data for Big Temp. Difference Heat Exchange Application

Model	BDH	20	30	50	75	100	125	150	200	250	300	400	500	600	800	1000
Heating capacity	kW	557	835	1391	2087	2783	3479	4174	5566	6957	8349	11132	13915	16697	22263	27829
Primary water																
flow rate	m <sup>3</sup> /h	7.1	10.7	17.9	26.8	35.7	44.6	53.6	71.4	89.3	107	143	179	214	286	357
Pressure drop	kPa	60	60	60	60	60	80	80	80	120	120	120	120	120	150	150
Secondary water																
flow rate	m <sup>3</sup> /h	48	72	120	180	239	299	359	479	598	718	957	1196	1436	1914	2393
Pressure drop	kPa	50	50	50	60	60	60	60	60	70	70	70	90	90	100	100
Power demand	kW	2.5	2.5	2.8	4.7	4.9	4.9	5.6	7.5	9.3	10.1	13.9	15.7	19.4	25.2	26.2
Solution wt.	†	0.6	0.7	1.1	1.4	1.8	2.3	2.8	4.0	5.0	5.6	6.5	10.0	11.0	13.0	15.3
Unit ship wt.	†	3.3	5.4	6.9	8.1	9.6	11.8	13.3	18.4	21.7	26.8	30.2	/	/	/	/
Unit ship wt.	†	/	/	/	/	/	/	/	/	/	/	/	28.5	32.0	32.0	33.0
Operation Wt.	†	3.9	6.4	8.4	10.4	12.0	14.3	15.8	22.2	26.7	33.4	38.8	50.0	57.6	72.5	89.0

## General Conditions

1. Rated primary W. outlet / inlet temp.: 28/95 °C
2. Rate secondary W. outlet / inlet temp.: 50/40 °C
3. Adjustable primary W. flowrate: 50 ~ 120%
4. Pressure limit for primary W., secondary W.:  
0.8 MPa (except special order)
5. Fouling factor for primary W., secondary W.:  
0.044 m<sup>2</sup>•K/kW
6. LiBr Solution concentration: 45%. Solution is included in unit shipment Wt.
7. Machine room ambient temperature: 5 ~ 43 °C, humidity ≤ 85%
8. Life design: 60 years



## Performance Data for Dual-working Mode (chiller & heat pump)

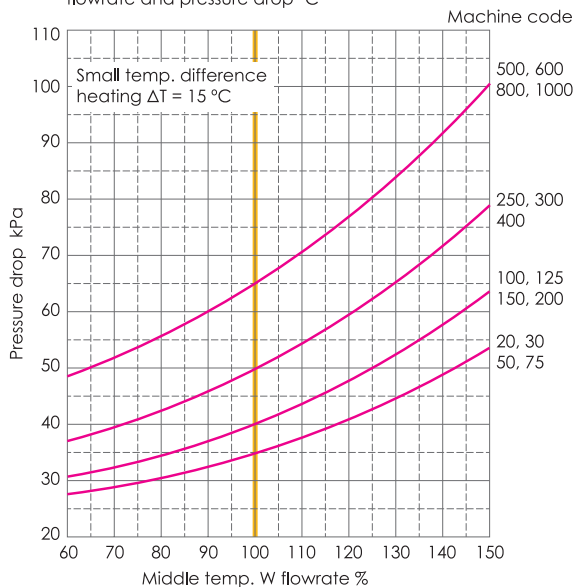
Direct-fired type		BZ	20	30	50	75	100	125	150	200	250	300	400	500	600	800	1000
Heating mode	Heating capacity	kW	282	424	706	1059	1412	1765	2118	2824	3531	4273	5649	7061	8473	11298	14122
	Low temp. water flowrate	m <sup>3</sup> /h	25	37.5	62.5	93.7	125	156	187	250	312	378	500	625	750	1000	1250
	Pressure drop	kPa	27	27	27	27	27	36	36	36	45	45	55	55	55	55	55
	Middle temp. water flowrate	m <sup>3</sup> /h	24.5	37	61.4	92.2	123	154	184	246	307	372	492	615	737	983	1229
	Pressure drop	kPa	35	35	35	35	35	35	35	35	40	40	40	40	40	40	40
	N.G.consumption	m <sup>3</sup> /h	16.4	24.6	41.1	61.8	82.4	103	124	165	207	250	331	414	496	662	827
Cooling mode	Cooling capacity	kW	233	349	582	872	1163	1454	1745	2326	2908	3489	4652	5815	6978	9304	11630
	Chilled water flowrate	m <sup>3</sup> /h	28.6	42.9	71.4	107	143	179	214	286	357	429	571	714	857	1143	1429
	Pressure drop	kPa	30	30	30	30	30	40	40	40	50	50	60	60	60	60	60
	Cooling water flowrate	m <sup>3</sup> /h	47.5	71.2	119	178	238	297	357	476	595	714	952	1190	1427	1903	2380
	Pressure drop	kPa	50	50	50	50	50	50	50	50	80	80	80	90	90	90	90
	N.G. consumption	m <sup>3</sup> /h	16.2	24.3	40.7	61.1	81.4	102	122	163	204	244	326	407	489	652	815
Power demand		kW	2.3	3.8	3.9	5.1	6.8	8.8	9.9	16.3	16.6	22.4	26.6	29.3	39.3	49.7	53.3
Solution Wt.		t	1.0	1.6	2.3	2.8	3.8	4.3	5.6	6.8	8.5	10.3	12.6	16.0	21.0	25.0	32.0
Unit Shipment Wt.		t	5.2	7.9	9.5	12.6	15.6	17.7	21	27.5	32	/	/	/	/	/	/
Main shell ship Wt.		t	2.5	4.2	5	5.6	6.5	7.6	8.9	12.7	14.8	17.8	19.8	25	27.5	30.0	32.0
Operation Wt.		t	5.8	8.5	10.3	14.1	17.9	20.2	24.2	31.1	36.3	44.3	53.3	64.1	78.5	95.8	116

## General Conditions

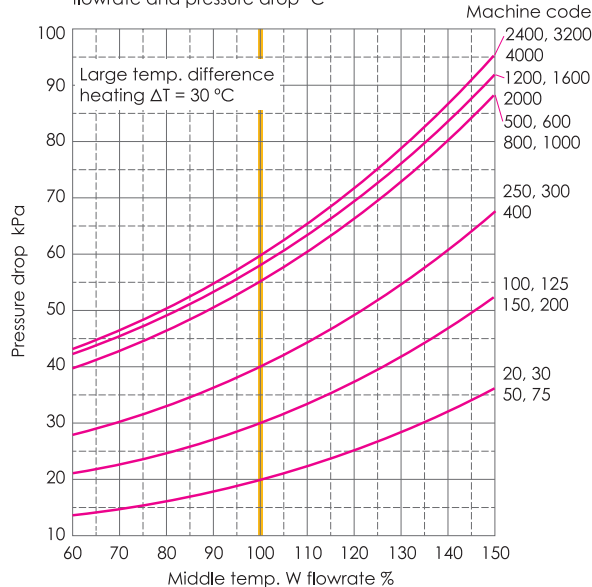
1. Rated heating mode: low temp. water 9/13 °C, Middle temp. water 50/40 °C
2. Rated cooling mode: chilled W. 7/14 °C, cooling W. 37/30 °C
3. Lowest permitted outlet temp. for low temp. W. / chilled W.: 5 °C
4. Pressure limit for low temp. W. / chilled W., middle temp. W. / cooling W.: 0.8 MPa (except special order)
5. Fouling factor for low temp. W. / chilled W.: 0.018 m<sup>2</sup>•K/kW  
Fouling factor for middle temp. W. / cooling W.: 0.044 m<sup>2</sup>•K/kW
6. Adjustable load: 5 ~ 115%
7. N.G. consumption is calculated upon heat value 10 kWh/Nm<sup>3</sup> (8600 kcal/Nm<sup>3</sup>)
8. Rated heating exhaust outlet temp.: 140 °C  
Rated cooling exhaust outlet temp.: 160 °C
9. Standard natural gas pressure is 16 ~ 35 kPa, static pressure is < 50 kPa, lower or higher pressure can be accommodated to special orders
10. LiBr Solution concentration: 54%, solution is included in unit shipment Wt.
11. Machine room ambient temperature: 5 ~ 43 °C, humidity ≤ 85%
12. Rated heating COP 1.7, Rated cooling COP 1.42
13. Life design: 60 years

# Performance Curves

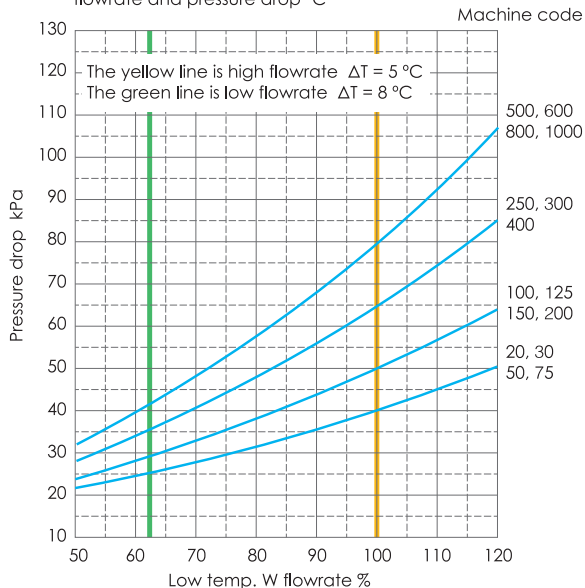
The relationship between middle temp. W. flowrate and pressure drop °C



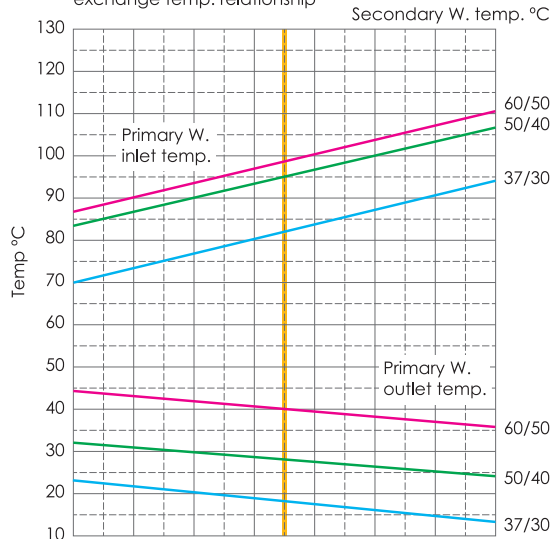
The relationship between middle temp. W. flowrate and pressure drop °C



The relationship between low temp. W. flowrate and pressure drop °C



Big temp. difference heat pump exchange temp. relationship



(BDS300-R1 Absorption Heat Pump)

# Model Selection & Ordering

## Application

Recycle low temperature waste heat to produce hot water under 95 °C for district heating, process heating, makeup water preheating, building heating

## Application selection

- Only when there is heating demand and a large quantity of low temp. waste heat, then select heat pump upon supply & return water temperature difference is possible
- If heating system capacity is insufficient, by increasing a heat supply & return water temperature difference to improve heating capacity, then select large temperature difference heat pump
- When there is cooling demand in summer and heating demand in winter and a large number of low temp. waste heat, then select dual-mode application

## Heat source selection

- Please specify parameters including heat source type, flow rate, temperature, pressure etc.
- Superheated steam temperature  $\leq 180\text{ }^{\circ}\text{C}$ , otherwise special order shall be placed
- Fuel applicable to direct-fired heat pump: natural gas, town gas, LPG, biogas, light oil or recycled oil. Natural gas and recycled gas oil are the priorities. Different burner matches different fuel
- High temperature hot water or high temperature exhaust also can be energy alternative

## Low temp. water selection

- Please specify low temperature water parameters including flow rate, temperature, pressure etc.
- Industrial cooling water is the first priority as low temperature water. River water, sea water, geothermal water, groundwater etc also can be alternative
- Low temp. water  $\geq 5\text{ }^{\circ}\text{C}$
- Low temperature exhaust steam is also applicable in special case
- BROAD heat pump with corrosion-resistance materials can be selected upon the water quality report if the water is corrosive

## Parameter selection

All parameters of absorption heat pump should be in accordance with Absorption Heat Pump Performance Curve

## Pressure selection

- Standard pressure limit for middle / low temperature water circle is 0.8 MPa. Information about high pressure type please see Codes for high pressure type
- 0.81 ~ 1.2 MPa system: high pressure type heat pump is suggested. 1.21 ~ 1.6 MPa system: either super high pressure type heat pump or secondary heat exchanger system can be selected > 1.6 MPa system: secondary heat exchange is recommended

## Water distribution system selection

It is recommended to select BROAD Package Water Distribution System based on flow rate and head. It with features like low operation power consumption, small footprints, quick installation, worry free etc. (see details in "BROAD XII NON-ELECTRIC CHILLER MODEL SECTION & DESIGN MANUAL")

## Control

- BROAD absorption heat pump is equipped with complete control device, including internet monitoring
- If customer have a building management system (BMS), the BMS control interface can be selected as an optional supply. If the BMS interface is not ordered along with the heat pump, it can be purchased later

## Lead time

- $\leq 150$  type: 4 months
- 200 ~ 1000 type: 5 months
- $\geq 1000$  type: 6 months  
(8 months required for order with 3+ units)

## Warranty

Free warranty is to cover 24 months from commissioning or 30 months from shipment, whichever comes earlier. BROAD provides paid service in the whole life span. Service price list is available upon request

## Inquiry

The specifications in the catalog are rated parameters. For any inquiries with non-rated parameters, please contact BROAD

## Absorption Heat Pump Supply List

	Item	Remarks
Heat pump	Heat pump	Include generator, condenser, evaporator, absorber, heat insulation
	Heat exchanger	Plate type with heat insulation
	Generation pump, refrigerant pump, absorption pump, vent pump	Welded canned type
	Auto purge & vent system	Includes falling head auto purge device, auto air vent device
	Heat source valve	Control heat input and filter included (N/A. for direct fired type)
	Steam trap	Only for steam type
	Burner	Only for direct fired type
Control system	Control cabinet	Include low voltage components, control board, PLC, etc.
	Touch screen (Separate packing and shipping)	For operation
	Inverter	Solution pump inverter and refrigerant pump inverter
	External control elements	Include temperature sensor, flow switch, pressure controller, solution level probe and actuator
	Network gateway (one for each customer)	For internet monitoring
Others	LiBr solution	Include corrosion inhibitor and energy intensifier



BROAD Absorption Heat Pump is ISO, CE, ETL, ASME certificated



100g

**To protect forest & water  
sources, please imitate us  
to adopt compact layout  
& thin paper printing**



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