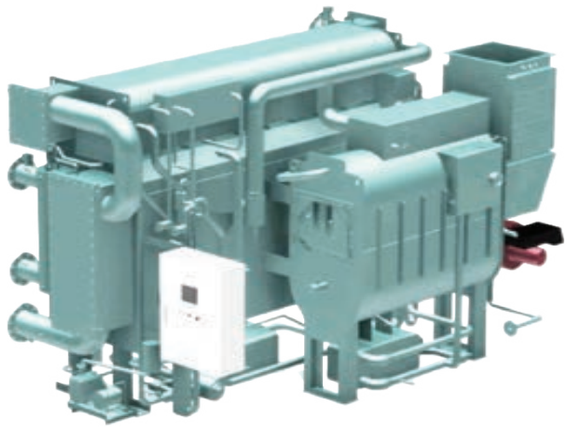
Patent ISO9001 ISO14001 ISO45001 CE K-mark High Efficiency KARSE

World EnC Absorption Chiller



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ENERKON® THE HEART OF THE BOILER

World EnC

Creating Value For The Customer
Through The Absorption Technology

World EnC Co.,Ltd.

THE BEST SOLUTION FOR
ABSORPTION CHILLER

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ENERKON THE HEART OF THE BOILER

World EnC

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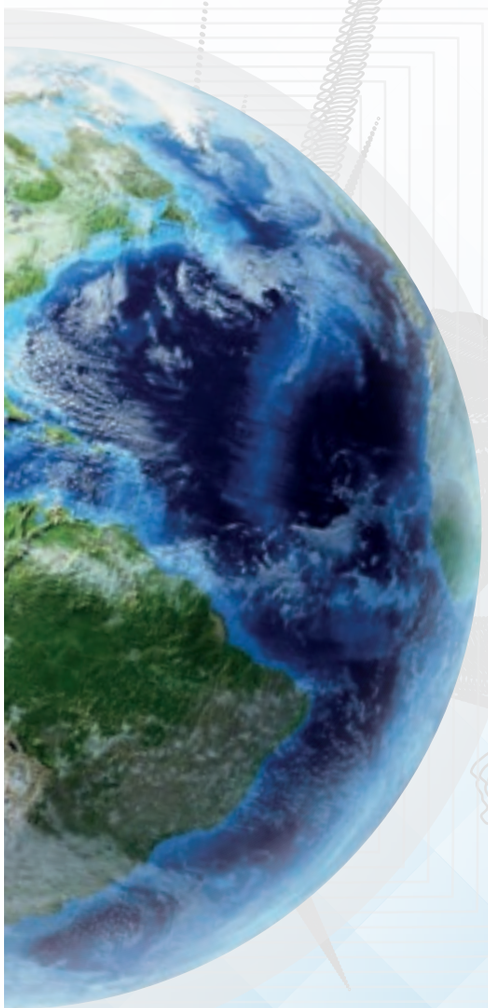

By Continuing challenge
We will open the eco-friendly future

By continuing challenge,
We will open the eco-friendly future.

World EnC Absorption Chiller

We challenge, innovate and strive to satisfy our customers with the best value by providing the most pleasant environment and happiness for the mankind based on our accumulated technology.
The compay being advanced backed up by customer's encouragement and trust.

The company always seeking innovation with the sense of responsibility and future-oriented mind.
We commit ourselves to taking our full responsibility as a new leader of the future energy industry based on the best quality and the latest technology.

CE Certificate

ISO 14001
Environmental Management

High Efficiency
Energy Equipment

Business Registration Certificate

Factory Resistration Certificate

Construction Registration Certificate

RnD Center Certificate

INNO-BIZ Certificate

ISO 9001 Certificate

ISO 45001 Certificate

ISO 14001 Certificate

CE Certificate

CE Certificate

CE Certificate

CE Certificate

KARSE Certificate

Q-Mark

K-Mark

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High Efficiency

High Efficiency

Brief History

2023	Development Oil-Free Centrifugal Chiller : Danfoss/Turbocor Compressor 2-3 comp (200~600RT)
2022	Development Oil-Free Centrifugal Chiller : Danfoss/Turbocor Compressor 1 comp (80~200RT)
2021	Acquired 3 patents for vapor compression chiller (Flooded evaporator, high efficiency condenser, oil recovery function)
2020	Begin to development of vacuum hot water boiler
2019	Acquired high efficiency Certi. of Screw Chiller (Water coolded-134a)
2018	Initiate development of High Efficiency Screw Chiller
2017	Initiate national project of development of Heat Pump and transformer
	Initiate national project of development of Absorption Chiller
2016	Certificate of Designation of Excellent Product by Public Procurement
	Service Registraion of Direct Fired Absorption Chiller&Heater in Korea Public Procurement Agency
	Certificate of green technology (Double Lift Hot water Driven Absorption Chiller)
	Certificate of high efficiency energy material (Double Lift Hot water Driven Absorption Chiller)
	New business for Screw chiller and Absorption heat pump
2015	Start to develop absorption heat pump for nation project
	Development of Air Handling Unit (AHU) for exhaust heat recovery
2014	Registration Air Handling Unit in Public Procurement Agency
	CE : Double-Effect Direct Fired Absorption Chiller&Heater Single-Effect Double Lift Hot water Driven Absorption Chiller (WDL 75~975 Series)
2013	Certificate ISO 14001
	Build a new factory for Air Handling Unit(AHU)
2011	Development of High-efficiency Direct Fired Absorption chiller&heater (COP 1.36, 1.51(LHV))
2010	Resigtration of Double Lift Hot water Driven Absorption Chiller as excellent product by Korea Public Procure Agency
2009	Development of exhaust gas absorption chiller-heater
2007	Registration of patent (Double Lift Hot water Driven Absorption Chiller)
2006	Development of Double Lift Hot water Absorption Chiller
	Development of Single Effect Hot water Driven Absorption Chiller
	Certificate INNO BIZ by SMBA
2005	Registration license of making specific facility, Certificate of venture company
	Establish research affiliated with World E&C (Korea industrial technology promotion association)
2001-2003	Certificate ISO 9001 / 9002
1999	Business for high temperature generator in Direct Fired Absorption Chiller&Heater
	Establish World EnC


Outside of Factory


Office Building and R&D Center

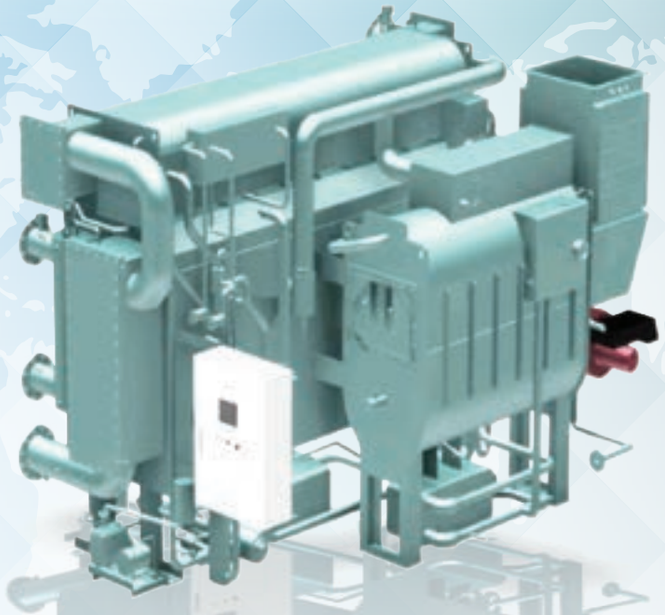

Inside of Factory


Performance Test Equipment

Direct Fired Absorption Chiller & Heater

50RT ~ 1500RT 29 Models

CE



Patent

Features of WDA Series

1. High reliability

- Designed to enhance the reliability and durability
- Robust structure through the perfect reliability test for long time and higher reliability by adopting high quality components

2. Efficient operation

- Energy saving and efficiency realized
- Optimal control for the solution cycling volume by inverter depending on the cooling load
- Optimal PID control by sensing the operating condition with the level sensor
- Minimized power consumption due to precise operation and partial load operation
  [Option] Early reduction, Anti-freezing, Refrigerant generation, Solution refining, Tube ball clean, Crystal forming prevention from power failure

3. Convenient partition

- Repair and maintenance is easy. Multi-partition structure
- Mounting/detaching structure for easy repair and maintenance
- Partial incoming to make it possible for field work such as remodeling at narrow space. Assembling at field is possible.

4. Low noise and low vibration

- Below 75dB at 1m distance for noise level

5. Perfect vacuum

- High performance & purge system.
  Cost-efficiency for maintenance
- Leakage for one month at below 3cc.
  High vacuum condition
- Auto purge. / Non-condensing gas storage
- Maintaining optimal operating condition.
  Operation with only minimum steam extraction.

6. Enough capacity

- Heating capacity increase system
- Designed to increase up to 3 stages from the standard.

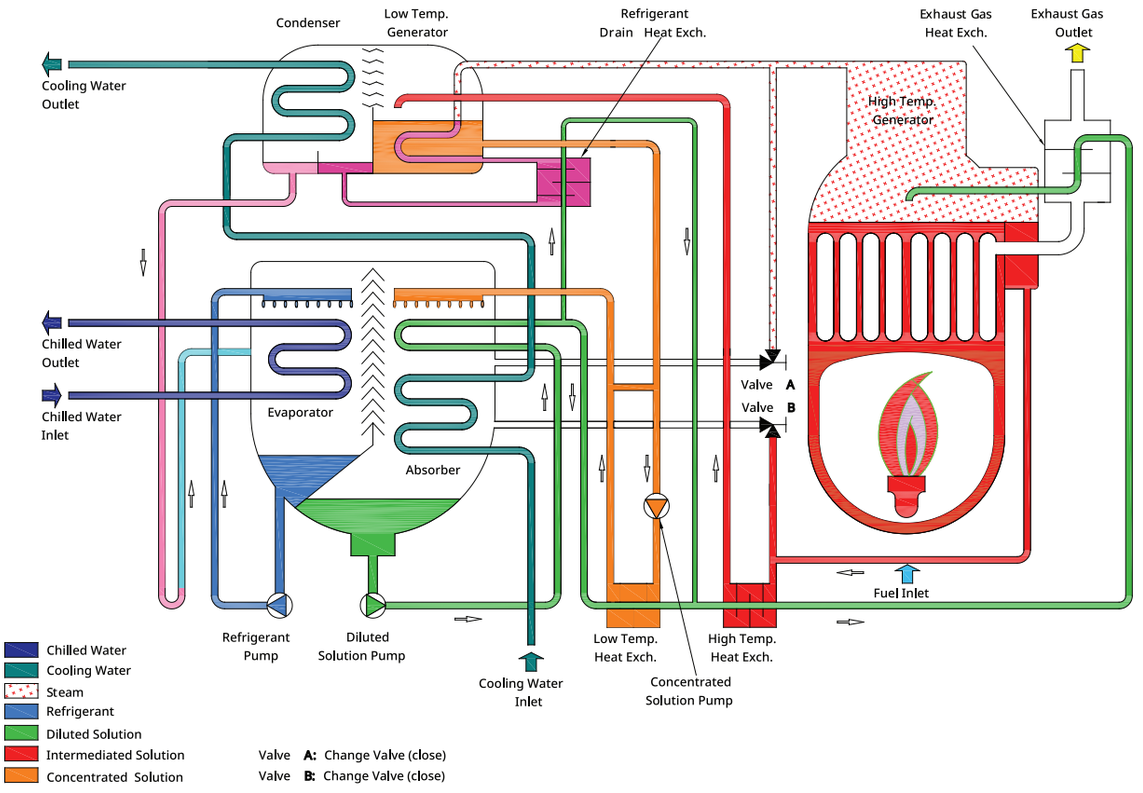
7. Latest operation

- Latest PLC, remote control and BAS compatible
- Increase chiller's efficiency with precise PID control
- Applicable for Modbus, Ethernet, BAC Net TCP/IP
- 10 inch touch screen and possible for VNC communication
- Chiller's status can be monitored through PLC Web connection (Option)

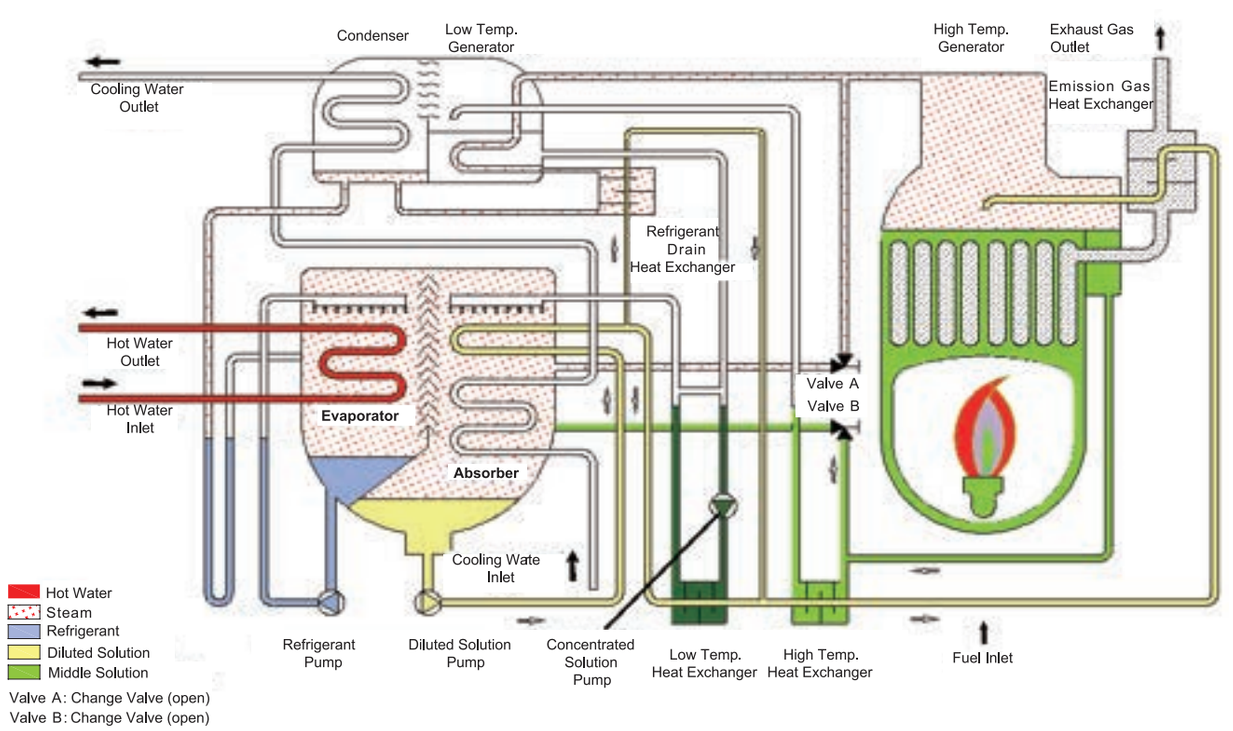
CYCLE DIAGRAM

Direct Fired Absorption Chiller & Heater

Cooling Cycle Diagram



Heating Cycle Diagram



SPECIFICATION [WDA Series]

Direct Fired Absorption Chiller & Heater

COP 1.1(LHV)

MODEL			UNIT	WDA 005	WDA 006	WDA 007	WDA 008	WDA 010	WDA 012	WDA 015	WDA 018	WDA 021	WDA 024	WDA 028	WDA 032	WDA 036	WDA 040
Cooling capacity			usRT	50	60	70	80	100	120	150	180	210	240	280	320	360	400
			kW	176	211	246	281	352	422	528	633	739	844	985	1,125	1,266	1,407
Heating Capacity			Mcal/h	151	181	212	242	302	363	454	544	635	726	847	968	1,089	1,210
			kW	176	211	246	281	352	422	528	633	739	844	985	1,125	1,266	1,407
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12/7 (Heating 55 / 60℃)													
	Flow rate		㎥/h	30.2	36.3	42.3	48.4	60.5	72.6	90.7	108.9	127.0	145.2	169.3	193.5	217.7	241.9
	P.Drop		mAq	7.6	7.7	5.8	5.4	5.9	6.0	8.0	8.1	7.5	7.4	5.3	5.2	5.7	5.9
	Connection		㎜	80				100				125			150		
Cooling Water	Temp. (inlet/outlet)		℃	32/37													
	Flow rate		㎥/h	50	60	70	80	100	120	150	180	210	240	280	320	360	400
	P.Drop		mAq	3.5	3.7	8.2	7.7	3.3	3.5	9.6	10.1	5.8	4.7	8.7	8.8	8.9	8.8
	Connection		㎜	100				125				150			200		
Fuel	Gas	Cooling	N㎥/h	15.9	19.1	22.3	25.5	31.8	38.2	47.7	57.3	66.8	76.4	89.1	101.9	114.6	127.3
		Heating	N㎥/h	18.9	22.7	26.5	30.2	37.8	45.4	56.7	68.0	79.4	90.7	105.9	121.0	136.1	151.2
		Connection	㎜	40 (4,000mmAq)													
	Oil	Cooling	kg/h	16.4	19.7	23.0	26.3	32.9	39.4	49.3	59.2	69.0	78.9	92.0	105.2	118.3	131.5
		Heating	kg/h	19.5	23.4	27.3	31.2	39.0	46.8	58.6	70.3	82.0	93.7	109.3	124.9	140.5	156.1
		Connection	㎜	10				15			20						
Electric	Power Source		–	3Φ, 400V, 50Hz													
	Abs. Pump No.1		kW(A)	1.2(4.0)				2.0(6.0)				2.4(7.5)		3.0(11.0)		3.4(10.2)	
	Abs. Pump No.2		kW(A)	0.3(1.6)				0.4(1.6)				1.2(4.5)				1.5(5.0)	
	Ref. Pump		kW(A)	0.2(1.1)				0.3(1.5)				0.4(1.5)					
	Purge Pump		kW(A)	0.4(1.4)													
	Burner Blower		kW(A)	0.37(1.0)		0.75(2.1)					1.5(4.0)			2.2(5.0)			3.0(6.5)
	Oil Pump		kW(A)	–				0.24(0.6)			0.55(2.1)						
	Control Panel		kW(A)	0.2(0.5)													
	Total Amp.	Gas	kW(A)	2.67 (9.6)		3.05 (10.7)		4.05 (13.1)			4.8(15.0)	6.1 (19.4)		7.4 (23.9)		8.1(23.6)	8.9(25.1)
		Oil	kW(A)	2.67 (9.6)		3.05 (10.7)		4.29 (13.7)			5.35(17.1)	19.95 (21.5)		7.95 (26.0)		8.65(25.7)	9.45(27.2)
Size	Length(L)		㎜	2,630		2,700		2,853		3,644		3,696		4,782		4,867	
	Width(W)		㎜	1,840		1,840		1,940		2,051		2,102		2,200		2,287	
	Height(H)		㎜	1,910				2,020				2,390				2,585	
Weight	Rigging		Ton	2.7	2.9	3.1	3.5	3.8	4.0	4.9	5.3	6.1	7.2	7.7	8.3	10.3	10.5
	Operation		Ton	3.0	3.2	3.4	3.8	4.6	4.8	5.8	6.4	7.5	7.8	8.7	9.3	11.7	12.1
Space for Tube Replacement			㎜	2,000		2,400				3,400					4,600		

Remark

1) 1usRT = 3,024 kcal/h
2) Working Pressure of each water side is based on 1.0MPa [151psig]
3) Nutural Gas LHV(Lower Heating Value) : 9,500kcal/Nm^3 , Diesel Oil LHV(Lower Heating Value) : 9,200kcal/kg
4) Fouling factor 0.0001m^2·h·℃/kcal for Absorber and Condenser, 0.0001m^2 ·h·℃/kcal for Evaporator.
5) Catalogue specifications are subject to change without prior notice.

MODEL			UNIT	WDA 045	WDA 050	WDA 056	WDA 063	WDA 070	WDA 080	WDA 090	WDA 100	WDA 110	WDA 120	WDA 130	WDA 140	WDA 150
Cooling capacity			usRT	450	500	560	630	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
			kW	1,583	1,758	1,969	2,216	2,462	2,814	3,165	3,517	3,869	4,220	4,572	4,924	5,275
Heating Capacity			Mcal/h	1,361	1,512	1,693	1,905	2,117	2,032	2,286	2,540	2,794	3,048	3,302	3,556	3,810
			kW	1,583	1,758	1,969	2,216	2,462	2,363	2,659	2,954	3,250	3,545	3,840	4,136	4,431
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12/7 (Heating 55 / 60℃)												
	Flow rate		㎥/h	272.2	302.4	338.7	381.0	423.4	483.8	544.3	604.8	665.3	725.8	786.2	846.7	907.2
	P.Drop		mAq	5.1	5.3	4.2	5.7	7.6	5.5	7.4	9.7	7.4	9.4	11.7	9.4	11.5
	Connection		㎜	200					250			300			350	
Cooling Water	Temp. (inlet/outlet)		℃	32/37												
	Flow rate		㎥/h	450	500	560	630	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500
	P.Drop		mAq	8.6	8.7	6.4	8.8	11.7	9.1	12.3	16.2	12.3	15.7	7.2	12.8	15.7
	Connection		㎜	250		300			350			400				
Fuel	Gas	Cooling	N㎥/h	143.2	159.2	178.3	200.5	222.8	254.7	286.5	318.3	350.1	382.0	413.8	445.6	477.5
		Heating	N㎥/h	170.1	189.0	211.7	238.2	264.6	254.0	285.8	317.6	349.3	381.1	412.8	444.6	476.3
		Connection	㎜	50 (4,000mmAq)								65 (4,000mmAq)				
	Oil	Cooling	kg/h	147.9	164.3	184.1	207.1	230.1	263.0	295.8	328.7	361.6	394.4	427.3	460.2	493.0
		Heating	kg/h	175.7	195.2	218.6	245.9	273.3	262.3	295.1	327.9	360.7	393.5	426.3	459.1	491.9
		Connection	㎜	20					25							
Electric	Power Source			3Φ, 400V, 50Hz												
	Abs. Pump No.1		kW(A)	3.4(10.2)		5.5(14.5)			6.6 (16.2)			7.5 (25.0)				
	Abs. Pump No.2		kW(A)	1.5 (5.0)		2.0 (6.0)			2.2 (7.0)			4.5 (16.0)				
	Ref. Pump		kW(A)	0.4(1.5)					1.5(4.0)							
	Purge Pump		kW(A)	0.4(1.4)												
	Burner Blower		kW(A)	3.0(6.5)		5.5(13.0)			7.5(15.8)			11.0(22.7)				
	Oil Pump		kW(A)	0.55(2.1)					1.1(4.0)							
	Control Panel		kW(A)	0.2(0.5)												
	Total Amp.	Gas	kW(A)	8.9 (25.1)		14 (36.9)			18.4 (44.9)			25.1 (69.6)				
		Oil	kW(A)	9.45 (27.2)		14.55 (39.0)			19.5 (48.9)			26.2 (73.6)				
Size	Length(L)		㎜	4,880	4,960	5,100	5,600	6,150	5,750	6,250	6,800	6,200	6,700	7,200	6,900	7,400
	Width(W)		㎜	2,550		3,150			3,400			4,210			4,630	
	Height(H)		㎜	2,800		3,300			3,600			3,600			3,800	
Weight	Rigging		Ton	12.6	12.8	18.1	19.6	21.0	27.9	30.2	32.6	37.8	40.7	43.2	47.5	50.0
	Operation		Ton	14.5	14.8	20.7	22.3	24.0	31.8	34.3	37.0	42.1	45.2	48.1	52.7	55.6
Space for Tube Replacement			㎜	4,600			5,200	5,700	5,200	5,700	6,200	5,700	6,200	6,700	6,200	6,700

SPECIFICATION [WDA-E Series]

Direct Fired Absorption Chiller & Heater

COP 1.36(LHV) Middle-efficiency model

Model			Unit	WDAE 005	WDAE 006	WDAE 007	WDAE 008	WDAE 010	WDAE 012	WDAE 015	WDAE 018	WDAE 021	WDAE 024	WDAE 028
Cooling capacity			usRT	50	60	70	80	100	120	150	180	210	240	280
			kW	176	211	246	281	352	422	527	633	738	844	984
Heating Capacity			Mcal/h	133	159	186	212	265	318	398	477	557	636	742
			kW	155	185	216	247	308	370	463	555	648	740	863
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12 / 7 (Heating 55.6 / 60 ℃)										
	Flow rate		ton/h	30.2	36.3	42.3	48.4	60.5	72.6	90.7	108.9	127.0	145.2	169.3
	P. Drop		mAq	7.6	7.7	5.8	5.4	5.9	6.0	8.0	8.1	7.5	7.4	5.3
	Connection		mm	80				100				125		150
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37										
	Flow rate		㎥/h	50	60	70	80	100	120	150	180	210	240	280
	P. Drop		mAq	3.5	3.7	8.2	7.7	3.3	3.5	9.6	10.1	5.8	4.7	8.7
	Connection		mm	100				125				150		200
Fuel	Gas	Cooling	Nm^3/h	12.1	14.5	17.0	19.4	24.2	29.1	36.3	43.6	50.9	58.2	67.8
		Heating	Nm^3/h	15.2	18.2	21.2	24.2	30.3	36.3	45.5	54.5	63.6	72.6	84.7
		Connection	mm	40 (4,000mmAq)										
Fuel	Oil	Cooling	kg/h	16.4	19.7	23.0	26.3	32.9	39.4	49.3	59.2	69.0	78.9	92.0
		Heating	kg/h	19.5	23.4	27.3	31.2	39.0	46.8	58.6	70.3	82.0	93.7	109.3
		Connection	mm	10				15			20			
Electric	Power Source			3ϕ 400V 50Hz										
	Abs. Pump No.1		kW(A)	1.2(4.0)				2.0 (6.0)				2.4(7.0)		3.2(8.5)
	Abs. Pump No.2		kW(A)	0.3(1.4)				0.4(1.5)				1.2(4.0)		
	Ref. Pump		kW(A)	0.2(1.2)				0.3(1.3)				0.4(1.4)		
	Purge Pump		kW(A)	0.4 (1.3)										
	Burner Blower		kW(A)	0.37 (1.0)		0.75 (2.1)					1.5 (4.0)			2.2 (5.0)
	Control Panel		kW(A)	0.2 (0.5)										
	Total Amp.		A	9.4		10.5		12.7			14.6	18.2		20.7
Size	Length(L)		mm	2,620		2,820		2,660	2,860	3,660		3,700		4,770
	Width(W)		mm	1,800				1,950		2,075		2,110		2,200
	Height(H)		mm	1,880				2,040		2,029		2,390		2,390
Weight	Rigging		Ton	2.8	3.0	3.3	3.7	4.0	4.2	5.1	5.6	6.4	7.6	8.1
	Operation		Ton	3.2	3.4	3.6	4.0	4.8	5.0	6.1	6.7	7.9	8.2	9.1
Space for Tube Replacement			mm	2,000		2,400				3,400				4,500

Remark

1) 1usRT = 3,024 kcal/h
2) Working Pressure of each water side is based on 1.0MPa [151psig]
3) Nutural Gas LHV(Lower Heating Value) : 9,500kcal/Nm^3
4) Fouling factor 0.0001m^2·h·℃/kcal for Absorber and Condenser, 0.0001m2·h·℃/kcal for Evaporator.
5) Catalogue specifications are subject to change without prior notice.

Model			Unit	WDAE 032	WDAE 036	WDAE 040	WDAE 045	WDAE 050	WDAE 056	WDAE 063	WDAE 070	WDAE 080	WDAE 090	WDAE 100
Cooling capacity			usRT	320	360	400	450	500	560	630	700	800	900	1000
			kW	1,125	1,266	1,406	1,582	1,758	1,969	2,215	2,461	2,813	3,165	3,516
Heating Capacity			Mcal/h	849	955	1,061	1,193	1,326	1,485	1,671	1,856	2,121	2,386	2,651
			kW	987	1,110	1,234	1,387	1,542	1,727	1,943	2,158	2,466	2,774	3,082
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12 / 7 (Heating 55.6 / 60 ℃)										
	Flow rate		ton/h	193.5	217.7	241.9	272.2	302.4	338.7	381.0	423.4	483.8	544.3	604.8
	P. Drop		mAq	5.2	5.7	5.9	5.1	5.3	4.2	5.7	7.6	5.5	7.4	9.7
	Connection		mm	150			200					250		
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37										
	Flow rate		㎥/h	320	360	400	450	500	560	630	700	800	900	1000
	P. Drop		mAq	8.8	8.9	8.8	8.6	8.7	6.4	8.8	11.7	9.1	12.3	16.2
	Connection		mm	200			250		300			350		
Fuel	Gas	Cooling	Nm^3/h	77.5	87.2	96.9	109.0	121.2	135.7	152.7	169.6	232.6	261.7	290.8
		Heating	Nm^3/h	97.0	109.1	121.2	136.2	151.4	169.6	190.8	211.9	232.1	261.1	290.1
		Connection	mm	50 (4,000mmAq)										
Fuel	Oil	Cooling	kg/h	105.2	118.3	131.5	147.9	164.3	184.1	207.1	230.1	263.0	295.8	328.7
		Heating	kg/h	124.9	140.5	156.1	175.7	195.2	218.6	245.9	273.3	262.3	295.1	327.9
		Connection	mm	20								25		
Electric	Power Source			3φ 400V 50Hz										
	Abs. Pump No.1		kW(A)	3.2(8.5)	3.4(9.5)				5.5(14.3)			6.6(17)		
	Abs. Pump No.2		kW(A)	1.2 (4.0)	1.5 (4.8)				2.0 (6.0)			2.2(6.5)		
	Ref. Pump		kW(A)	0.4(1.4)								1.5(4.0)		
	Purge Pump		kW(A)	0.4 (1.3)										
	Burner Blower		kW(A)	2.2 (5.0)		3.0 (6.5)			5.5 (13.0)			7.5 (15.8)		
	Control Panel		kW(A)	0.2 (0.5)										
	Total Amp.		A	20.7	22.5	24.0			36.5			45.1		
Size	Length(L)		mm	4,770	4,880		4,970		5,100	5,600	6,110	5,750	6,250	6,800
	Width(W)		mm	2,200	2,370		2,640		3,250		3,330	3,400		
	Height(H)		mm	2,454	2,600		2,800		3,400			3,600		
Weight	Rigging		Ton	8.7	10.8	11.0	13.2	13.4	18.1	19.6	21.0	27.9	30.2	32.6
	Operation		Ton	9.8	12.3	12.7	15.2	15.5	20.7	22.3	24.0	31.8	34.3	37.0
Space for Tube Replacement			mm	4,500						5,200	5,700	5,200	5,700	6,200

SPECIFICATION [WDA-H Series]

Direct Fired Absorption Chiller & Heater

COP 1.51(LHV) High-efficiency model

MODEL			Units	WDAH 004	WDAH 005	WDAH 006	WDAH 007	WDAH 008	WDAH 010	WDAH 012	WDAH 015	WDAH 018	WDAH 021	WDAH 024
Cooling capacity			usRT	40	50	60	70	80	100	120	150	180	210	240
			kW	141	176	211	246	281	352	422	527	633	738	844
Heating Capacity			Mcal/h	106	133	159	186	212	265	318	398	477	557	636
			kW	123	155	185	216	247	308	370	463	555	648	740
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12 / 7 (Heating 55.6 / 60)										
	Flow rate		㎥/h	24.2	30.2	36.3	42.3	48.4	60.5	72.6	90.7	108.9	127.0	145.2
	P.Drop		mAq	4.8	5.5	4.1	4.3	4.0	4.3	5.4	5.8	5.7	5.8	4.0
	Connection		㎜	80				100				125		150
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37										
	Flow rate		㎥/h	40	50	60	70	80	100	120	150	180	210	240
	P.Drop		mAq	5.4	6.0	5.9	6.0	4.3	4.8	6.4	7.3	7.3	7.8	6.6
	Connection		㎜	100				125				150		200
Fuel	Gas	Cooling	Nm³/h	8.9	11.2	13.4	15.7	17.9	22.4	26.8	33.6	40.3	47.0	53.7
		Heating	Nm³/h	11.6	14.5	17.4	20.4	23.3	29.1	34.9	43.6	52.3	61.1	69.8
		Connection	㎜	40 (4,000mmAq)										
Electric	Power Source		–	3φ 400V 50Hz										
	Abs. Pump No.1		kW(A)	1.2 (4.0)				2.0 (6.0)				2.4 (7.5)		3.0 (11.0)
	Abs. Pump No.2		kW(A)	0.3 (1.6)				0.4 (1.6)				1.2 (4.5)		
	Ref.Pump		kW(A)	0.2 (1.1)				0.3 (1.5)				0.4 (1.5)		
	Purge Pump		kW(A)	0.4 (1.4)										
	Burner Blower		kW(A)	0.37 (1.0)		0.72 (2.1)					1.5 (4.0)			2.2 (5.0)
	Control Panel		kW(A)	0.2 (0.5)										
	Total Amp.		kW(A)	2.67 (9.6)		3.055 (10.7)		4.05 (13.1)			4.8 (15.0)	6.1 (19.4)		7.4 (23.9)
Size	Length(L)		㎜	2,630		2,700		2,800		3,660		3,700		4,770
	Width(W)		㎜	1,840		1,840		1,970			2,075	2,100		2,200
	Height(H)		㎜	1,978				2,150				2,500		2,510
Weight	Rigging		Ton	2.8	3.0	3.3	3.7	4.0	4.2	5.1	5.6	6.4	7.6	8.1
	Operation		Ton	3.2	3.4	3.6	4.0	4.8	5.0	6.1	6.7	7.9	8.2	9.1
Space for Tube Replacement			㎜	2,000		2,400				3,400				4,500

Remark

1) 1usRT = 3,024 kcal/h
2) Working Pressure of each water side is based on 1.0MPa [151psig]
3) Nutural Gas LHV(Lower Heating Value) : 9,500kcal/Nm^3, Diesel Oil LHV(Lower Heating Value) : 9,200kcal/kg
4) Fouling factor 0.0001m^2·h·℃/kcal for Absorber and Condenser, 0.0001m^2·h·℃/kcal for Evaporator.
5) Catalogue specifications are subject to change without prior notice.

MODEL			Units	WDAH 028	WDAH 032	WDAH 036	WDAH 040	WDAH 045	WDAH 050	WDAH 056	WDAH 063	WDAH 070	WDAH 080	WDAH 090
Cooling capacity			usRT	280	320	360	400	450	500	560	630	700	800	900
			kW	984	1,125	1,266	1,406	1,582	1,758	1,969	2,215	2,461	2,813	3,165
Heating Capacity			Mcal/h	742	849	955	1,061	1,193	1,326	1,485	1,671	1,856	2,121	2,386
			kW	863	987	1,110	1,234	1,387	1,542	1,727	1,943	2,158	2,466	2,774
Chilled & Hot Water	Temp. (inlet/outlet)		℃	12 / 7 (Heating 55.6 / 60℃)										
	Flow rate		㎥/h	169.3	193.5	217.7	241.9	272.2	302.4	338.7	381.0	483.8	544.3	604.8
	P.Drop		mAq	4.1	4.6	4.9	3.8	4.2	3.4	4.6	6.3	4.3	6.0	8.1
	Connection		㎜	150			200					250		
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37										
	Flow rate		㎥/h	280	320	360	400	450	500	560	630	700	800	900
	P.Drop		mAq	6.9	7.3	7.3	6.8	7.0	5.2	7.2	9.7	7.2	10.0	13.4
	Connection		㎜	200			250		300			350		
Fuel	Gas	Cooling	Nm³/h	62.6	71.6	80.5	89.5	100.7	111.8	125.3	140.9	156.6	178.9	201.3
		Heating	Nm³/h	81.4	93.0	104.7	116.3	130.8	145.4	162.8	183.2	232.6	261.7	290.8
		Connection	㎜	40 (4,000mmAq)						50 (4,000mmAq)				
Electric	Power Source			3ϕ 400V 50Hz										
	Abs. Pump No.1		kW(A)	3.0 (11.0)	3.4 (10.2)				5.5 (14.5)			6.6 (16.2)		
	Abs. Pump No.2		kW(A)	1.2(4.5)	1.5 (5.0)				2.0 (6.0)			2.2 (7.0)		
	Ref.Pump		kW(A)	0.4 (1.5)								1.5 (4.0)		
	Purge Pump		kW(A)	0.4 (1.4)										
	Burner Blower		kW(A)	2.2 (5.0)		3.0 (6.5)			5.5 (13.0)			7.5 (15.8)		
	Control Panel		kW(A)	0.2 (0.5)										
	Total Amp.		kW(A)	7.4(23.9)	8.1(23.6)	8.9(25.1)			14(36.9)			18.4(44.9)		
Size	Length(L)		㎜	4,770	4,870		4,900		5,100	5,600	6,150	5,750	6,250	6,800
	Width(W)		㎜	2,200	2,300	2,430	2,650		3,150			3,400		
	Height(H)		㎜	2,510	2,640		2,900		3,394			3,720		
Weight	Rigging		Ton	8.7	10.8	11.0	13.2	13.4	18.1	19.6	21.0	27.9	30.2	32.6
	Operation		Ton	9.8	12.3	12.7	15.2	15.5	20.7	22.3	24.0	31.8	34.3	37.0
Space for Tube Replacement			㎜	4,500						5,200	5,700	5,200	5,700	6,200

Double Lift
Hot Water Absorption Chiller

75RT ~ 1500RT 27 Models

Hot Water Temp. : 95°C->55°C (ΔT40°C)

WDLE / Stable, Convenient, Efficient and Reliable

Non-carbon eco-friendly chiller

- Use of regional heating hot water (Energy use efficiency 84%. The ratio of incineration heat of the combined waste heat - 74%)
- Use of natural refrigerant water instead of Freon refrigerant destroying ozone layer
- No CO2 and Nox which cause the global warming

Zero explosive danger by vacuum operation

- Internal pressure vacuum
- No danger of gas explosion by use of hot water
- Safety from the danger of high-pressure damage

The excellent partial load part-load value

- Auxiliary cycle auto stop if the cooling load is below 80%
- Energy saving by 25% per chilled ton due to the increase in the efficiency by 25%

Low noise & Low vibration

- Noise level: Below 75 dB at 1m distance

Economic air-conditioniong

- Conventional Chiller: Δ 15 ℃ (95℃ -> 80℃)
  – Insufficient heating hot water
- Sing-effect/ Double-lift Chiller: Δ 40 ℃ (95℃ -> 55℃)
  – Saving 60% of the existing hot water use capacity
  Wide range of the use

Micro processor control with only start-up signal for automatic operation

- Precise control of start-up, stop, capacity control, abnormal stop, etc.
- Easy to handle due to the touch screen
- Control of auxiliary cycle, self-diagnostic function & other controls

Saving maintenance cost

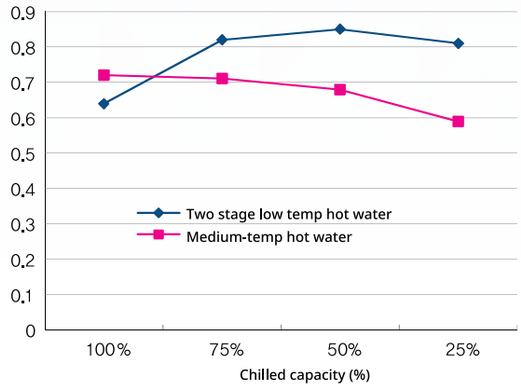
- Leakage per month: 3cc or below. High vacuum condition
- Auto steam extraction. Non-condensing gas storage
- Optimal condition of the operation
- Operating with only minimum purging

IPLV(Integrated Part-Load Value)

	Chilled water inlet ℃	Cooling capacity	COP	Part Load rate	IPLV
Single effect double lift type	31.0	100%	0.64	0.01	0.83
	29.8	75%	0.82	0.42	
	28.8	50%	0.85	0.45	
	28.0	25%	0.81	0.12	
	Chilled water inlet ℃	Cooling capacity	COP	Part Load rate	IPLV
Single effect type	31.0	100%	0.72	0.01	0.68
	29.9	75%	0.71	0.42	
	29.1	50%	0.68	0.45	
	28.1	25%	0.59	0.12	

1) Chilled water outlet temp keeps at 8℃ and hot water inlet temp keeps at 95℃
2) Assuming that the ambient humid temp is 27℃ for the chilled water inlet temp, it was designed to be lower depending on the hot water flow rate.
3) Part load rate is subject to the paragraph 5.3.2.2 of AR1560-2000.

Comparison of partial load COP



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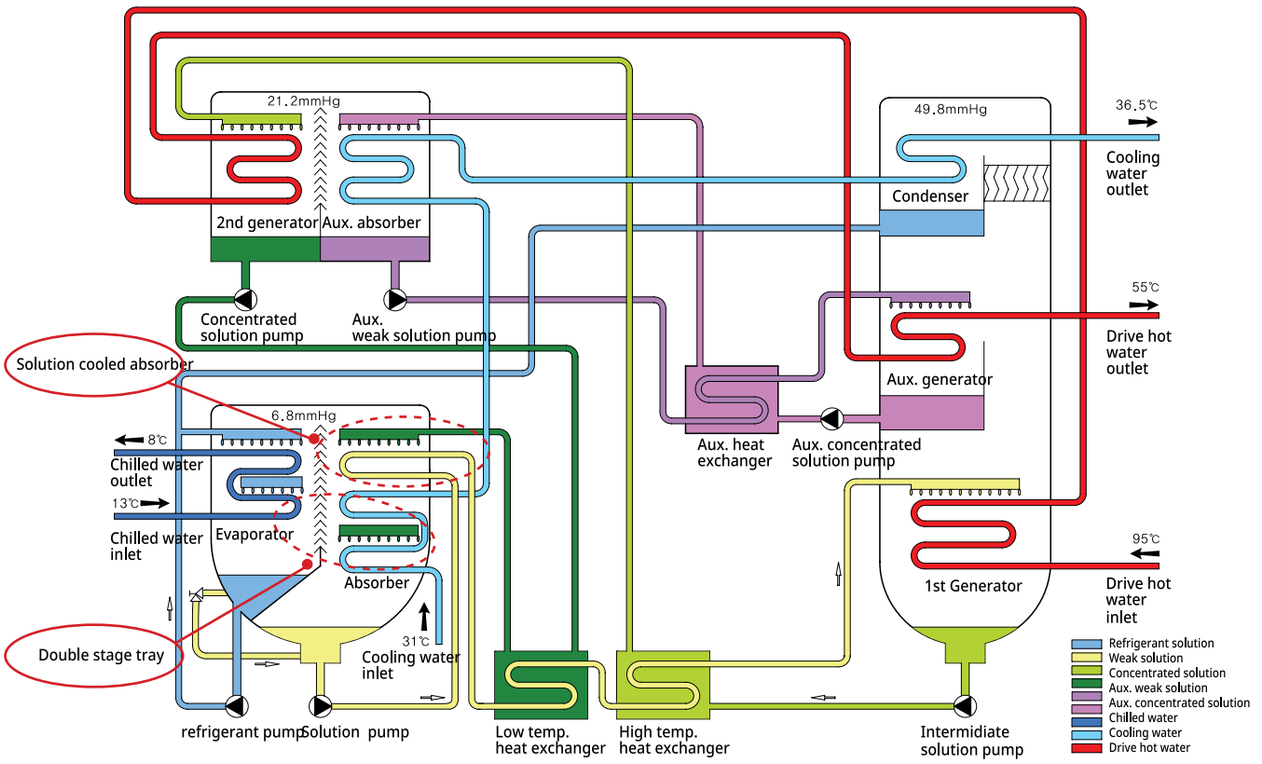
CYCLE DIAGRAM

Double Lift Hot Water Absorption Chiller



As the refrigerant is evaporated from the evaporator, the chilled water flowing inside the heating tube of the evaporator is cooled down and the refrigerant evaporated is absorbed by the concentrated absorbing liquid from the 2nd generator. The concentrated absorbing liquid will become thick absorbing liquid and the heat generate will be absorbed by the chilled water. The thick absorbing liquid which absorbed the refrigerant steam from the absorbing unit will go to the 1st generator passing through the low-temp and high-temp heat exchangers. The hot water at 95℃ in the 1st generator will heat the thick absorbing liquid to generate the refrigerant steam and then it flows to the 2nd generator after passing through the high-temp heat exchanger. The medium concentrated thick absorbing liquid comes from the 2nd generator will be heated by the hot water coming from the 1st generator and it generates the refrigerant steam.

The refrigerant steam generated from the 2nd generator will be absorbed by the absorbing liquid flowing outside the heat tube and the thick absorbing liquid which absorbed the refrigerant steam from the aux absorbing unit will flow to the aux generator after passing through aux heat exchanger, so that it is heated by the hot water flowing the heat tube of the aux generator to generate the refrigerant steam. Then, the concentrated absorbing liquid is returned back to the aux absorbing unit after passing through the aux heat exchanger.

The refrigerant steam generated from the 1st generator and the aux generator will condense the refrigerant with the leakage of the chilled water inside the heat tube and then it absorbs the heat generated.

That is, the hot water flows the 1st generator → 2nd generator → aux generator while the chilled water flows absorbing unit → aux absorbing unit → condenser in order to form a chilled cycle. In addition, the low-temp hot water two stage absorbing chiller has main cycle and aux cycle and the details of the solution (liquid) flow are as below.

Main cycle solution flow

Absorber → Diluted solution pump → Low-temp heat exchanger → High-temp heat exchanger → 1st generator → Intermidiate solution pump → High-temp heat exchanger → 2nd generator → Concentrated solution pump → Low-temp heat exchanger → Absorber

Aux cycle solution flow

Aux diluted solution pump → Aux heat exchanger → Aux generator → Aux. absorber → Aux heat exchanger → Aux concentrated solution pump → Aux diluted solution pump

SPECIFICATION [WDLE Series]

Double Lift Hot Water Absorption Chiller

Model		Unit	WDLE 75	WDLE 90	WDLE 110	WDLE 135	WDLE 155	WDLE 180	WDLE 210	WDLE 240	WDLE 270	WDLE 300	WDLE 340	WDLE 375
Cooling capacity		usRT	75	90	110	135	155	180	210	240	270	300	340	375
		kW	264	317	387	475	545	633	739	844	950	1055	1196	1319
Chilled Water	Temp. (inlet/outlet)	℃	12 / 7											
	Flow rate	m^3/h	45.4	54.4	66.5	81.6	93.7	108.9	127.0	145.2	163.3	181.4	205.6	226.8
	P. Drop	mH_2O	6.7	6.9	10.0	10.7	9.8	9.8	9.9	9.7	10.2	10.2	8.9	9.5
	Connection	A	80		100		125				150		200	
Cooling Water	Temp. (inlet/outlet)	℃	32 / 37											
	Flow rate	m^3/h	98.3	117.9	144.1	176.9	203.1	235.9	275.2	314.5	353.8	393.1	445.5	491.4
	P. Drop	mH_2O	6.7		10.6	10.9	11.6	12.1	11.9		11.1			11.2
	Connection	mm	125		150				200		250			
Driving Hot Water	Temp.	℃	95 / 55											
	Flow rate	ton/h	7.8	9.3	11.4	14.0	16.1	18.6	21.7	24.9	28.0	31.1	35.2	38.8
	P. Drop Shell	mH_2O	2.8	2.8	4.2	4.4	4.5	4.5	5.4	5.3	4.1	4.3	5.2	5.3
	P. Drop Control Valve	mH_2O	1.6	2.3	2.2	2.1	2.8	2.3	2.0	2.7	2.1	2.6	2.1	2.6
	Connection	A	65				80				100			
	Control Valve Size	A	40			50			65				80	
Electric	Power Source		3Φ 400V 50Hz											
	Abs. Pump	kW (A)	3.0 (11.9)		3.7 (13.3)		4.0 (14.1)		4.5 (15.3)		4.7 (15.3)		5.1 (17.1)	
	Ref. Pump	kW (A)	0.2 (1.2)		0. 3 (1.4)				0.4 (1.4)					
	Purge Pump	kW (A)	0.4 (1.3)											
	Control Panel	kW (A)	0.2 (0.5)											
	Total Amp.	A	14.9		16.5		17.3		18.5		18.5		20.3	
Size	Length(L)	mm	2,670		3,664		3,715		4,760		4,872		4,884	
	Width(W)	mm	1,702				1,845				2,096		2,273	
	Height(H)	mm	2,556				2,710				2,788		3,118	
Weight	Rigging	ton	4.5	4.7	5.8	6.1	7.3	7.7	9.0	9.4	11.5	12.0	13.8	14.3
	Operation	ton	5.2	5.4	6.7	7.1	8.6	9.1	10.6	11.1	13.7	14.4	16.5	17.2
Space for Tube Replacement		mm	2,400		3,400				4,600					

Model			Unit	WDLE 420	WDLE 470	WDLE 525	WDLE 600	WDLE 675	WDLE 750	WDLE 825	WDLE 900	WDLE 975	WDLE 1050	WDLE 1125	WDLE 1300
Cooling capacity			usRT	420	470	525	600	675	750	825	900	975	1050	1125	1300
			kW	1477	1653	1846	2110	2374	2638	2901	3165	3429	3693	3957	4572
Chilled Water	Temp. (inlet/outlet)		℃	12 / 7											
	Flow rate		m^3/h	254.0	284.3	317.5	362.9	408.2	453.6	499.0	544.3	589.7	635.0	680.4	786.2
	P. Drop		mH_2O	8.6	3.9	5.2	9.9	4.4	5.9	4.2	5.4	6.8	5.2	6.4	5.9
	Connection		A	200			250			300					
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37											
	Flow rate		m^3/h	550.3	615.9	687.9	786.2	884.5	982.7	1081.0	1179.3	1277.6	1375.8	1474.1	1703.4
	P. Drop		mH_2O	8.0	10.9	12.6	10.7	12.4	14.4	11.6	7.9	9.9	6.6	8.1	11.9
	Connection		mm	300			350			400			450		
Driving Hot Water	Temp.		℃	95 / 55											
	Flow rate		ton/h	43.5	48.7	54.4	62.1	69.9	77.7	85.4	93.2	101.0	108.7	116.5	134.6
	P. Drop	Shell	mH_2O	3.7	3.8	2.9	4.3	5.8	3.1	2.8	3.5	4.3	3.7	4.3	5.5
		Control Valve	mH_2O	2.0	2.6	1.4	1.9	2.3	2.9	1.6	1.9	2.3	2.6	3.0	2.2
	Connection		A	100			125						150		
	Control Valve Size		A	80		100				125					150
Electric	Power Source			3Φ 400V 50Hz											
	Abs. Pump		kW (A)	5.8 (18.8)			7.8 (22.5)	10(30.9)		10.6 (34.8)			14.8 (49.3)		
	Ref. Pump		kW (A)	0.4 (1.4)				1.5 (4.0)							
	Purge Pump		kW (A)	0.4 (1.3)											
	Control Panel		kW (A)	0.2 (0.5)											
	Total Amp.		A	22			25.7	36.7		40.6			55.1		
Size	Length(L)		mm	4,994	5,536	6,034	5,650	6,180	6,705	6,505	7,005	7,505	7,050	7,700	8,700
	Width(W)		mm	2,446			2,770			3,565			3,980		
	Height(H)		mm	3,468			3,740			4,194			4,380		
Weight	Rigging		ton	19.4	21.1	22.6	27.2	29.3	31.3	37.1	39.2	41.6	45.2	48.4	56.0
	Operation		ton	23.5	25.5	27.4	32.2	34.7	37.0	44.0	46.4	49.3	53.7	57.5	66.5
Space for Tube Replacement			mm	4,600	5,200	5,700	5,200	5,700	6,200	5,700	6,200	6,700	6,300	6,800	7,800

Double Stage
Hot Water Absorption Chiller

30RT ~ 300RT 13 Models

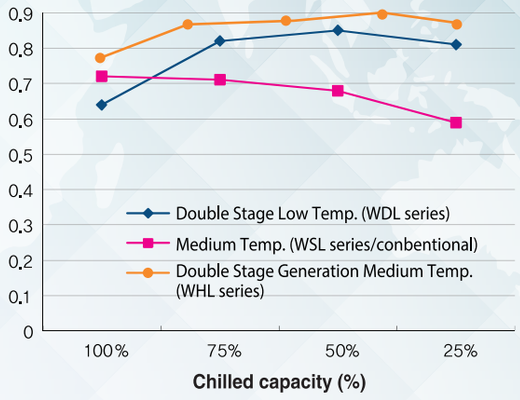
Hot Water Temp. : 95°C->75°C (ΔT20°C)

Hot Water temp. 95℃ → 75℃

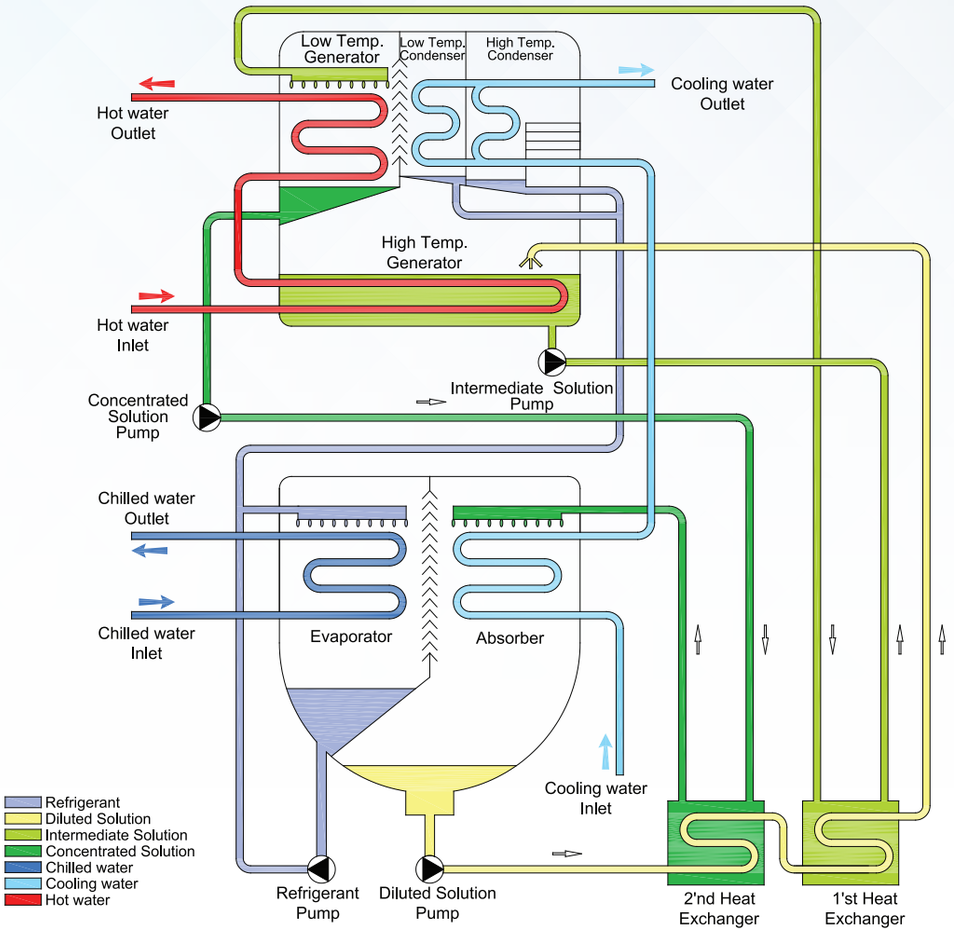
Economic Air-Condition

Chiller Type	Hot Water Temp. Inlet → Outlet	Temp. Gap
Conventional (General Chiller)	95℃ → 80℃	Δ15℃
WORLD EnC (New Developed Chiller)	95℃ → 75℃	Δ20℃

IPLV Graph



Cycle Diagram



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World EnC

SPECIFICATION [WHL Series]

Double Stage Hot Water Absorption Chiller

MODEL			UNIT	WHL 30	WHL 40	WHL 50	WHL 75	WHL 90	WHL 110	WHL 135	WHL 155	WHL 180	WHL 210	WHL 240	WHL 270	WHL 300
Cooling Capacity			kW	105	141	176	264	316	387	474	545	633	738	844	949	1,054
			usRT	30	40	50	75	90	110	135	155	180	210	240	270	300
Chilled Water	Temp. (inlet/outlet)		℃	12 / 7												
	Flow Rate		㎥/h	18.1	24.2	30.2	45.4	54.4	66.5	81.6	93.7	109.0	127.0	145.0	163.0	181.4
	Pressure Drop		mH_2O	7.3	8.3	7.0	6.4	6.8	9.6	10.5	9.5	9.6	9.7	9.5	10.2	10.5
	Connection Size		mm	65		80			100		125				150	
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37												
	Flow Rate		㎥/h	37.1	49.5	61.9	92.8	111.3	136.1	167.0	240.2	222.7	259.8	296.9	334.0	371.1
	Pressure Drop		mH_2O	8.9	9.8	12.0	8.4	8.8	8.0	8.7	12.0	8.5	7.5	7.6	7.5	7.3
	Connection Size		mm	80		100			125		150		200		250	
Hot Water	Temp.		℃	95 / 75												
	Flow Rate		ton/h	4.5	6.0	7.6	11.3	13.6	16.6	20.4	23.4	27.2	31.8	36.3	40.8	45.4
	Pressure Drop	Shell	mH_2O	1.6	2.0	3.4	3.1	3.2	4.3	4.8	4.3	4.3	5.1	4.9	4.9	4.7
		Control Valve	mH_2O	2.2	1.5	1.0	2.2	2.1	3.1	1.9	2.5	3.3	1.8	2.3	3.0	1.4
	Connection Size		mm	65							80				100	
	Control Valve Size		mm	25	40			50		65			80			100
Electic	Power Source		-	3Φ 400V 50Hz												
	Abs. Pump		kW (A)	1.6 (6.6)			1.8 (7.2)		2.1 (8.2)		2.8 (9.2)		3.2 (10.2)			
	Ref. Pump		kW (A)	0.2 (1.1)					0.3 (1.5)				0.4 (1.5)			
	Purge Pump		kW (A)	0.4 (1.4)												
	Control Panel		kW (A)	0.2 (0.5)												
	Total Ampere		kW (A)	2.4 (9.6)			2.6 (10.2)		3 (11.6)		3.7 (12.6)		4.2 (13.6)			
Size	Length[L]		mm	2,052		2,552	2,605		3,680		3,710		4,740		4,780	
	Width[W]		mm	1,351			1,370				1,520				1,810	
	Height[H]		mm	2,133			2,370				2,430				2,670	
Weight	Rigging		ton	2.2	2.3	2.8	4.0	4.2	5.1	5.3	6.1	6.4	7.5	7.8	9.7	10.1
	Operating		ton	2.6	2.7	3.3	4.7	4.9	5.7	5.9	6.8	7.1	8.3	8.7	10.8	11.2

Remark 1) 1usRT = 3,024 kcal/h

2) Available max. working pressure of chilled water /cooling water/hot water : 1.0MPa

3) Fouling factor 0.0001 m^2 h℃/kcal for Absorber and Condenser, 0.0001 m^2 h℃/kcal for Evaporator and Generator.

4) Catalogue specifications are subject to change without prior notice.

Hot Water Absorption Chiller

75RT ~ 1125RT 27 Models

WSL / Hot Water Absorption

1. Compact and Energy saving Design

With using high efficiency heat tube, smaller and lighter design to conventional things. Installation space also gets decreased.

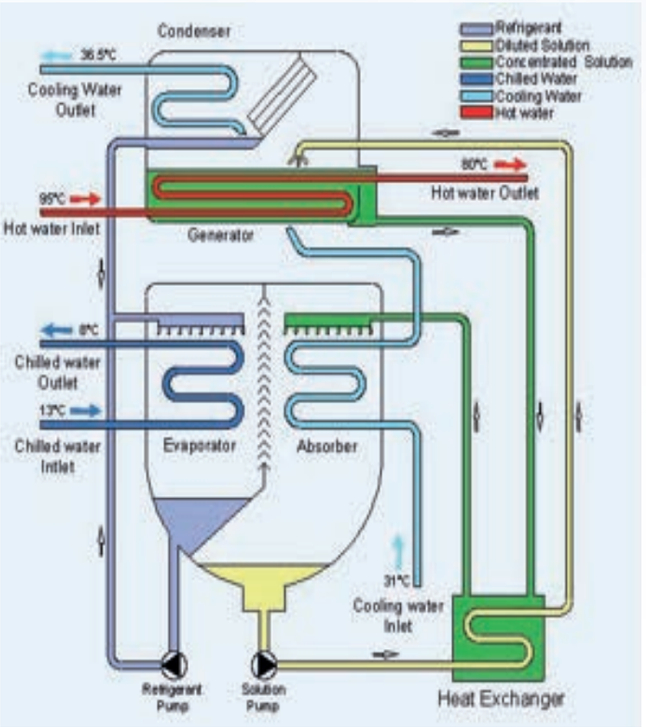
2. Easy operation and convenience

Full automatic system with up-to -date control technology such as operation, setting, monitoring, and control flow chart.

3. Safe and efficient chiller

Being operated in vacuum condition, it keeps internal pressure in vacuum status even in stop mode. With 2 pumps for solution and refrigerant, it is totally quiet. No noise and No vibration.

Hot water Absorption chiller operation flow chart



4. Maintenance cost reduction and only one purging during a season

Optimized operation condition and trouble-free system under strict manufacturing standard:
1 x 10 -6 atm.cc/sec leakage for a month.

5. High performance Automatic Purge system

An automatic purge unit to collect into a purge tank remaining Non-condensable gases in system and purge tank for storing Non-condensable gases make long time operation without manual purging.

SPECIFICATION [WSL Series]

Hot Water Absorption Chiller

Hot water inlet temp. 95℃

Model		Unit	WSL75	WSL90	WSL110	WSL135	WSL155	WSL180	WSL210	WSL240	WSL270	WSL300
Chilled water temp. at in-outlet		℃	12 / 7									
Cooling capacity		usRT	70	85	103	122	141	169	198	226	254	282
Chilled water	Flow rate	㎥/h	42.3	51.4	62.3	73.8	85.3	102.2	119.8	136.7	153.6	170.6
	Pressure drop	mAq	7.8	8.5	7.5	7.4	7.0	7.9	7.5	7.9	7.8	8.0
	Pipe size	㎜	80		100		125				150	
Cooling water	Flow rate	㎥/h	92.5	112.3	136.1	161.1	186.2	223.2	261.5	298.5	335.5	372.5
	Pressure drop	mAq	10.1	9.8	4.7	4.2	4.6	4.8	9.7	9.5	9.3	9.0
	Pipe size	㎜	125		150				200			
Hot water	Flow rate	㎥/h	19.6	23.8	28.8	34.2	39.5	47.3	55.4	63.3	71.1	79.0
	Pressure drop	mmAq	0.9	0.9	0.4	0.5	0.5	0.5	1.1	1.1	1.0	1.0
	Pipe size	㎜	65		80				100			
	Valve size	㎜	50	65		80			100			
Electricity	Power	-	3ϕ 400V 50Hz									
	Solution Pump	kW(A)	1.5(4.7A)				2.0(6.1A)		2.4(7.3A)			
	Refrigerant Pump	kW(A)	0.3(1.7A)						0.4(1.7A)			
	Purge Pump	-	0.4(1.5A)									
	Total Ampere	kW(A)	2.2 (7.9)				2.7 (9.3)		3.2 (10.5)			
Dimension	Length	㎜	2,640		3,680		3,686		4,744		4,776	
	Width	㎜	1,244		1,244		1,369		1,365		1,495	
	Height	㎜	2,255		2,255		2,389		2,389		2,575	
Weigh	Equipment weight	Ton	3.6	3.7	4.6	4.8	5.8	6.0	7.0	7.3	9.0	9.4
	Operation weight	Ton	4.1	4.3	5.3	5.6	6.7	7.1	8.2	8.7	10.6	11.1
	Conveyance	-	One body									

Remark

1) Standard pressure:
   Cooling and Chilled water:0.8Mpagf(8kgf/cm2G),
   Hot water standard pressure:1.6Mpa(16kgf/cm2G)
2) Chilled water standard TEMP:Inlet: 12℃, Outlet :7℃
   Cooling water standard TEMP: Inlet: 32℃, Outlet :37℃
3) Hot water standard TEMP: Inlet: 95℃, Outlet :80℃.
4) Power standard : 400V, 3Phase,50Hz,(220,440,460V also available)
5) The specification could be changed without any notice.

SPECIFICATION [WSL Series]

Hot Water Absorption Chiller

Hot water inlet temp. 95℃

Model		Unit	WSL340	WSL375	WSL420	WSL470	WSL525	WSL600	WSL675	WSL750	WSL825
Chilled water temp. at in-outlet		℃	12 / 7								
Cooling capacity		usRT	320	360	399	446	494	569	641	712	783
Chilled water	Flow rate	㎥/h	193.5	217.7	241.3	269.7	298.8	344.4	387.4	430.5	473.5
	Pressure drop	mAq	7.1	7.6	6.0	8.1	3.5	2.5	3.5	4.6	3.5
	Pipe size	㎜	200					250			300
Cooling water	Flow rate	㎥/h	422.7	475.5	527.0	589.1	652.5	752.1	846.1	940.2	1034.2 1
	Pressure drop	mAq	9.4	9.8	6.8	9.2	12.1	8.9	12.0	15.9	16.2
	Pipe size	㎜	250		300			350			400
Hot water	Flow rate	㎥/h	89.6	100.8	111.7	124.98	138.3	159.4	179.4	199.3	219.2
	Pressure drop	mAq	1.0	1.0	1.0	1.4	1.9	1.2	1.5	2.1	2.3
	Pipe size	㎜	125					150			200
	Valve size	㎜	125					150			200
Electricity	Power	-	3ϕ 400V 50Hz								
	Solution Pump	㎾(A)	2.4(7.3A)		3.0(10A)						4.5(16.2A)
	Refrigerant Pump	㎾(A)	0.4(1.7A)								1.5(4.0A)
	Purge Pump	-	0.4(1.5A)								
	Total Ampere	㎾(A)	3.2 (10.5)		3.8 (13.2)						5.3 (21.7)
Dimension	Length	㎜	4,780		4,870	5,410	5,910	5,618	6,116	6,641	7,141
	Width	㎜	1,595		1,955			2,200			
	Height	㎜	2,850		3,150			3,840			
Weigh	Equipment weight	Ton	10.7	11.7	14.9	16.2	17.4	20.8	22.5	24.0	28.3
	Operation weight	Ton	12.7	13.2	18.0	19.6	21.0	25.0	27.0	28.8	34.0
	Conveyance	-	One Body								

Option In different heat source and operation, the conditions can be selected as an option.
1) When the water pressure different from the standard.
2) When heat tube material is not copper nor with different tickness.
3) When Hot/cooling/chilled water temp. are different from standard.

Steam Fired Absorption Chiller

100RT ~ 1500RT 23 Models

WSA / Double Effect Steam Fired Absorption Chiller

Eco friendly and energy-saving design

WSA uses steam as the energy resource, LiBr as absorbent and water as refrigerant. With use of eco friendly materials, WSA does not raise the carbon dioxide which causes the global warming. The cost for electricity and operation can be saved in the area where steam is enough to use.

Reliable and efficient operation

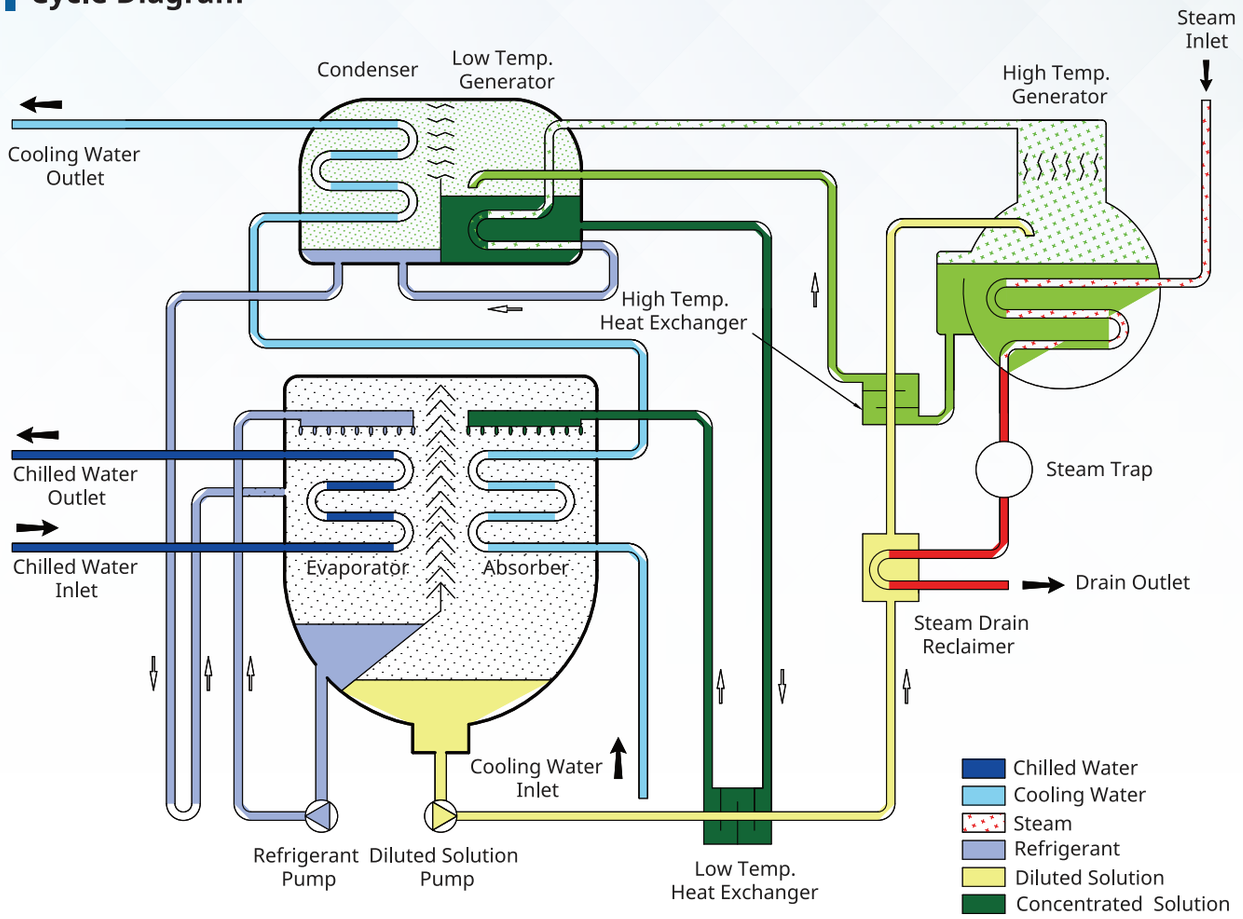
WSA is designed to enhance the reliability and durability. Inverter control of absorbent depending on cooling load makes efficient operation.

Intelligent operation system

Micro process control realizes precise control and efficient operation of the unit. And the user can operate the unit easily on the touch screen.

Steam Consumption: 3.5kg/h·RT ~ 4.4kg/h·RT

Cycle Diagram



SPECIFICATION [WSA Series]

Steam Fired Absorption Chiller

Model		Unit	WSA 010	WSA 012	WSA 015	WSA 018	WSA 021	WSA 024	WSA 028	WSA 032	WSA 036	WSA 040	WSA 045
Cooling capacity		usRT	100	120	150	180	210	240	280	320	360	400	450
		kW	352	422	528	633	739	844	985	1,125	1,266	1,407	1,583
Chilled Water	Temp. (inlet/outlet)	℃	12/7										
	Flow rate	ton/h	60.5	72.6	90.7	108.9	127.0	145.2	169.3	193.5	217.7	241.9	272.2
	P. Drop	mAq	6.5	6.4	8.0	8.3	7.5	7.9	5.1	5.5	5.8	6.1	5.2
	Connection	mm	100				125		150				
Cooling Water	Temp. (inlet/outlet)	℃	32/37										
	Flow rate	㎥/h	100	120	150	180	210	240	280	320	360	400	450
	P. Drop	mAq	3.9	4.4	6.5	7.7	5.6	6.2	10.9	12.1	8.7	9.4	10.3
	Connection	mm	125				150		200				
Steam	Flow rate	kg/h	440	530	660	790	920	1060	1230	1410	1580	1760	1980
	Steam Inlet onnect.	A	50				65				80		
	Drain Outlet onnect.	A	25								40		
	Control Valve Size	A	25	40					50				
Electric	Power Source		3ϕ 400V 50Hz										
	Abs. Pump #1	kW(A)	2.0 (6.0)				2.4 (7.5)		3.0 (11.0)		3.4 (10.2)		3.4
	Abs. Pump #2	kW(A)	0.4 (1.6)				1.2 (4.5)				1.5 (5.0)		1.5
	Ref. Pump	kW(A)	0.3 (1.5)				0.4 (1.5)						
	Purge Pump	kW(A)	0.4 (1.4)										
	Control Panel	kW(A)	0.2 (0.5)										
	Total Ampere	kW(A)	3.3 (11.0)				4.6 (15.4)		5.2 (18.9)		5.9 (18.6)		
Size	Length (L)	mm	2,632	2,832	3,644		3,670		4,720		4,860		4,910
	Width (W)	mm	1,775				1,880				2,110		2,250
	Height (H)	mm	2,030				2,300				2,550		2,780
Widght	Rigging	Ton	3.9	4.1	5.1	5.2	6.2	6.4	7.7	8.0	9.8	10.1	11.8
	Operation	Ton	4.3	4.5	5.6	5.8	6.9	7.2	8.6	9.0	11.0	11.4	13.5
Space for Tube Replacement		mm	2,400		3,400				4,500				

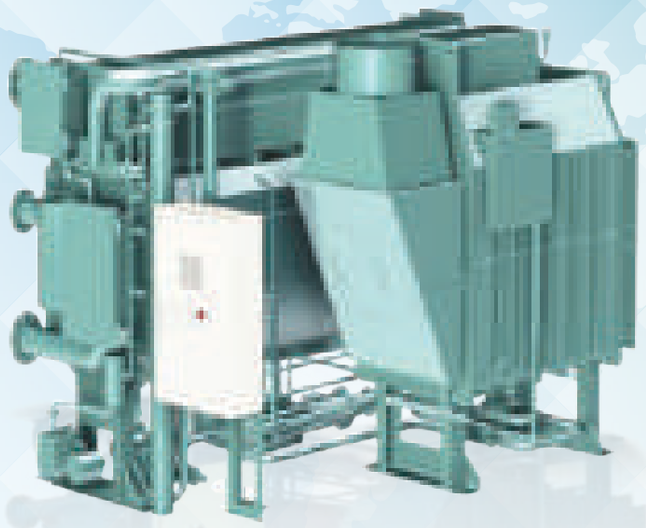
Remark

1) 1usRT = 3,024 kcal/h
2) Standard Steam Pressure is 0.8M
3) Working Pressure of chilled water and cooling water side is based on 1.0MPaPa
4) Fouling factor 0.0001m2·h·℃/kcal for Absorber and Condenser, 0.0001m2·h·℃/kcal for Evaporator.
5) Catalogue specifications are subject to change without prior notice.

Model		Unit	WSA 050	WSA 056	WSA 063	WSA 070	WSA 080	WSA 090	WSA 100	WSA 110	WSA 120	WSA 130	WSA 140	WSA 150
Cooling capacity		usRT	500	560	630	700	800	900	1000	1100	1200	1300	1400	1500
		kW	1,758	1,969	2,216	2,462	2,814	3,165	3,517	3,869	4,220	4,572	4,924	5,275
Chilled Water	Temp. (inlet/outlet)	℃	12/7											
	Flow rate	ton/h	302.4	338.7	381.0	423.4	483.8	544.3	604.8	665.3	725.8	786.2	846.7	907.2
	P. Drop	mAq	5.5	4.6	6.2	8.1	4.7	6.4	8.4	6.2	7.9	9.8	8.0	9.8
	Connection	mm	200				250			300			350	
Cooling Water	Temp. (inlet/outlet)	℃	32/37											
	Flow rate	㎥/h	500	560	630	700	800	900	1000	1100	1200	1300	1400	1500
	P. Drop	mAq	11.2	7.1	9.4	12.1	8.4	11.1	14.3	8.8	10.9	13.4	12.3	14.6
	Connection	mm	250	300			350			400				
Steam	Flow rate	kg/h	2200	2460	2770	3080	3520	3960	4400	4840	5280	5720	6160	6600
	Steam Inlet onnect.	A	80	100			125			150				
	Drain Outlet onnect.	A	40	50			65			80				
	Control Valve Size	A	65			80				100				
Electric	Power Source		3 ø 400V 50Hz											
	Abs. Pump #1	kW(A)	3.4(10.2)	5.5 (20.0)			6.6 (16.2)			7.5 (25.0)				
	Abs. Pump #2	kW(A)	1.5 (5.0)	2.0 (6.0)			2.2 (7.0)			4.5 (16.0)				
	Ref. Pump	kW(A)	0.4 (1.5)				1.5 (4.0)							
	Purge Pump	kW(A)	0 4 (1.4)											
	Control Panel	kW(A)	0.2 (0.5)											
	Total Ampere	kW(A)	5.9 (18.6)	8.5 (29.4)			10.9 (29.1)			14.1 (46.9)				
Size	Length (L)	mm	4,910	5,040	5,580	6,080	5,720	6,220	6,740	6,150	6,670	7,170	6,830	7,330
	Width (W)	mm	2,250	2,480			2,825			3,000			3,250	
	Height (H)	mm	2,780	3,255			3,400			3,600			3,650	
Widght	Rigging	Ton	12.1	16.6	18.1	19.4	24.6	26.3	28.3	31.8	33.9	35.8	39.6	41.8
	Operation	Ton	13.9	19.2	20.8	22.3	28.7	30.7	32.8	36.4	38.8	40.9	45.3	47.7
Space for Tube Replacement		mm	4,500		5,200	5,700	5,200	5,700	6,200	5,700	6,200	6,700	6,200	6,700

Exhaust Gas Absorption Chiller & Heater

100RT ~ 1500RT 23 Models

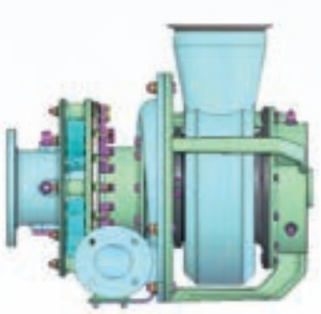


WEG / Chilled water 12 → 7℃

1. Waste exhaust gas can be used for drive heat source.
2. Convertible use of cooling and heating
3. Energy saving product
4. Increase in the efficiency of total energy
5. No power overload in summer season
6. Environment-friendly to use water as refrigerant

Development of diverter valve

- Working at high temp 500℃. Endurability
- Maximum flow for exhaust gas: 90kg/min



Exhaust gas
576℃

Exhaust gas
526℃

Chilled water :12→7℃

150℃
Exhaust Gas Outlet

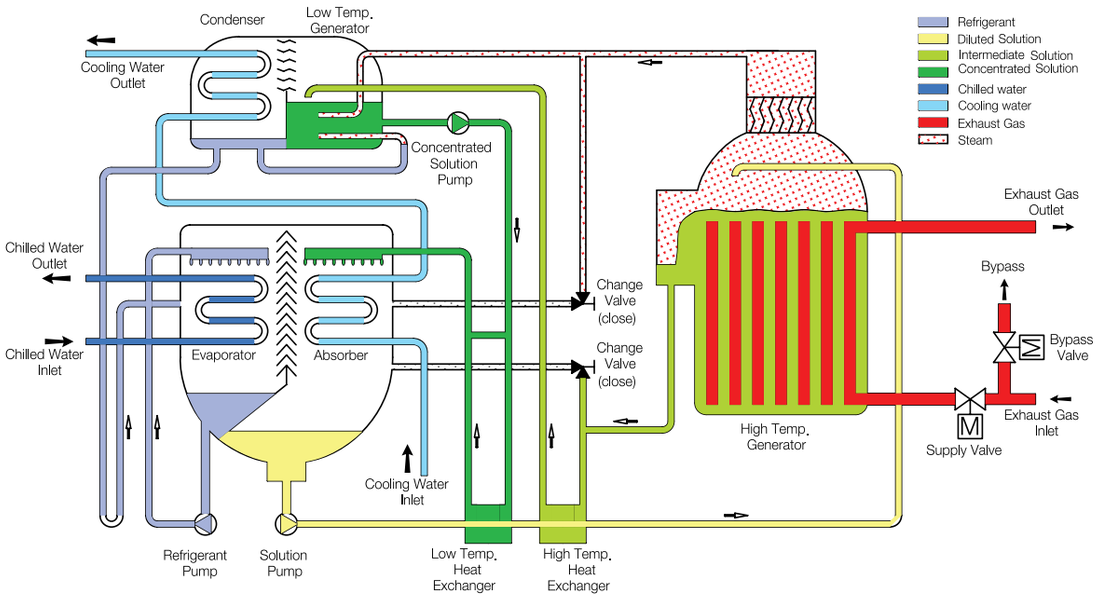
High temp. generator

- Vertical water tube - Fin tube, 1 Pass
- UA
- Loss of pressure calculation
- Endurable from high temp corrosion

CYCLE DIAGRAM

Exhaust Gas Absorption Chiller & Heater

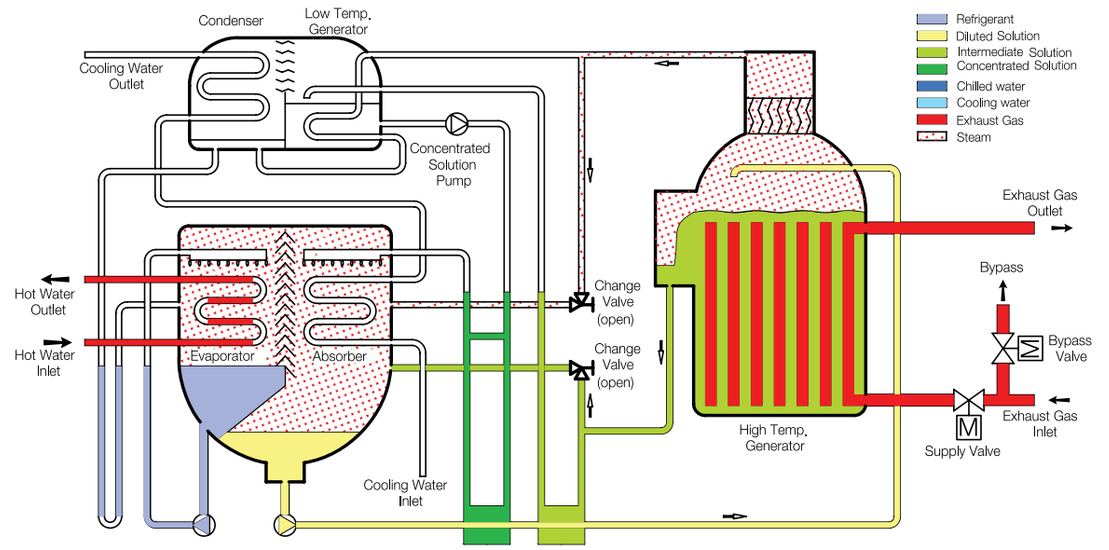
Cooling Cycle Diagram



Cooling Cycle

High Temp. Generator	Refrigerant Steam	Low Temp Generator	Condenser	Low Temp Generator	Absorber	Low Temp Heat Exchanger	High Temp Heat Exchanger	High Temp Generator
	Solution	High Temp Generator	Low Temp Generator	High Temp Generator				

Heating Cycle Diagram



Heating Cycle

High Temp. Generator	Refrigerant Steam	Evaporator	Soulution Pump	Low Temp Heat Exchanger	High Temp Heat Exchanger	High Temp Generator	
	Solution	Absorber					

SPECIFICATION [WEG Series]

Exhaust Gas Absorption Chiller & Heater

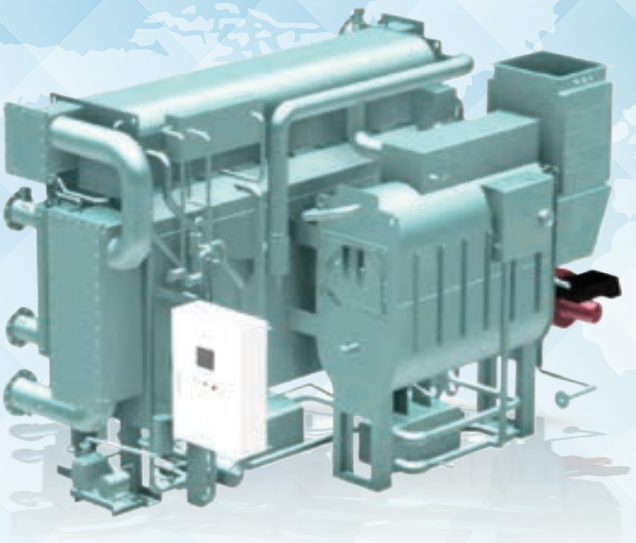
Model			Unit	WEG 010	WEG 012	WEG 015	WEG 018	WEG 021	WEG 024	WEG 028	WEG 032	WEG 036	WEG 040	WEG 045
Cooling capacity			usRT	100	120	150	180	210	240	280	320	360	400	450
			kW	351	422	527	633	738	844	984	1,125	1,265	1,406	1,582
Heating capacity			Mcal/h	283	340	425	510	595	680	793	906	1019	1133	1274
			kW	329	395	494	592	691	790	922	1053	1185	1317	1481
Chiiled Water	Temp. (inlet/outlet)		℃	12 / 7										
	Flow rate		㎥/h	60.5	72.6	90.7	109	127	145	169	194	218	242	272
	P. Drop		mAq	4.8	5.1	6.6	7.0	6.4	6.3	4.6	4.5	5.0	5.1	4.4
	Connection		㎜	100				125		150				
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37										
	Flow rate		㎥/h	100	120	150	180	210	240	280	320	360	400	450
	P. Drop		mAq	11.1	11.3	11.5	11.8	11.8	12.1	11.2	10.7	11.1	10.8	10.7
	Connection		㎜	125		150				200				250
Exhaust Gas	Temp.		kg/sec	0.88	1.05	1.32	1.58	1.84	2.11	2.46	2.81	3.16	3.51	3.95
	Temp.	Cooling	℃	450/165										
		Heating	℃	450/125										
	P. Drop		mmAq	77	82	79	92	97	113	129	131	123	131	133
	Outlet Conn		㎜	400				500				600		
	Diverter Valve		㎜	400				500				600		
Electric	Power source		-	3ϕ 400V 50Hz										
	Abs. Pump		kW(A)	2.0(5.7)				2.4(6.1)				3.4(9.0)		
	Ref. Pump		kW(A)	0.3(1.5)				0.4(1.6)						
	Purge Pump		kW(A)	0.4(1.4)										
	Control Pump		KVA	0.2(0.5)										
	Amp. (400 Vac)		kW(A)	2.9(9.10)				3.4(9.6)				4.4(12.5)		
Size	Length (L)		㎜	2,597		3,680		3,686		4,744		4,776		4,954
	Width (W)		㎜	1,662	1,740	1,857	1,935	2,150	2,189	2,267	2,375	2,270	2,309	2,491
	Height (H)		㎜	1,979				2,303				2,470		2,744
Weight	Rigging		㎜	5.0	5.3	6.4	6.8	7.9	8.5	9.8	10.3	12.8	13.2	15.7
	Operation		Ton	5.4	5.8	7.0	7.4	8.6	9.3	10.7	11.3	14.0	14.6	17.2
Tube exchange space			Ton	2,400		3,400				4,500				

Remark Working Pressure of each water side is based on 1.0Mpu(150psig.)

Model			Unit	WEG 050	WEG 056	WEG 063	WEG 070	WEG 080	WEG 090	WEG 100	WEG 110	WEG 120	WEG 130	WEG 140	WEG 150
Cooling capacity			usRT	500	560	630	700	800	900	1000	1100	1200	1300	1400	1500
			kW	1,757	1,968	2,214	2,460	2,812	3,163	3,515	3,866	4,218	4,569	4,921	5,272
Heating capacity			Mcal/h	1416	1586	1784	1982	2266	2549	2832	3115	3398	3682	3965	4248
			kW	1646	1843	2074	2304	2633	2962	3291	3621	3950	4279	4608	4937
Chiiled Water	Temp. (inlet/outlet)		℃	12 / 7											
	Flow rate		㎥/h	302	339	381	423	484	544	605	665	726	786	847	907
	P. Drop		mAq	3.9	3.6	5.0	6.6	4.7	6.4	8.5	7.2	9.2	11.5	8.3	10.2
	Connection		㎜	200				250			300			350	
Cooling Water	Temp. (inlet/outlet)		℃	32 / 37											
	Flow rate		㎥/h	500	560	630	700	800	900	1000	1100	1200	1300	1400	1500
	P. Drop		mAq	10.8	7.7	10.6	14.0	8.7	11.8	15.6	3.0	3.8	4.8	4.0	4.9
	Connection		㎜	250	300			350			400				
Exhaust Gas	Temp.		kg/sec	4.39	4.92	5.53	6.15	7.03	7.91	8.78	9.66	10.54	11.42	12.30	13.18
	Temp.	Cooling	℃	450/165											
		Heating	℃	450/125											
	P. Drop		mmAq	134	143	133	146	155	153	176	213	221	212	206	184
	Outlet Conn		㎜	600	750						1000				
	Diverter Valve		㎜	600	750						1000				
Electric	Power source			3ϕ 400V 50Hz											
	Abs. Pump		kW(A)	3.4 (9.0)	5.5 (14.3)						7.5 (21.9)				
	Ref. Pump		kW(A)	0.4(1.6)				1.5(3.8)							
	Purge Pump		kW(A)	0.4(1.4)							0.7 (2.2)				
	Control Pump		KVA	0.2(0.5)											
	Amp. (400 Vac)		kW(A)	4.4(12.5)	6.5 (17.8)			7.6 (20.0)			9.95 (28.4)				
Size	Length (L)		㎜	4,954	4,998	5,540	6,038	5,460	5,958	6,483	6,293	6,818	7,318	6,974	7,475
	Width (W)		㎜	2,569	2,934	3,069	3,459	3,330	3,480	3,530	4,348	4,448	4,598	4,932	5,182
	Height (H)		㎜	2,744	3,057			3,390			3,678			3,700	
Weight	Rigging		㎜	16.5	21.2	23.1	24.6	31.0	33.6	35.6	41.1	43.4	46.4	50.2	54.1
	Operation		Ton	18.1	23.7	25.8	27.5	34.8	37.6	39.9	46.2	48.8	52.1	56.5	60.8
Tube exchange space			Ton	4,500		5,200	5,700	5,200	5,700	6,200	5,700	6,200	6,700	6,200	6,700

Multi-Fuel Absorption Chiller & Heater

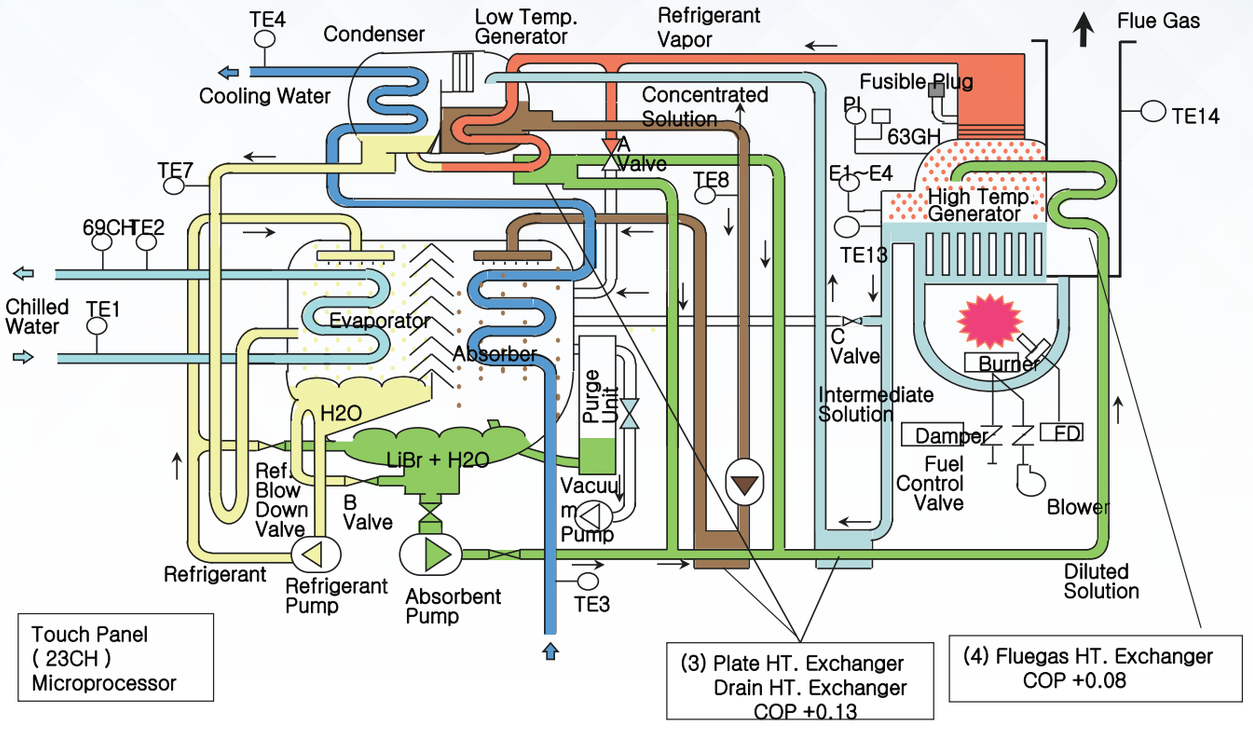
100RT ~ 1000RT



This model is designed to use different energy resource for cooling and heating. Exhaust gas, steam and hot water can be used with gas or oil.

Heat resource: Natural Gas, Oil, Steam, Hot Water

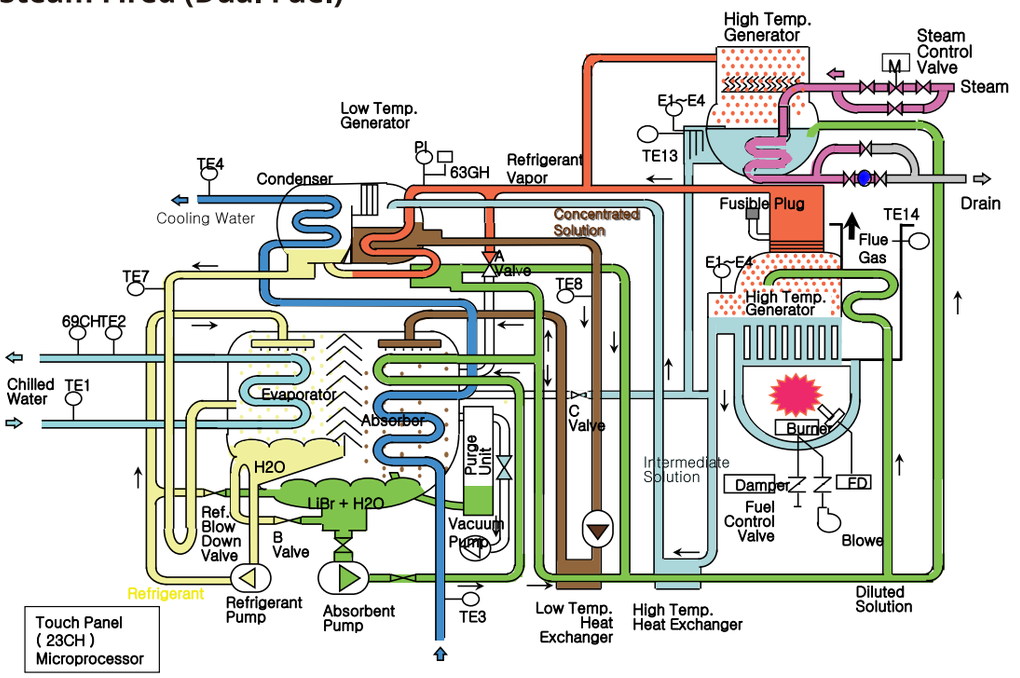
Cycle Diagram



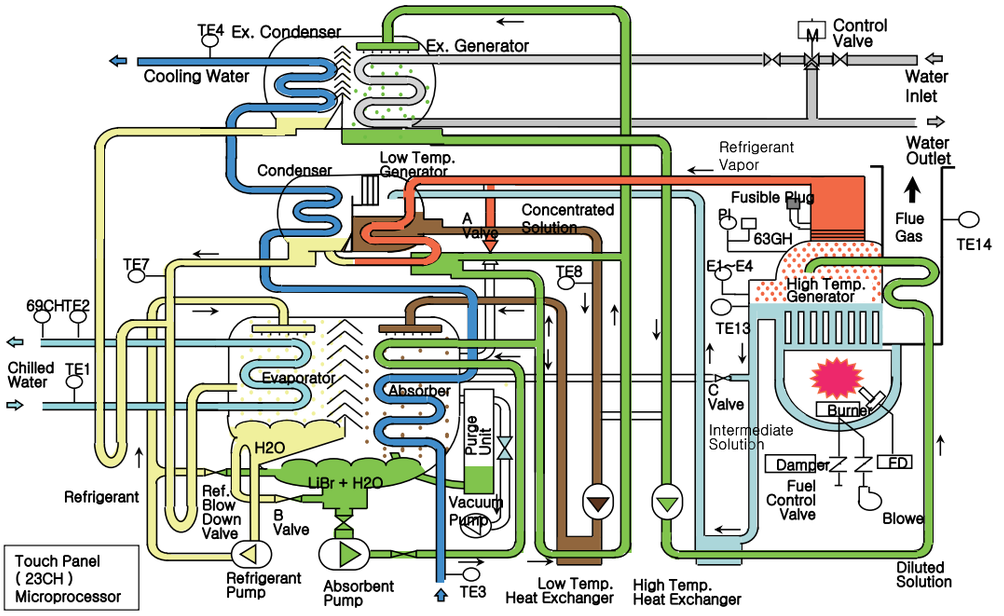
CYCLE DIAGRAM

Multi-Fuel Absorption Chiller & Heater

Gas & Steam Fired (Dual Fuel)



Gas & Water Fired (Dual Fuel)

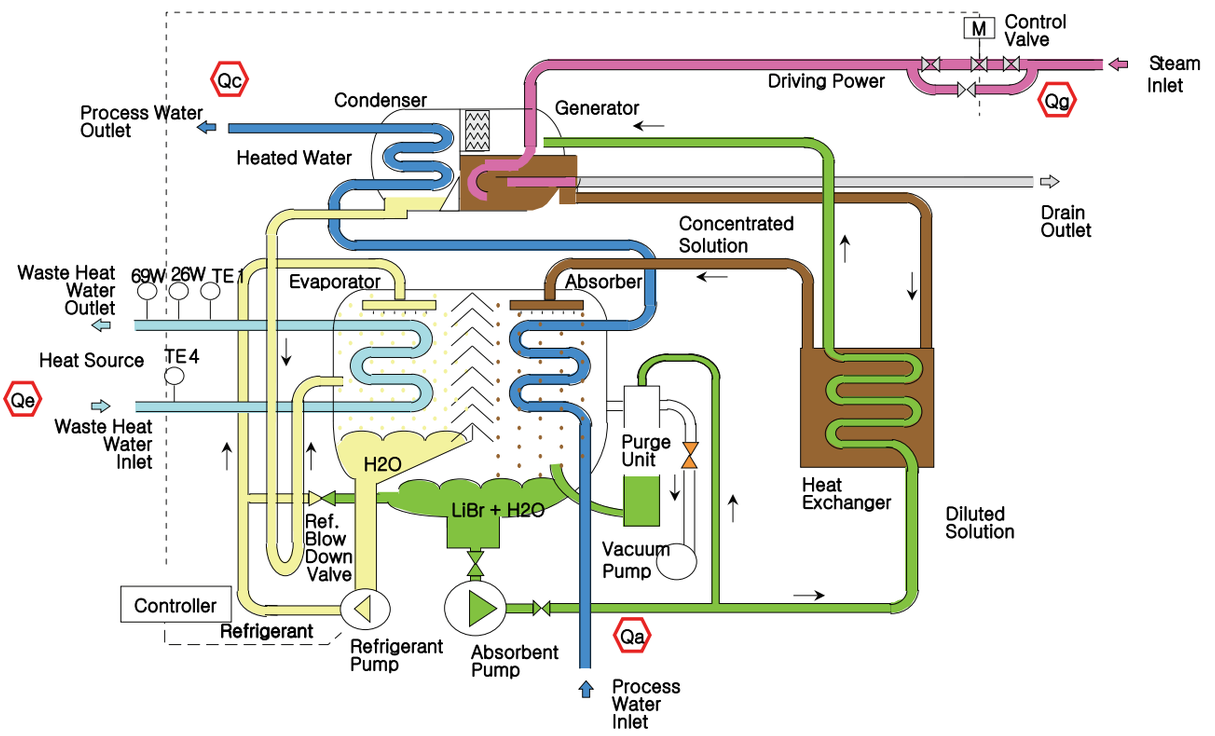


HEAT PUMP

ABSORPTION HEAT PUMP

Absorption Heat Pump developed to produce medium temperature energy by using high temperature energy resource such as steam, hot water and exhaust gas and low temperature waste heat energy.
This Absorption Heat Pump can be used to supply hot water for heating in a building or to supply hot water in the process of factory by using waste heat resource.

Cycle Diagram(Heated Water)



Generator Vapor is generated from heat supplied by driven hot water and the generated vapor is moved into Condenser.

Condenser The vapor is condensed on the tubes and the heat is transferred to hot water inside the tubes.

Evaporator The evaporator takes evaporating heat from the waste hot water and the evaporated vapor moves into Absorber.

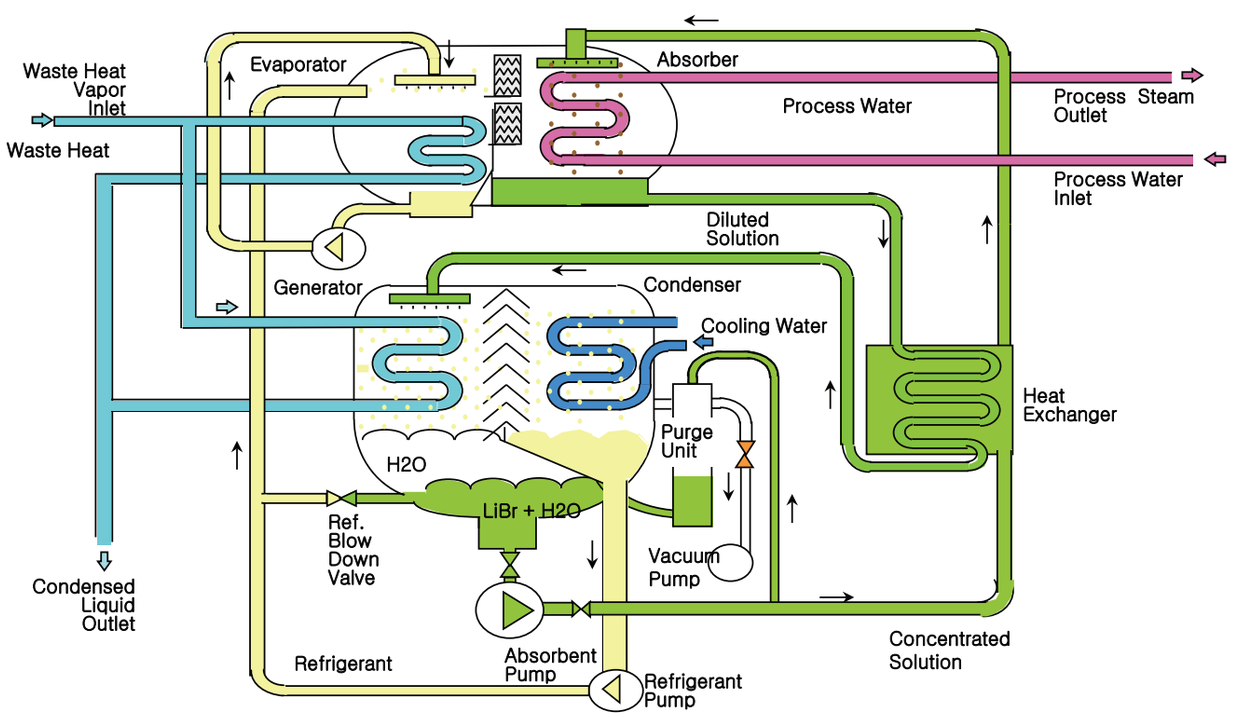
Absorber The evaporated vapor is absorbed into concentrated solution coming from a generator and the heat is transferred to process hot water.

Absorption Heat Transformer

ABSORPTION HEAT PUMP

Absorption Heat Transformer developed to produce high temperature energy by using medium temperature energy resource in the process of factory.
This Absorption Heat Transformer can be used in the plants that have high temperature waste heat resource to recycle it.

Cycle Diagram(Steam Gene.)



Generator Vapor is generated from heat supplied by driven hot water and the generated vapor is moved into Condenser.

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Evaporator The evaporator takes evaporating heat from the waste hot water and the evaporated vapor moves into Absorber.

Absorber The evaporated vapor is absorbed into concentrated solution coming from a generator and the heat is transferred to process hot water.

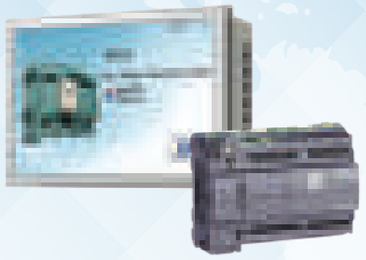
Control System

Care of Service Convenience & Customer Satisfaction

- Latest PLC with 10 inch touch screen, remote control and BAS compatible
- Increase chiller's efficiency with precise PID control
- Applicable for Modbus, Ethernet, BAC Net TCP/IP
- Chiller's status can be monitored through PLC Web connection (Option)

You can have the innovative technology through WORLD EnC only

PLC



Touch Screen & Color Monitor

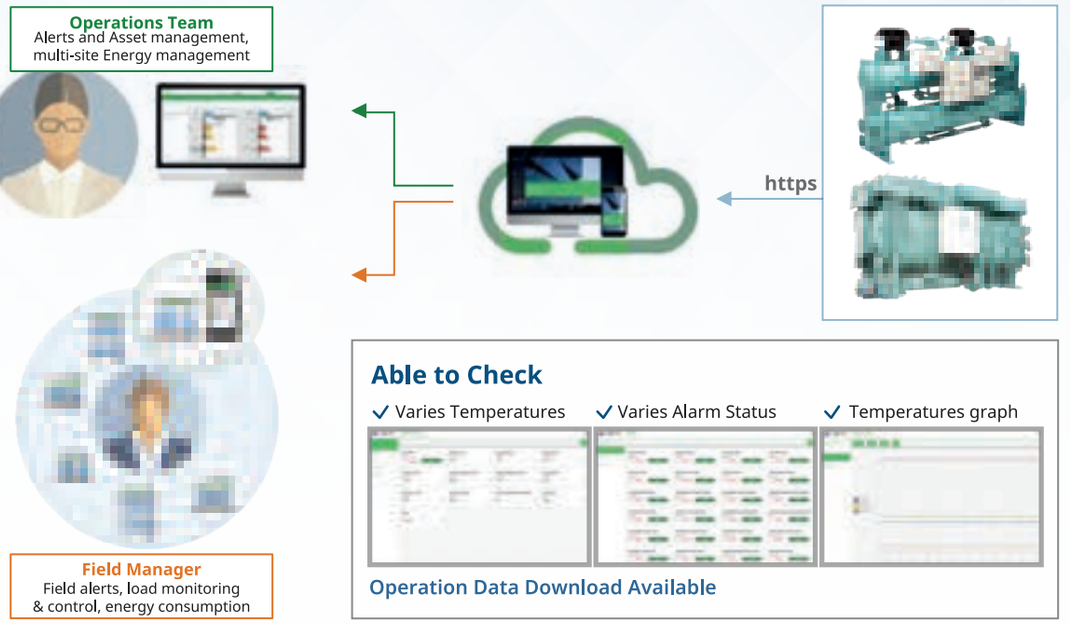
- Control Program is composed of single-effect and double-effect
- Single-effect standard Logic
  : Base on Double-lift Hot Water Absorption Chiller
- Double-effect standard Logic
  : Base on Direct-fired Absorption Chiller and Heater
- Touch program is constructed by each model

Customized System

- Temperature sensor : PT1000
- Analog Input : 12 Port
- Analog Output : 4 Port
- Digital Input : 12 Port
- Digital Output : 12 Port
- RS-485C, RS-TCP/IP, VNC

- Operation history will be saved for 168 hours once every 10 seconds
- Increase the saving period up to 6 months once every 5 seconds with 2GB SD momery card (Option)
- Alarm history will be stored continuously from the initial chiller operation (unless deleted)

Web Mornitoring



1. Possible to check real-time and past data for temperature, alarm and operation of various job sites and remotely control various set values.
2. Field and building managers use the Web Monitoring system to check and control the data for 24 hours a day, 365 days a year on PC & Mobile devices.
3. By using the Web Monitoring system, it is possible to monitor the alarm value in real-time of the chiller anywhere (work, home, even on the move), then detect abnormalities that occur during operation, and respond immediately.

FIELD INSTALLED

World Enc

Korea

Government Complex in Sejong City Administrative Complex
Hot water / 600RT 8 units

Incheon International Airport
Hot water / 975RT 8 units

Gimpo Airport Sky Park
Hot water / 700RT 13 units

Lotte Chemical Daesan Plant
Hot water / 1,300RT 3 units,
975RT 1 unit

Heungdeok IT Valley
Hot water / 825RT 2 units,
270RT 2 units, 155RT

Lotte Department Store Dongtan
Hot water / 820RT 10 units,
280RT 2 units

Pangyo Mtek Vision Office
Hot water / 600RT 3 units,
340RT 10 units

Lotte Mart Suwon Branch
Direct Fired / 700RT 6 units

Lotte Chemical Yeosu Plant
Hot water / 525RT 2 units,
Steam 1100RT

Korea Zinc Onsan Refinery
Steam / 500RT 2 units

Inha University Hospital
Direct Fired / 800RT 4 units

Dongtan Hallym University Hospital
Hot water / 900RT 2 units

FIELD INSTALLED

World Enc

Korea

Galleria Department Store Gwanggyo
Hot water / 750RT 6 units, 190RT 2 units

Songdo Landmark Prugio City
Hot water / 600RT 2 units,
400RT units, 200RT units

Magok Genexine Handok RND Center
Hot water / 600RT 2 units,
380RT 2 units, 135 / 110RT

Changdong Station Cultural Industrial Complex Complex
Direct Fired / 560RT 4 units

Gwangmyeong Lotte Outlet
Hot water / 600RT 7 units,
135RT 2 units

Homeplus Sosa
Direct Fired / 600RT 5 units

Homeplus Suwon Homesil
Hot water / 600RT 2 units

E-Mart (Paju Unjeong / Asan Baebang)
Hot water / 575RT 2 units,
525RT 2 units

Lakeside Gwanggyo Residential Complex
Hot water / 675RT 2 units,
525RT 2 units

Lotte Songdo Residential Complex
Hot water / 470RT 2 units,
340RT 4 units

Lotte Cheongna Residential Complex
Direct Fired / 500RT 2 units

POSCO Gwanggyo Residential Complex
Hot water / 525RT 3 units,
135RT 2 units

Italy / Mexico / Germany

New Treviso Hospital in Italy
Hot water / 420RT 1 unit

Pordenone Hospital in Italy
Hot water / 210RT 2 units

IBI Pharmaceutical Spa in Italy
Hot water / 180RT 1 unit

Vetropack in Italy
Hot water / 155RT 2 units

FOE HOTEL ALBA in Italy
Hot water / 135RT 1 unit

SYMBIOSIS MILANO in Italy
Hot water / 75RT 1 unit

Hotel in Brescia in Italy
Hot water / 75RT 1 unit

Catapult Factory in Mexico
Hot water / 110RT 1 unit

HEWMEG in Germany
Hot water / 900RT 1 unit,
600RT 2 units

3M – Hilden in Germany
Hot water / 240RT 1 unit

Militeny Biotec in Germany
Hot water / 90RT 2 units

Tornow in Germany
Hot water / 75RT 1 unit

FIELD INSTALLED

World Enc

Poland / Iran / Pakistan

JEDRUS in Poland
Hot water / 90RT 2 units

Hospital Trigen in Poland
Hot water / 60RT 2 units

PGNiG in Poland
Direct Fired / 180RT 1 unit

Żołynia in Poland
Direct Fired / 60RT 2 units

Lexon Tower in Iran
Direct Fired / 630RT 2 units

Bahar Hospital in Iran
Steam Fired / 500RT 2 units

Tehran Hospital in Iran
Direct Fired / 360RT 1 unit

R&D Center in Iran
Direct Fired / 240RT 1 unit

NEE in Pakistan
Direct Fired / 1400RT 2 units

PSPC/SPC in Pakistan
Direct Fired / 500RT & 360RT

Karachi Hospital in Pakistan
Hot water / 375RT 1 unit

Hotel OA in Pakistan
Hot water / 240RT 1 unit

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