EBARA

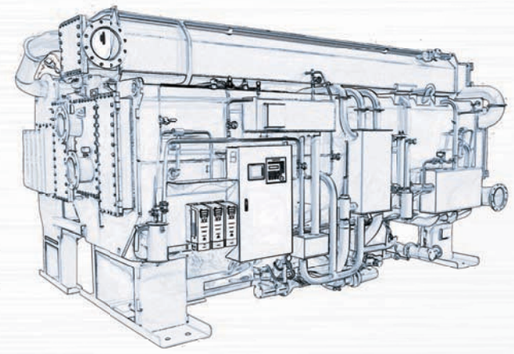
EBARA-ALWAYS BENEFITING THE EARTH

RGD

DIRECT-FIRED ABSORPTION CHILLER

Cooling Tower Industrial Blower Electrical Chiller Absorption Chiller

WWW.YTEBARA.COM.CN



YANTAI EBARA AIR CONDITIONING EQUIPMENT CO.,LTD.

EBARA

YANTAI EBARA AIR CONDITIONING EQUIPMENT CO., LTD.

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Absorption Chiller Electrical Chiller Industrial Blower Cooling Tower

CONTENTS

DIRECT-FIRED ABSORPTION CHILLER RGD 02

Ebara- An International famous brand
for Superior Environment
Friendly Products

EBARA

ALL AROUND THE WORLD

AN ENVIRONMENTALLY FRIENDLY COMPREHENSIVE
ENGINEERING COMPANY

Ebara All Around The World

EBARA Corporation

Ebara Corporation is one of the world's largest manufacturers of pumps, compressors, fans, heat pumps and other HVAC and refrigeration equipment. Since its establishment in 1912, Ebara Corporation has been fully dedicated to protecting the environment with a comprehensive and contemporary commitment. “Ebara-Always Benefiting the Earth” is the philosophy that guides Ebara corporate strategy.

Yantai EBARA Company Profile

Yantai Ebara Air Conditioning Equipment Co., Ltd. established in 1996, is the only overseas production base of Ebara Japan for manufacturing air conditioning equipment including absorption heat pumps, absorption chiller (heat pump), centrifugal chiller (heat pump), screw chiller(heat pump), cross-flow (closed) type cooling tower,evaporative condenser, etc. Its products are exported to JAPAN and all over the world. Yantai Ebara always keeps up with the products and technology development of Ebara Japan.

TRUST & EXPECTATION

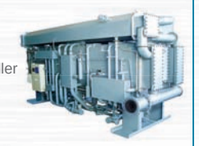
BEYOND BOUNDARIES

1962
Start producing absorption chiller in 1962

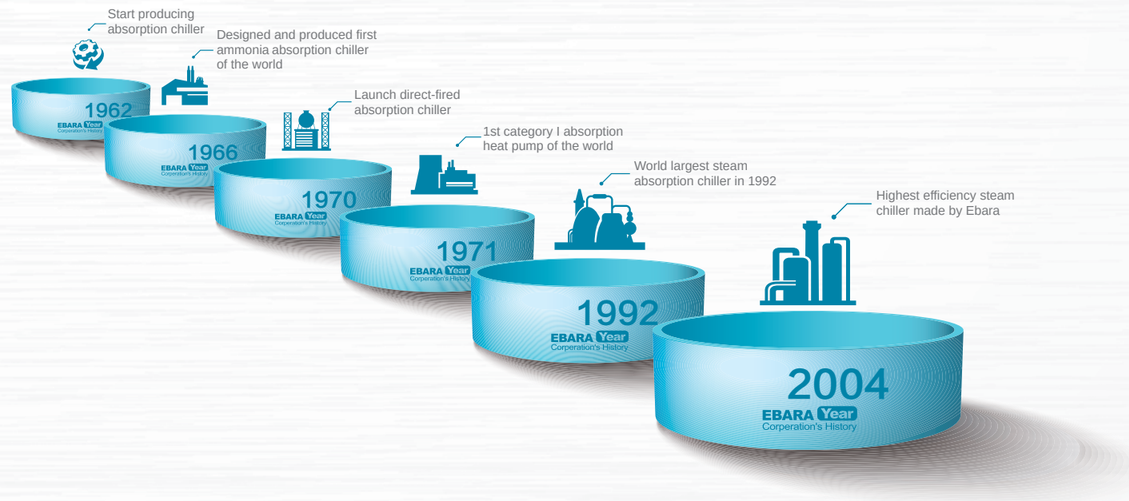
1967
1st double effect absorption chiller launched in 1967

1992
World largest steam absorption chiller in 1992

2004
Highest efficiency steam chiller made by Ebara



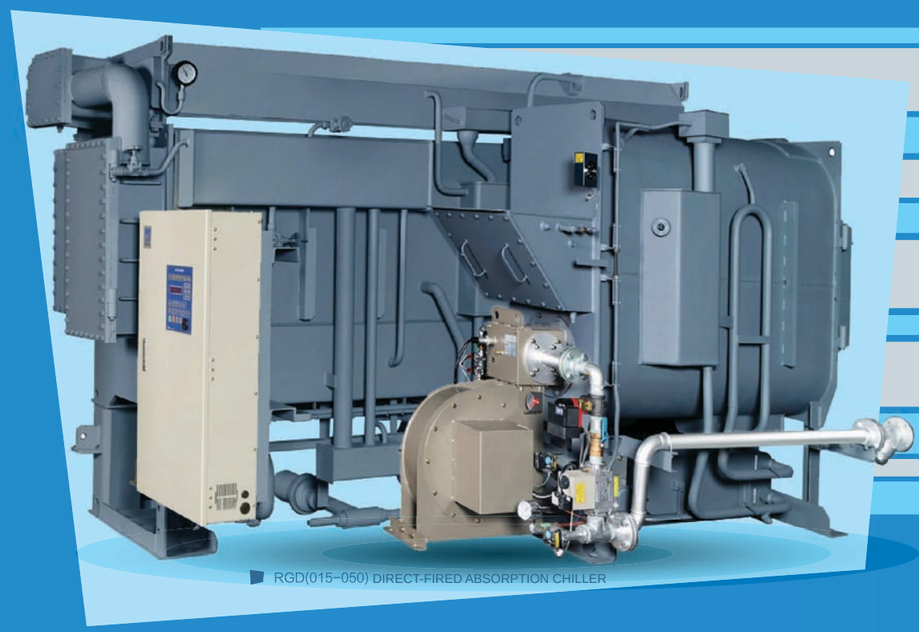
Product Development History



RGD (150-500RT)

SMALL UNIT
FEATURES

Product feature



RGD(015~050) DIRECT-FIRED ABSORPTION CHILLER

High Efficiency Drastically reduce fuel consumption, energy-saving, leading technology of industry.

High Intelligence Control System English colorful touch screen interface, visual display of running parameters, fault record, flow chart, performance curve, etc. Easy operation, standard design of fault auto diagnosing, communication interface, chiller interlocking control, etc.

Dilution Time Control According to the strong solution concentration when machine stops, the system will calculate optimum dilution operation time to reduce energy consumption. Min. dilution time is only 5 minutes.

Unique Counter flow path Less heat loss, high efficiency, safe and reliable, suitable for poor working conditions.

Energy Efficiency Enhancing Design Integrated with plate heat exchanger as refrigerant water condensate heat exchanger, high and low temperature heat exchanger, which can significantly improve the heat recovery efficiency by reducing the temperature difference of heat exchanging.

Super-high Partial Load Efficiency Both solution pump and spray pump are equipped with VFD as standard design. Pump speed is controlled by pressure difference signal, it is more sensitive and more accurate, in addition, such design will improve chiller partial load efficiency.

Auto-purge System Vacuum pump automatic purge the non-condensable gas according to chiller operating condition.

Multi Anti-crystallization Design Adopt duplicated and patented refrigerant level detecting devices to prevent crystallization in evaporator. A “J” type tube is installed as overflow tube in low temperature generator to melt the crystallization in case it happens. Auto-diluting process will start after power off.

Ultra Low Pressure Spray Adopt Ebara patented super low pressure spray nozzle technology for solution and refrigerant spraying, better pulverization, larger wetting surface, increase absorption effect. As the nozzle inlet is higher than spray basin bottom, the rust can’t pass and block it.

Multi-Energy Type Chiller (Optional, NG+Hot water) If there is hot water available and temp. is >90℃ then Ebara recommend this NG + Hot Water chiller. Compared with single natural gas drive absorption chiller, gas plus hot water type chiller can save up to 30% natural gas consumption.

Special-designed burner Designed by both Ebara and its supplier, and burner is dedicated for Ebara direct fired absorption chiller. This burner can control fuel and air volume more precisely, and achieve higher combustion efficiency. The burner emission can reach different international environment standards.

Product Nomenclature

RGD — Series name

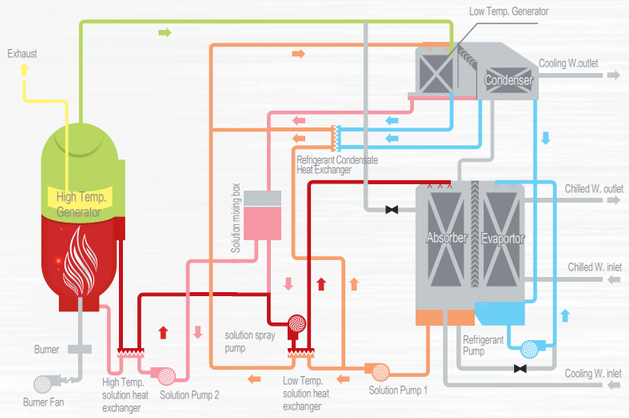
025 — Cooling capacity 250 USRT

□ — H:HTG Enlarge Ⅰ
F:HTG Enlarge Ⅱ

RGD

REFRIGERATION
PRINCIPLE

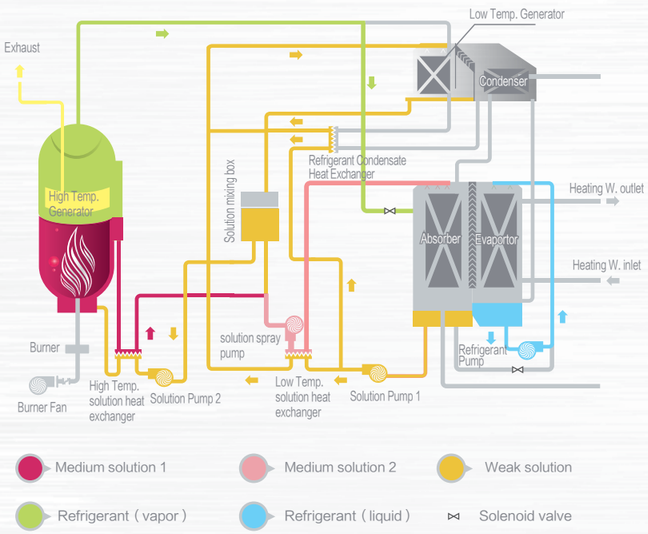
Working Principle



Liquid refrigerant evaporate in the evaporator and cool the chilled water. Then refrigerant vapor goes into absorber, absorbed by strong solution. The strong solution become to weak solution. Solution pump circulates this weak solution back to low temperature generator. In this vessel, weak solution is heated by refrigerant vapor from high temperature generator and evaporate to medium solution. The medium solution goes into high temperature generator and heated by direct fired natural gas. The strong solution is mingled with medium solution in high temperature heat exchanger, and then comes into absorber through low temperature heat exchanger to absorb refrigerant vapor from evaporator. Refrigerant produced in low temperature generator is cooled by cooling water in condenser to return to evaporator.

Heating Theory

Steam vapor from high temp. generator goes into evaporator, heat the hot water and become condensate water. Refrigerant mix with the mid solution from high temp. generator and become weak solution, then pumped to high temp. generator.



TECHNICAL
DATA SHEET

Performance Data

015–050

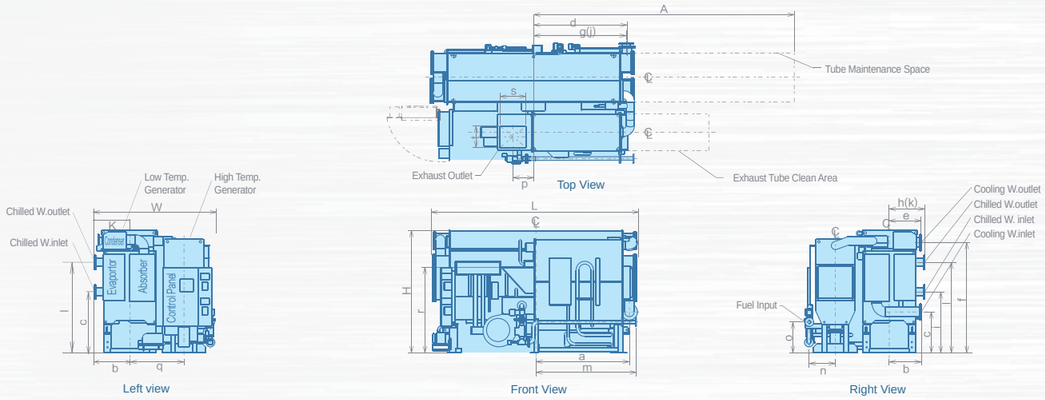
Model(RGD–)			単位	015	018	021	025	028	032	036	040	045	050
Cooling capacity			USRt	150	180	210	250	280	320	360	400	450	500
			10^4kcal/h	45.4	54.4	63.5	75.6	84.7	96.8	108.9	121.0	136.1	151.2
			kW	528	633	739	879	985	1125	1266	1407	1583	1759
Heating capacity			10^4kcal/h	38.1	45.7	53.3	63.5	71.1	81.3	91.4	101.6	114.3	127.0
			kW	443	532	620	739	827	945	1064	1182	1329	1477
Chilled water	Chilled W.outlet temp		℃	12℃→7℃ 55.8℃→60℃									
	Flow rate		m^3/h	90.7	108.9	127.0	151.2	169.3	193.5	217.7	241.9	272.2	302.4
	Pressure drop		mh_2O	9.8	10.0	9.7	9.9	9.2	9.4	9.5	9.7	9.1	9.3
			kPa	96	98	95	97	91	92	94	95	90	91
	Pass		–	4	4	4	4	3	3	3	3	3	3
	Pipe size		mm	100	100	125	125	150	150	150	150	200	200
Cooling water	Cooling W.outlet temp		℃	32℃→37.5℃									
	Flow rate		m^3/h	140	167	195	233	260	298	335	372	419	465
	Pressure drop		mh_2O	8.2	8.9	8.2	8.8	7.2	7.5	7.8	8.1	7.3	7.5
			kPa	81	87	81	86	71	73	76	80	72	74
	Pass		–	3+1	3+1	3+1	3+1	2+1	2+1	2+1	2+1	2+1	2+1
	Pipe size		mm	125	125	150	150	200	200	200	200	250	250
Fuel	City Gas	Cooling	Nm^3/h	89.8	107.7	125.7	149.6	167.5	191.5	215.4	239.3	269.3	299.2
		Heating	Nm^3/h	107.8	129.4	150.9	179.7	201.3	230.0	258.8	287.5	323.4	359.4
	Natural gas	Cooling	Nm^3/h	31.0	37.2	43.4	51.7	57.9	66.1	74.4	82.7	93.0	103.3
		Heating	Nm^3/h	37.2	44.7	52.1	62.1	69.5	79.5	89.4	99.3	111.7	124.2
Electric power	Power		V × Hz × ϕ	380 50 × 3									
	Vacuum Pump		kW	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Refrigerant Pump		kW	0.4	0.4	0.4	0.4	0.4	1.8	1.8	1.8	1.8	1.8
	Solution Pump		kW	1.8+1.3	1.8+1.3	1.8+1.3	1.8+1.8	1.8+1.8	3.0+1.8	3.0+1.8	3.0+1.8	3.0+3.0	3.0+3.0
	Spraying Pump		kW	1.3	1.3	1.3	1.3	1.3	1.3	1.8	1.8	2.2	2.2
	Burner Fan		kW	0.75	0.75	1.5	1.5	1.5	2.2	2.2	2.2	2.2	4.0
	Power capacity		kVA	12.1	12.1	13.1	14.2	14.2	18.9	19.9	19.9	22.0	24.1
Dimension	Length		mm	3780	3780	3830	3860	4880	4900	4900	4900	4960	4960
	Width		mm	2090	2170	2190	2400	2400	2435	2550	2580	2650	2750
	Height		mm	2030	2080	2165	2250	2130	2270	2350	2415	2535	2620
Weight	Max. shipping weight		ton	4.9	5.3	5.9	6.3	7.5	8.3	8.9	9.6	10.6	11.2
	Total shipping weight		ton	6.1	6.8	7.5	8.1	9.7	10.8	11.7	12.6	13.9	14.8
	Operating weight		ton	6.6	7.3	8.2	9.0	10.7	11.9	12.9	13.9	15.4	16.5

Note
1. Fouling factor for both chilled water and cooling water is 0.086m^2.k/kW.
2. Minimum chilled water outlet temp. is 5℃, Minimum cooling water inlet temp. is 15℃.
3. Cooling capacity application scope: 20% ~ 100%,Chilled water and cooling water flow rate application scope: 60%~100%;
4. LiBr solution is placed separately, and the weight is included in the total weight.
5. The heating value of Natural Gas is 11000 kcal/Nm^3.

RGD

DIMENSION DRAWING

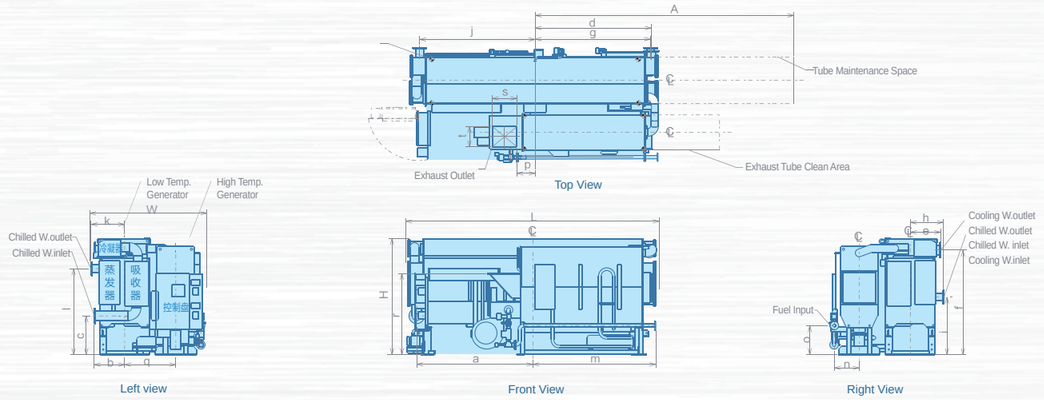
Outline drawing



Unit：mm

Model(RGD)		015	018	021	025
Cooling water inlet	a	1600	1600	1613	1614
	b	456	505	553	586
	c	683	705	707	688
Cooling water outlet	d	1600	1600	1613	1614
	e	496	525	553	583
	f	1789	1826	1904	2017
Chilled water inlet	g	1589	1589	1600	1600
	h	574	593	612	651
	i	1009	1029	1049	1055
Chilled water outlet	j	1589	1589	1600	1600
	k	574	593	612	651
	l	1479	1503	1565	1655
Fuel inlet	m	1743	1893	1742	1782
	n	485	455	451	515
	o	506	506	532	521
Exhaust outlet	p	305	355	355	370
	q	906	923	930	1055
	r	1374	1428	1478	1550
	s	350	450	450	480
	t	310	310	370	370
Total Length	L	3780	3780	3830	3660
Total Width	W	2090	2170	2190	2400
Total Height	H	2030	2080	2165	2250
Tube Maintenance Space	A	4710	4710	4720	4720
Max. shipping weight	t	4.9	5.3	5.9	6.3
Total shipping weight	t	6.1	6.8	7.5	8.1
Operating weight	t	6.6	7.3	8.2	9.0

Outline drawing

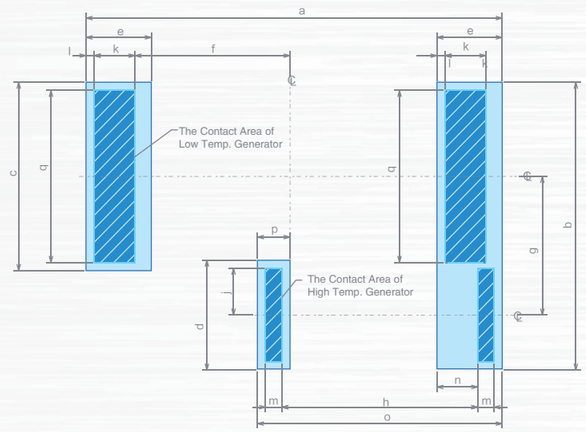


Unit：mm

Model(RGD)		028	032	036	040	045	050
Cooling water inlet	a	2179	2179	2179	2179	2204	2204
	b	506	459	527	611	619	626
	c	569	568	625	662	611	619
Cooling water outlet	d	2139	2139	2139	2139	2164	2164
	e	562	565	610	646	669	688
	f	1873	1969	2072	2134	2251	2323
Chilled water inlet	g	2113	2113	2113	2113	2139	2139
	h	660	674	717	706	718	735
	i	1042	1071	1114	1185	1202	1201
Chilled water outlet	j	2113	2113	2113	2113	2139	2139
	k	660	674	717	706	718	735
	l	1521	1630	1708	1723	1776	1839
Fuel inlet	m	2250	2250	2320	2320	2320	2320
	n	525	545	560	525	550	550
	o	550	500	570	570	570	560
Exhaust outlet	p	305	320	338	364	488	514
	q	1031	1055	1083	1148	1172	1244
	r	1604	1620	1733	1798	1808	1848
	s	450	480	515	568	515	568
	t	430	430	460	460	550	550
Total Length	L	4880	4900	4900	4900	4960	4960
Total Width	W	2400	2435	2550	2580	2650	2750
Total Height	H	2130	2270	2350	2415	2535	2620
Tube Maintenance Space	A	6280	6270	6270	6270	6320	6320
Max. shipping weight	t	7.5	8.3	8.9	9.6	10.6	11.2
Total shipping weight	t	9.7	10.8	11.7	12.6	13.9	14.8
Operating weight	t	10.7	11.9	12.9	13.9	15.4	16.5

FOUNDATION DRAWING

Foundation drawing



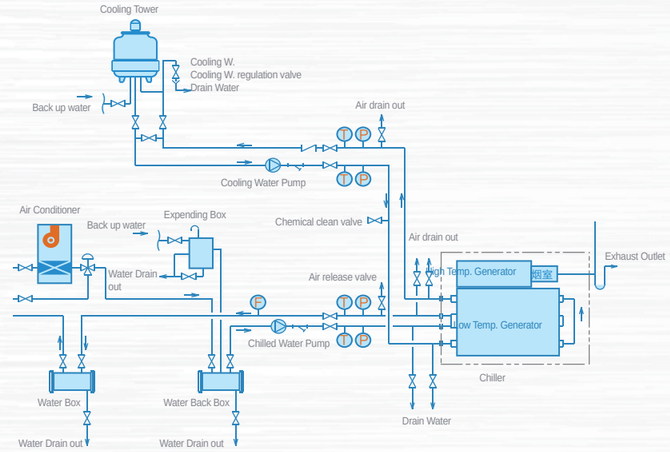
Chiller foundation dimension

Unit：mm

(RGD)	015	018	021	025	028	032	036	040	045	050
a	3200	3200	3200	3200	4180	4180	4180	4180	4180	4180
b	1835	1885	1945	2100	2082	2120	2211	2301	2328	2420
c	995	1045	1090	1150	1132	1160	1230	1280	1287	1325
d	880	880	940	940	970	970	1026	1026	1026	1026
e	350	350	350	350	400	400	400	400	400	400
f	1315	1315	1315	1315	1765	1765	1765	1765	1765	1765
g	906	923	930	1055	1031	1055	1083	1148	1172	1244
h	1356	1356	1365	1356	1756	1756	1756	1756	1906	1906
j	345	345	375	375	390	390	418	418	418	418
k	220	220	220	220	270	270	270	270	270	270
l	65	56	65	65	55	55	55	55	55	55
m	160	160	160	160	160	160	160	160	160	160
n	163	163	163	163	199	198	198	198	198	198
o	1785	1785	1785	1785	2233	2233	2233	2240	2390	2390
p	350	350	350	350	400	400	400	400	400	400
q	805	855	900	960	942	970	1040	1090	1097	1135

SYSTEM
P&I DIAGRAM

P&I Diagram



Sign (P) Pressure sensor
(T) Temp. Sensor
(F) Flow Meter
Filter
Check Valve

Note 01. Within [ ] is the standard supply scope.
02. The diagram shows the typical piping system without standard supply scope.

REFERENCE
VALUE OF WATER QUALITY

Reference value of water quality

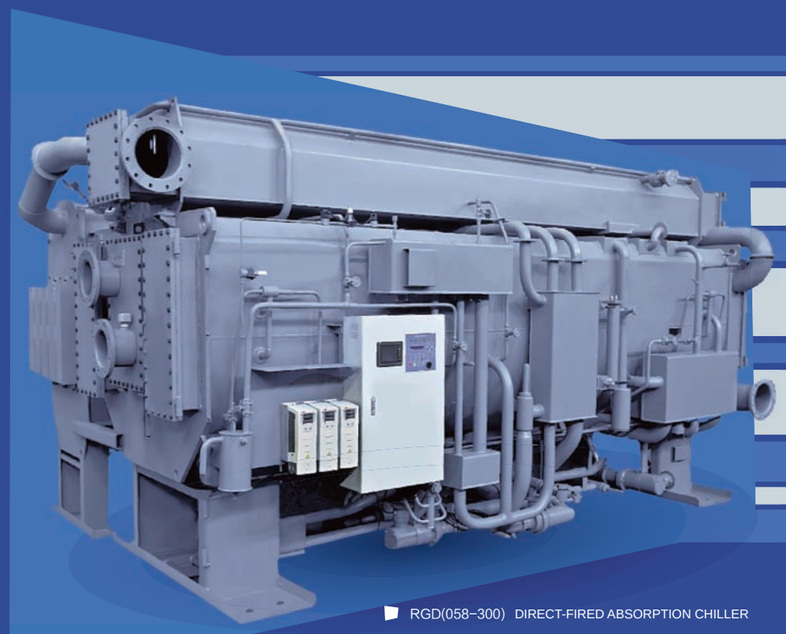
Item	Cooling W. System		Chilled W. system		Tendency	
	Circulating W.	Backup water(20℃以下)	Circulating W.	Backup water	Corrosion	Scaling
PH[25℃]	6.5~8.0	6.0~8.0	6.8~8.0	6.8~8.0	—	—
Conductivity [25℃](μS/cm)	800以下	200以下	400以下	300以下	—	—
Cl^-(mgCl^-/L)	200以下	50以下	50以下	50以下	—	
SO_4^{2-}(mg/L)	200以下	50以下	50以下	50以下	—	
[PH4.8] (mg$CaCO_3$ /L)	100以下	50以下	50以下	50以下		—
(mg$CaCO_3$/L)	200以下	70以下	70以下	70以下		—
(mg$CaCO_3$/L)	150以下	50以下	50以下	50以下		—
(mgSiO_2/L)	50以下	30以下	30以下	30以下		—

01. In order to keep the chiller work effectively in long term, the water quality should be guaranteed. The data below show the reference value for chilled water and cooling water. During daily operating, please manage the water quality within the reference value.
02. The water quality value is based on GB/T18362-2008, just for reference.

RGD (580-3,000RT)

LARGE UNIT

FEATURES



RGD(058-300) DIRECT-FIRED ABSORPTION CHILLER

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Two Stage Evaporation / Absorbtion Design Both the Absorber and Evaportor are consist of low part and high part, which work at different pressure, this special design can reduce the solution to even lower dilution, and the LiBr solution range is enlarged, LiBr solution volume is reduced and less heat loss, the chiller total efficiency is much higher and chiller dimension is reduced.

RGD — Series name

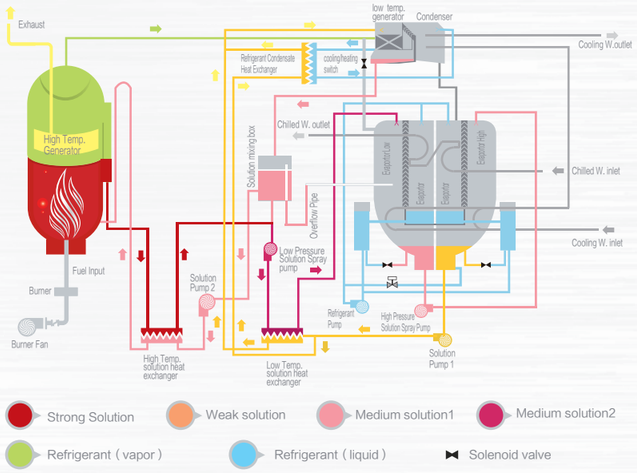
083 — Cooling capacity 830 USRT

□ — H:HTG Enlarge Ⅰ F:HTG Enlarge Ⅱ

RGD

REFRIGERATION
PRINCIPLE

Working Principle

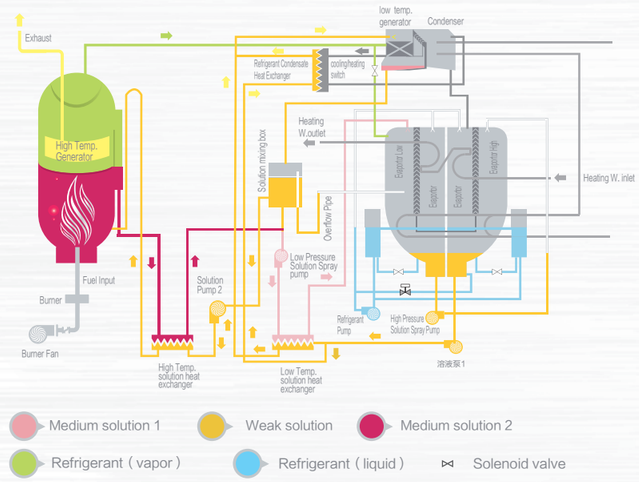


Liquid refrigerant evaporate in the evaporator and cool the chilled water. Then refrigerant vapor goes into absorber, absorbed by strong solution. The strong solution become to weak solution. Solution pump circulates this weak solution back to low temperature generator. In this vessel, weak solution is heated by refrigerant vapor from high temperature generator and evaporate to medium solution. The medium solution goes into high temperature generator and heated by direct fired natural gas. The strong solution is mingled with medium solution in high temperature heat exchanger, and then comes into absorber through low temperature heat exchanger to absorb refrigerant vapor from evaporator. Refrigerant produced in low temperature generator is cooled by cooling water in condenser to return to evaporator.

HEATING THEORY

Heating Theory

Steam vapor from high temp. generator goes into evaporator, heat the hot water and become condensate water.
Refrigerant mix with the mid solution from high temp. generator and become weak solution, then pumped to high temp. generator.



TECHNICAL
DATA SHEET

Performance Data

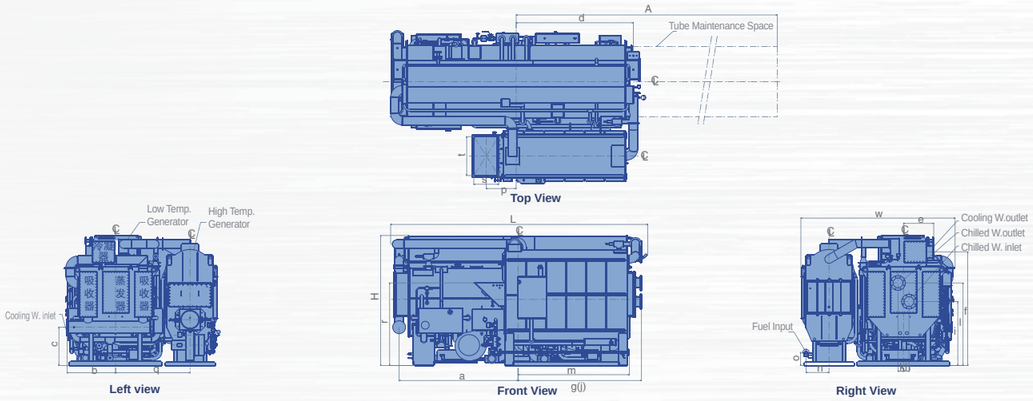
058–200

Model(RGD–)		单位	058	066	083	100	120	135	150	166	182	200
Cooling capacity		USRt	580	661	830	1000	1200	1350	1500	1660	1820	2000
		10^4kcal/h	175	200	251	302	363	408	454	502	550	605
		kW	2040	2325	2919	3517	4220	4748	5276	5838	6401	7034
Heating capacity		10^4kcal/h	140	160	201	242	290	327	363	402	440	484
		kW	1632	1860	2335	2814	3376	3798	4220	4671	5121	5627
Chilled water	Chilled W.outlet temp	℃	冷水12℃→7℃ 温水56℃→60℃									
	Flow rate	m^3/h	350.8	400.0	502.0	604.8	725.8	816.5	907.2	1004.0	1100.7	1209.6
	Pressure drop	mH_2O	6.1	6.2	7.1	7.3	7.1	7.2	7.5	8.3	7.7	9.7
		kPa	60	61	70	72	69	71	73	82	76	96
	Pass	–	2	2	2	2	2	2	2	2	2	2
	Pipe size	mm	200	200	250	250	300	300	300	300	350	350
Cooling water	Cooling W.outlet temp	℃	冷却水32℃→37.5℃									
	Flow rate	m^3/h	539	615	772	930	1116	1256	1395	1544	1693	1860
	Pressure drop	mH_2O	10.0	10.6	9.6	9.7	10.2	9.4	10.0	13.7	10.8	14.3
		kPa	99	104	94	95	100	93	99	135	106	140
	Pass	–	2+1	2+1	2+1	2+1	2+1	2+1	2+1	2+1	2+1	2+1
	Pipe size	mm	250	250	300	350	350	400	400	400	450	450
Fuel	City Gas Cooling	Nm^3/h	347.0	395.5	496.6	598.3	718.0	807.8	897.5	993.2	1089.0	1196.7
	City Gas Heating	Nm^3/h	397.0	452.5	568.2	684.6	821.5	924.1	1026.8	1136.4	1245.9	1369.1
	Natural gas Cooling	Nm^3/h	119.9	136.6	171.6	206.7	248.0	279.0	310.0	343.1	376.2	413.4
	Natural gas Heating	Nm^3/h	137.2	156.3	196.3	236.5	283.8	319.2	354.7	392.6	430.4	473.0
Electric power	Power	V × Hz × ϕ	380 × 50 × 3									
	Electric power	kW	17.2	17.2	20.5	22.9	25.1	30.2	30.2	43.5	43.5	43.5
	Power capacity	kVA	30.1	30.1	37.6	40.5	45.8	56.4	56.4	71.4	75.1	75.1
Dimension	Length	mm	5820	5870	7055	7125	7150	7250	7250	8160	8220	8750
	Width	mm	3315	3555	3690	4150	4500	4750	5050	5050	5755	5755
	Height	mm	2880	3050	3300	3440	3700	4030	4250	4250	4430	4430
Weight	Max. shipping weight	ton	18.6	20.9	26.9	23.0	26.3	24.0	26.4	29.5	33.7	35.6
	Total shipping weight	ton	22.6	25.4	32.5	37.4	44.7	50.0	55.6	65.0	72.4	77.8
	Operating weight	ton	25.1	28.3	36.7	42.6	50.8	57.1	63.2	73.7	82.4	87.1

Note
1. Fouling factor for both chilled water and cooling water is 0.086m^2.k/kW.
2. Minimum chilled water outlet temp. is 5℃, Minimum cooling water inlet temp. is 15℃.
3. Cooling capacity application scope: 20% ~ 100%,Chilled water and cooling water flow rate application scope: 60%~100%;
4. LiBr solution is placed separately, and the weight is included in the total weight.
5. The heating value of Natural Gas is 11000 kcal/Nm^3.

DIMENSION DRAWING

Outline drawing

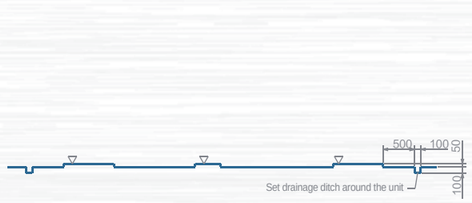


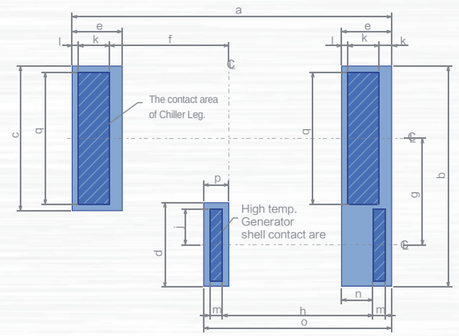
Unit：mm

Model(RGD)		058	066	083	100	120	135	150	166	182	200
Cooling water inlet	a	2714	2714	3271	3319	3319	3338	3338	3793	3793	4043
	b	1077	1115	1158	1250	1285	1340	1416	1416	1524	1524
	c	905	915	925	1000	1050	1100	1230	1230	1240	1240
Cooling water outlet	d	2673	2673	3265	3277	3277	3297	3297	3252	3268	3018
	e	646	690	684	787	787	850	927	927	1090	1090
	f	2516	2638	2910	3025	3220	3550	3758	3758	3882	3882
Chilled water inlet	g	2820	2820	3355	3365	3400	3395	3395	3850	4040	4290
	h	126	123	137	155	164	191	182	182	215	215
	i	1475	1499	1494	1617	1710	1927	2002	2002	2040	2040
Chilled water outlet	j	2820	2820	3355	3365	3400	3395	3395	3850	4040	4290
	k	126	123	137	155	164	191	182	182	215	215
	l	1877	1926	2174	2257	2340	2597	2739	2739	2844	2844
Fuel inlet	m	2540	2540	3085	3085	3085	3085	3085	3060	3050	2649
	n	475	525	600	700	750	800	825	850	860	950
	o	247	300	365	303	355	395	408	400	400	350
Exhaust outlet	p	667	684	886	885	1340	1345	1379	1570	1686	2099
	q	1565	1735	1760	2020	2070	2220	2310	2370	2750	2700
	r	1819	1888	2081	2214	2477	2554	2705	2651	2665	2749
	s	543	568	613	660	720	730	750	750	805	745
	t	764	889	937	1087	1168	1248	1360	1596	1705	1723
Total Length	L	5820	5870	7055	7125	7150	7250	7250	8160	8220	8750
Total Width	W	3315	3555	3690	4150	4500	4750	5050	5050	5755	5755
Total Height	H	2880	3050	3300	3440	3700	4030	4250	4250	4430	4430
Tube Maintenance Space	A	7900	7900	9645	9645	9645	9645	9645	11000	11000	11750
Max. shipping weight	t	18.6	20.9	26.9	23.0	26.3	24.0	26.4	29.5	33.7	35.6
Total shipping weight	t	22.6	25.4	32.5	37.4	44.7	50.0	55.6	65.0	72.4	77.8
Operating weight	t	25.1	28.3	36.7	42.6	50.8	57.1	63.2	73.7	82.4	88.1

FOUNDATION DRAWING

Foundation drawing





Chiller foundation dimension

Unit：mm

Model(RGD)	058	066	083	100	120	135	150	166	182	200
a	5100	5100	6183	6183	6183	6183	6183	6978	6970	7470
b	3225	3565	3670	4090	4285	4530	4765	4885	5450	5400
c	2120	2310	2420	2540	2770	2860	2930	2930	3200	3200
d	1200	1350	1400	1600	1660	1760	1980	2100	2200	2200
e	800	800	807	807	807	807	807	700	700	700
f	1900	1900	2438	2438	2438	2438	2438	2889	2885	3135
g	1565	1735	1760	2020	2070	2220	2310	2370	2750	2700
h	2400	2400	2740	2740	3140	3140	3140	3240	3240	3415
j	500	575	600	700	730	780	890	950	1000	1000
k	500	500	500	500	500	500	500	500	500	500
l	100	100	100	100	100	100	100	100	100	100
m	200	200	380	380	380	380	380	380	380	380
n	500	500	327	327	327	327	327	100	100	100
o	3000	3000	3700	3700	4100	4100	4100	4669	4718	4375
p	400	400	580	580	580	580	580	580	580	580
q	1920	2110	2220	2340	2570	2660	2730	2730	3000	3000

RGD

INSTALLATION
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INSTALLATION INSTRUCTION

Foundation

01. The chiller operating weight should be evenly distributed on the contact surface of foundation. (Please refer to dimension drawing and foundation drawing)
02. Foundation must be fixed with anchor bolts. Anchor bolts and metal gaskets are optional.
03. For the foundation level precision, please refer to the foundation drawing.
04. Foundation should be waterproof, better for chiller maintenance.
05. Set the water drain gouge around the chiller.

Transportation

01. Select right size lifting crane according to the chiller weight.
02. During transportation, the chiller should be lifted up/down horizontally.
03. Please avoid collision with other objects around,
04. Especially the chiller front side, where there are a lot of pipes and meters. Be sure there is no damage or collision.
05. For split lifting, please lift the part which will be installed further to the entrance.

Installation

01. Select well-ventilated place as machine room, ventilation device should be installed in the machine room.
02. Do not select place where is too moist or dusty, that may cause electrical failure for the chiller, so please avoid that.
03. Keep the plant room temperature above 0℃, if less than 0℃, chiller need be special designed;
04. Keep the plant room temperature less than 40℃;
05. Pay attention to the machine room lighting, convenient for regular monitoring and maintenance checking;
06. chiller should be installed at place easy to drain water;
07. The chiller levelness, the shell length direction and width direction, all should be within 1/1000;
08. During installation, use the steel gasket to look for a horizontal vertical degree, if anchor bolts to be installed, the anchor bolts hole should be filled by concrete to fix the anchor bolts.
09. About anchor bolt installation, please refer to foundation drawing.
10. For chiller dimension drawing, the tolerance is +20mm, -10mm;
11. Please refer to the dimension drawing and foundation drawing, and make sure there is enough space around the chiller for maintenance (At least 1m around and 0.2m on the top) and tube drawing ;

INSTALLATION INSTRUCTION

Piping works

1. Please refer to the outline drawing for the cooling/chilled water inlet pipe direction and size. For the flange connection specifications, please refer to the dimension drawing and specification.
2. Cooling water piping between absorber and condenser will be installed in Ebara factory.
3. For chilled water pipe direction, please refer to outline drawing.
4. During designing the installation position of chilled/heating water pump, cooling water pump, expansion tank, please consider the precondition of static water pressure and pump water head, the pressure to both chiller/heating water and cooling water cannot be over the Max. Working pressure.
5. To keep the water flowrate stable, each chiller should be installed with specialized chilled water pump and cooling water pump.
6. A 10 mesh strainer is requested for both chilled water and cooling water inlet.
7. Please install pressure gages and thermometers at the chilled water inlet and cooling water inlet. And, in order to ensure the control stability, the chilled circle water storage volume should be at least 5 times than the volume of one minute circulation.
8. For chilled water and cooling water piping, please set vent valve above absorption chiller water chamber, set drain valve at lowest point.
9. There are air release connection plinths in the upper of evaporator and condenser water box (Rc3/4 internal thread). Install the on/off valve to use it, and pipe it to the water drain gouge.
10. There are water release connection plinths under the evaporator and condenser water box(Rc3/4 internal thread). Install the on/off valve to use it, and pipe it to the water drain gouge.
11. If the cooling water temp. is below 15℃, please control the cooling water temp. E.g., use the cooling tower fan on-off to control cooling water temp., please use the cooling tower fan interlock function through chiller control panel.
12. Please install the cooling water drainage regulation valve at the cooling tower inlet piping.
13. Prepare water source for tube cleaning.
14. No load-bearing on the chiller water flange connections, install support frame under them.
15. During chiller heating operation in winter, please be noticed that the water inside the chiller tube can’t be frozen during the chiller stop period, especially the cooling water. Please be sure there is no water residence inside the chiller during stop period, please drain the water from the water side box (absorber water box) drain pipe.
16. During the chiller heating operation, please do the heat insulation for the chiller absorber connection flange since the temp. may reach to more than 80℃.
17. Install soft connecting pipe for the water connection point.
18. When testing the water pressure of chilled/heating water and cooling water, please make sure the testing pressure is less than the stamped testing pressure on the water box flange, furthermore, if use pneumatic pressure test at that time, it will be very dangerous if the broken fragment fly around.

RGD

INSTALLATION
INSTRUCTION

INSTALLATION INSTRUCTION

Natural Gas, Exhaust & Piping

01. For the Natural gas piping of each chiller, please install natural gas flow meter, which is easy for operation and maintenance.
02. For the connection flange of exhaust outlet, please refer to the chiller dimension drawing, and it’s the customer’s duty to prepare the connection flange. For the fix bolts, please use the full thread bolts.
03. The customer’s exhaust outlet pipe should be bigger than the chiller exhaust drain pipe, and be sure there is no sharp bending of the exhaust drain pipe to increase the exhaust back pressure.
04. It’s recommend that the exhaust drain pipe at job site should be installed horizontally, and bending pipe as less as possible. The static pressure at exhaust outlet nozzle should be around 0 mm W.C. The back pressure at exhaust outlet nozzle should be at least 0.049 kPa (5mm W.C.). Please install exhaust ventilation regulation valve if necessary.
05. The exhaust piping at machine room should be at around 1/18 ascending degree.
06. The exhaust piping at machine room should be only for the chiller. Please install on/off valve before the chiller exhaust goes into the common pipe.
07. The exhaust pipe should be SS tube (1Cr18Ni9Ti or better), galvanized steel pipe, and thickness of more than 4mm.
08. At the bottom of the exhaust pipe, please install the exhaust release hole, and be sure that there will be no condensate flow back to the exhaust connection flange. And the exhaust pipe installed at jobsite should be designed easy for cleaning.
09. Please install the condensate water drainpipe at the bottom of the exhaust outlet chamber (Rc3/4 inner thread). And install on/off valve to control it.
10. For the exhaust pipe which will goes through the wall, please use heat insulation and fire resistance materials.
11. Please make heat insulation for the exhaust pipe at machine room, the insulation materials should be non-flammable.
12. Please do the support exhaust pipe by steel frame, don’t lay the exhaust pipe on the top of the chiller. Please consider the exhaust pipe thermal expension.
13. The exhaust outlet nozzle should be more than 1m far away from the house and more than 0.6 m higher above the building.
14. The exhaust outlet nozzle should be far away from the cooling tower. And the outlet nozzle should be designed to avoid rainwater goes into the pipe.
15. Please install the lighting rod on the top of the exhaust outlet nozzle



JOB
REFERENCE

Job References