

Electrical chiller product

RTGC-15A

<http://www.ers.ebara.com/en/>



EBARA-ALWAYS BENEFITING THE EARTH

Absorption chiller product
Electrical chiller product
Industrial blower product
Cooling tower product

RTGC

CENTRIFUGAL CHILLERS (HEAT PUMP)

Absorption chiller product
Electrical chiller product
Industrial blower product
Cooling tower product



EBARA REFRIGERATION EQUIPMENT & SYSTEMS CO.,LTD.

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EBARA REFRIGERATION EQUIPMENT & SYSTEMS CO.,LTD.

Ebara- A International famous brand
for Superior Environment
Friendly Products

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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.


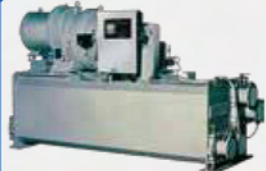


Yantai EBARA Company Profile

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 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.

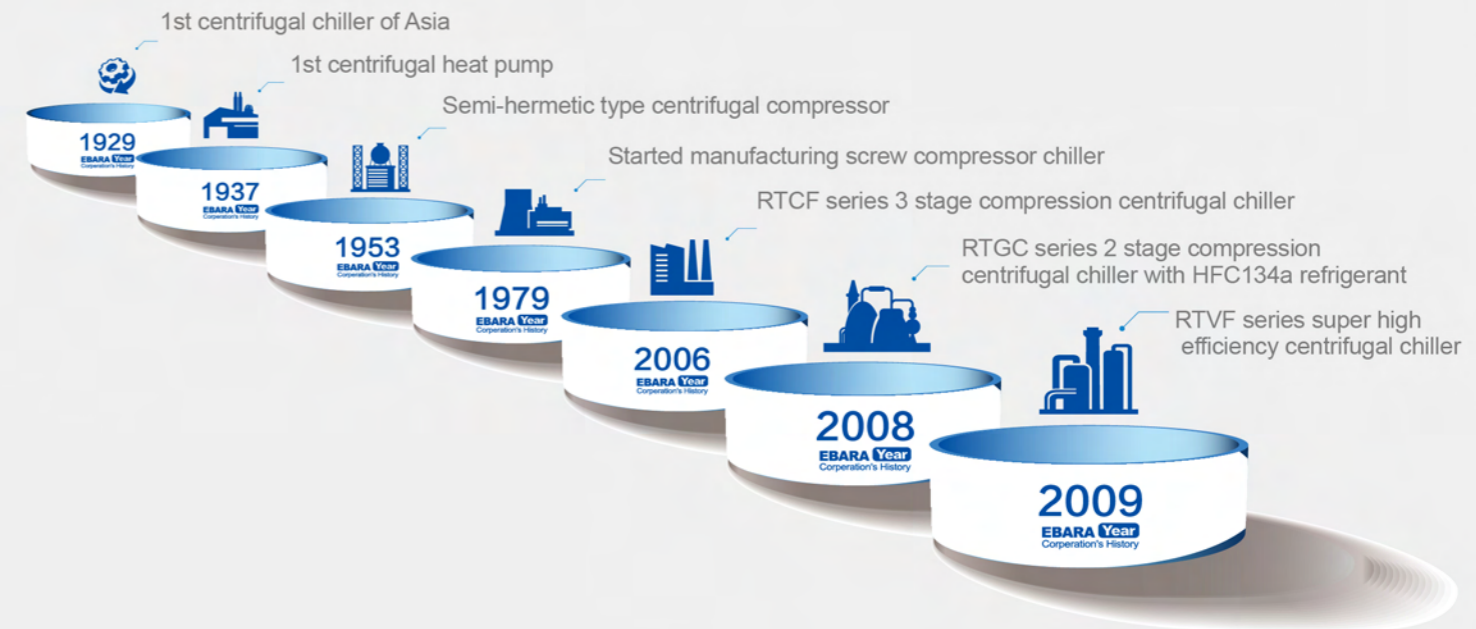


PRODUCT DEVELOPMENT MILE STONES

Product Development Mile Stones

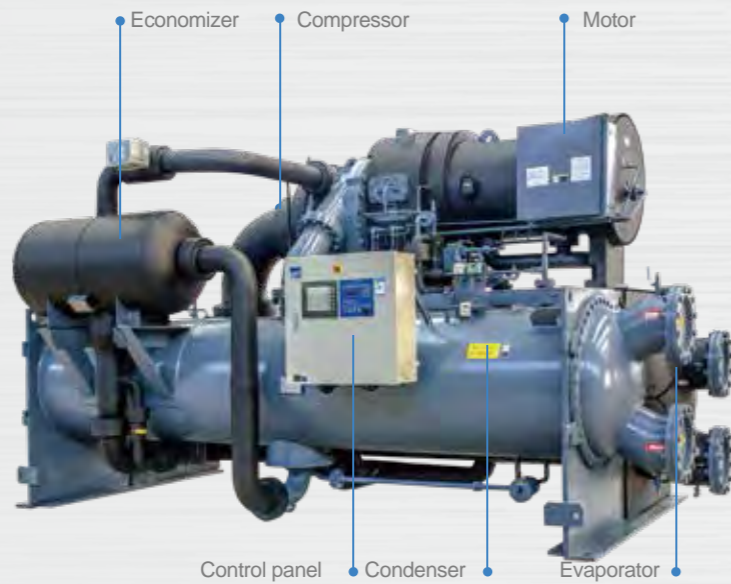
 <p>1929 Start producing centrifugal chiller in 1929.</p>	 <p>1953 Semi-hermetic type centrifugal compressor launched in 1953.</p>
 <p>2008 RTGC series 2 stage compression centrifugal chiller with HFC134a refrigerant.</p>	 <p>2009 RTVF series super high efficiency centrifugal chiller with HFC245fa refrigerant</p>

Product Development History



RTGC PRODUCT INTRODUCTION

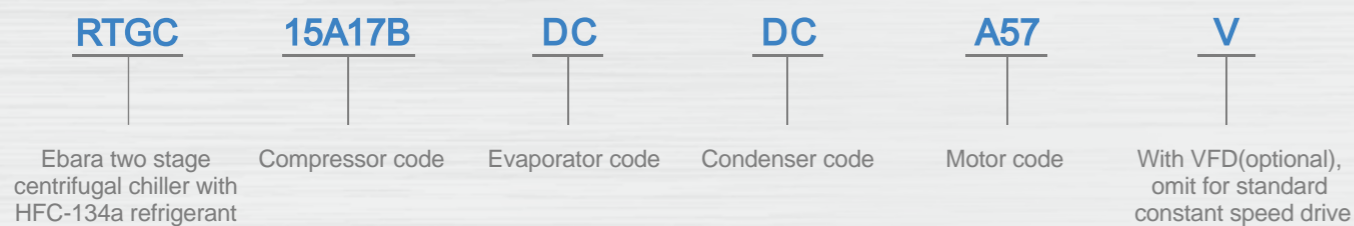
Product Introduce



Ebara centrifugal chiller consists of centrifugal compressor, condenser, evaporator, economizer, throttling device and control panel etc.

After cooling building load, chilled water temperature increases and then returns back to chiller evaporator. In evaporator, refrigerant vaporizes to absorb heat from returned chilled water and cool it to the set point temperature. Vaporized refrigerant becomes to gas and sucked by compressor. After first stage compressing, the other flow of refrigerant gas from economizer joins it then goes to second stage of compressing. After discharged from the second impeller, the gas gets very high velocity and goes into the volute where its kinetic energy converts to static energy, then goes into condenser. In condenser, the cooling water from cooling tower cools and condense the refrigerant gas to liquid. And the liquid refrigerant goes to economizer and throttle then goes to evaporator to complete the refrigerant cycle.

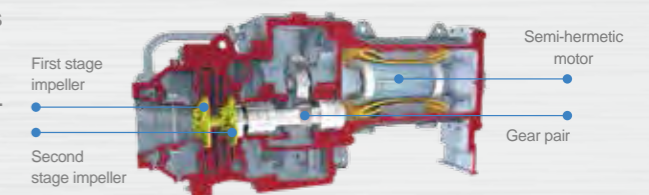
Nomenclature



Product Features

Extreme high efficiency at both full load and partial load condition

- Two stage compressing cooperated with economizer increases refrigerant cycle efficiency by 4% in full load condition and 6% in part load condition compared with single stage compression.
- Maximum efficiency at AHRI condition is 0.52kw/ton.
- Apply rolling bearing, less friction loss and longer working life.
- Equipped with economizer to boost chiller efficiency.
- Enhanced fin tubes applied evaporator and condenser to increase chiller efficiency.

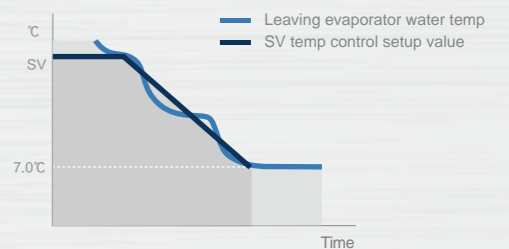
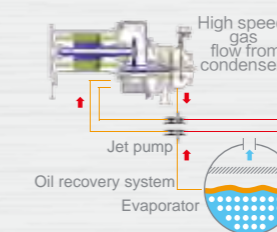
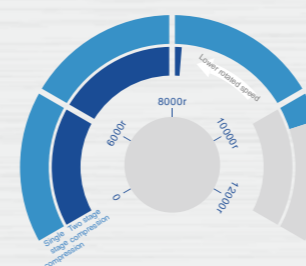


6 unique technologies to guarantee chiller stability

2,000RPM less than single stage, makes chiller noise level reduced and enhances its reliability

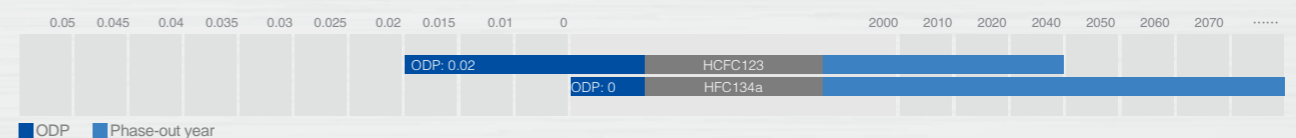
Gear box is integrated with oil sump, plus emergency oil reservoir in compressor top ensures lubrication even if power loss happens

Patent SV temp control technology ensures chilled water temp pull down smoothly & accurately during startup period



Environmental-friendly refrigerant

- ODP (Ozone Depression Potential) value of HCFC123 is 0.02, thus it will phase out before 2020 according to <Montreal Protocol>.
- ODP value of HCFC134a is 0, and there is no phase out schedule.



RTGC PRODUCT INTRODUCTION

Chiller Control System

Control panels

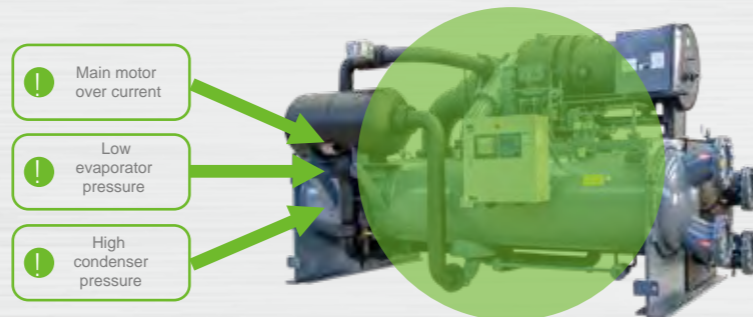
RTGC series centrifugal chiller applies Ebara ERICS control system, a 10 inch colorful touch screen with a LED interface offers 100% redundancy to ensure chiller reliability.



- 01. Touch screen displays all necessary data including cooling/chilled water temperature & motor current etc.
- 02. Chiller can be set to work at 2 working conditions.
- 03. Pre-alarm function will work and inform the operator before chiller trip.
- 04. Quick restart function enables chiller auto restart when power failure happens.
Chiller can re-start automatically if power loss time is less than 10 minutes.
- 05. Remote temperature reset function allows chilled water temperature reset by BMS system.

Trip pre-rectify

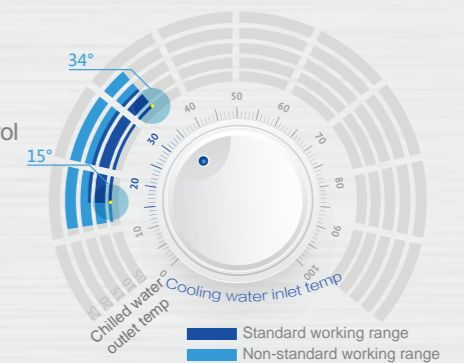
When controller detects abnormality of evaporator/condenser pressure or compressor amps, it will force the chiller unload so as to avoid chiller trip and maintain the cooling system stable.



Technical features

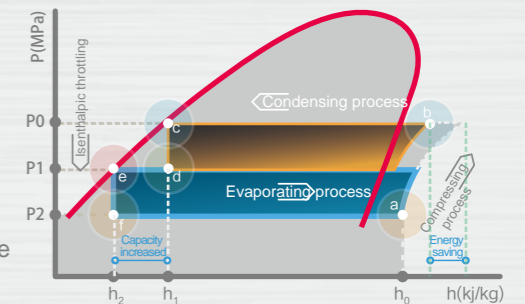
Widely application

01. Beside air-conditioning, two stage compressor can be applied in thermal ice storage and heat pump applications
02. Stepless control of inlet guide vanes cooperated with Ebara patent ECO control system extends chiller working range
03. Low voltage(380V~460V), medium voltage(3~6.6KV) and high voltage (10~11kV), 50/60Hz motors are available for different countries.



Two stage compression plus economizer design

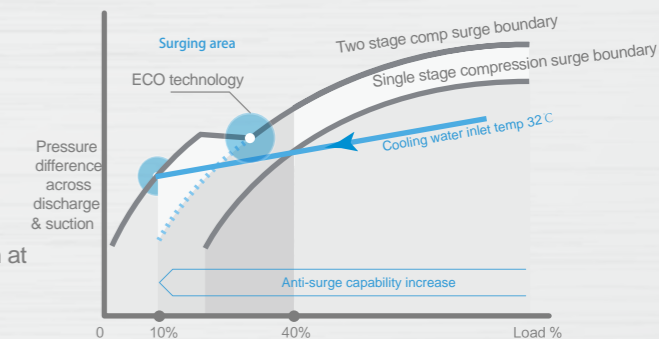
01. Flash gas in economizer goes back to compressor, mixes with and cools the discharge gas from first stage impeller then gets compressed in second stage impeller. Compared with single stage, the efficiency gets 5~8% improved.
02. Two stage compression refrigerant cycle—Throttling process: High pressure liquid go through 1st stage throttling device, its pressure reduces and small amount liquid flashes. The flashed gas goes back to 2nd stage impeller. Other refrigerant liquid go to 2nd stage throttling device then arrive at evaporator.
03. Compared with conventional single stage compression, two stage compression increase cooling capacity and reduce the power consumption. Thus, its efficiency is higher than single stage.



Advantages of two stage compressing VS single stage

Surge Prevention

01. Hot gas bypass is a conventional solution but not recommended because of low energy efficiency when it works.
02. Two stage compression has na
03. With Ebara special ECO control technology, the working range is extended for further. Chiller is able to unload to 10% of full load even at constant entering condenser temperature condition.

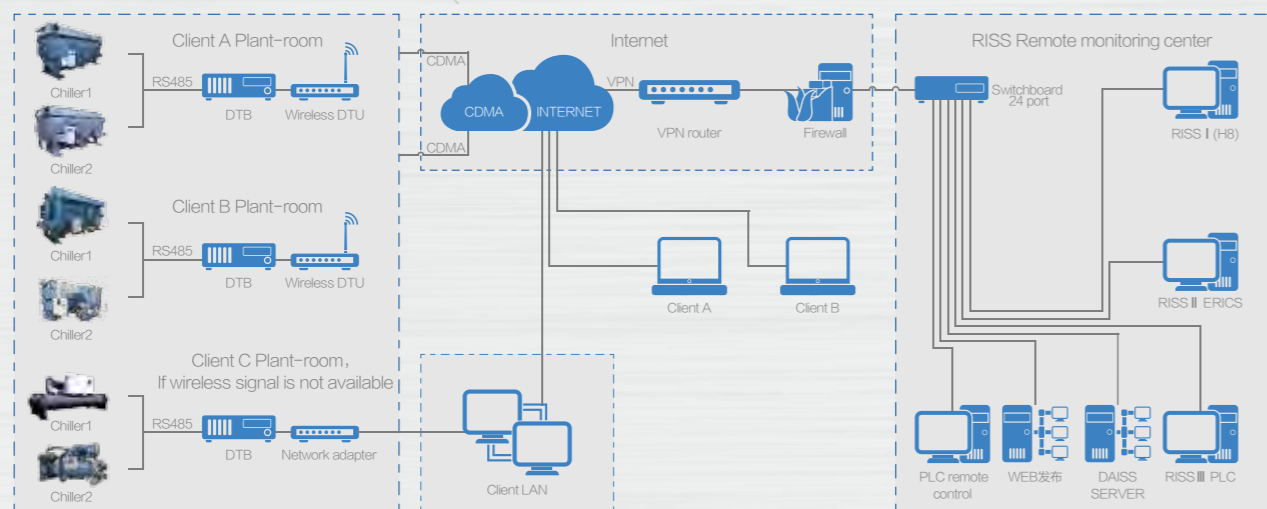


RTGC PRODUCT INTRODUCTION

TECHNOLOGY APPLICATION

Remote monitoring

Remote monitoring system



RISS remote monitoring system

Ebara engineers monitor & diagnose chiller/heat-pump operating status in control center of our head quarter.

And provide below service to clients:

- Preventative maintenance & service management
- Scheduled maintenance & service
- Emergency calling center
- Quick response for emergent chiller trip

Lines of Communication

There are 2 types of RISS communication line:

Type 1 is CDMA 3G net. Ebara apply the special CDMA net to ensure stable & reliable communication ;

Type 2 is internet connection. Client need to provide internet interface and allow Ebara chiller in site to access the internet.

Please contact Ebara local sales office for details.

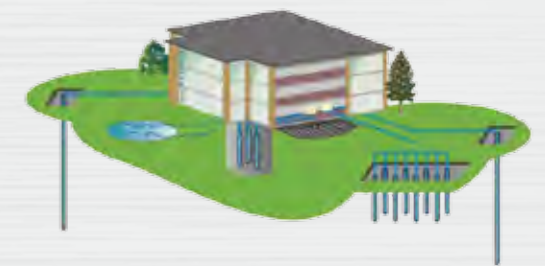
Special Applications(Optional)

Heat pump system working

The heat pump unit extracts heat from low level energy source like underground water, river water & urban sewage. Then convey this energy to building for heating/cooling and domestic hot water.

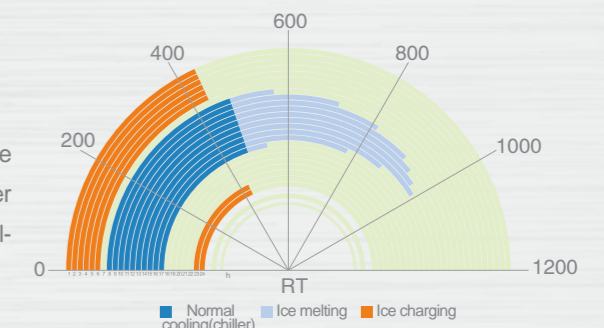
Heat pump system features:

01. Multi-functions: To provide cooling/heating and domestic hot water by one chiller/heat-pump unit.
02. Energy efficiency: Utilizing low level recyclable energy as the heat source.
03. Stability: Use geothermal heat as heat source which is stable and it will not be affected by climate.



Thermal ice storage

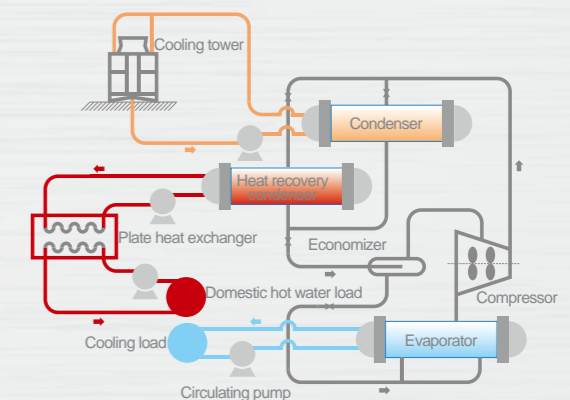
Utilize electric tariffs policy, run the chillers during off-peak time to charge ice in the ice tank. During peak time, melt the ice to reduce running chiller quantities or even stop all chillers. Such application reduces chiller installation capacity as well as running cost.



Condensing heat recovery

Ebara centrifugal chiller/heat-pump can recover partial or full condensing heat then use it for heating such as supplying domestic hot water etc. This application reduces heat rejection to ambient and increase system energy efficiency.

The figure in right shows full heat recovery application, of which the chiller/heat-pump recovers 100% of its condensing heat and used for domestic hot water heating.



RTGC LECTOTYPE CASE



Performance data (Air-conditioning)

380V/3P/50Hz

Model	Performance data			Amps		Evaporator			Condenser			Overall dimension					Refrigerant	
	Cooling capacity USRT	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	Height mm	Shipping weight kg	Operating weight kg	Charge kg	
RTGC07A11CB2B2A51	500	1758	309	5.70	550	1306	302	65	250	358	51	250	4570	2550	2470	10800	12700	700
RTGC07A31CB2B2A51	550	1934	339	5.71	603	1306	332	77	250	394	61	250	4570	2550	2470	10800	12700	700
RTGC07A51CB3B3A51	600	2110	370	5.70	659	1306	362	77	250	430	63	250	4570	2550	2470	10900	12800	700
RTGC07A61CB4B4A52	650	2285	400	5.71	771	1550	392	74	250	465	64	250	4570	2550	2470	11000	12900	750
RTGC07A71CC4C4A52	700	2461	428	5.75	762	1550	422	92	250	501	79	250	4970	2550	2470	11300	13500	800
RTGC07A73CC7C6A52	750	2637	462	5.71	822	1550	453	72	300	537	72	300	5000	2900	2850	13400	15800	800
RTGC10A33CC6C6A54	800	2813	491	5.74	870	1828	483	95	300	572	80	300	5000	2900	2850	14800	17200	900
RTGC10A43CC7C7A54	850	2989	520	5.75	922	1828	513	89	300	608	77	300	5000	2900	2850	15100	17500	900
RTGC10A53CC7C7A55	900	3164	553	5.72	982	2146	543	98	300	644	85	300	5000	2900	2850	15100	17500	900
RTGC10A63CC8C8A55	950	3340	582	5.74	1034	2146	573	92	300	680	82	300	5000	2900	2850	15300	17700	900
RTGC10A73CC9C8A55	1000	3516	615	5.72	1092	2146	603	92	300	716	90	300	5000	2900	2850	15400	17800	1000

- Note** 01. Above data based on chilled water temp 12/7°C and cooling water temp 32/37°C.
 02. Standard evaporator and condenser has 2 pass, water side maximum working pressure is 1.0MPa.
 03. Motor start amps will vary according to different working condition.
 04. Above models are only partial of our supply scope, for other models or working conditions, please contact Ebara local office or distributors.



Performance data (Air-conditioning)

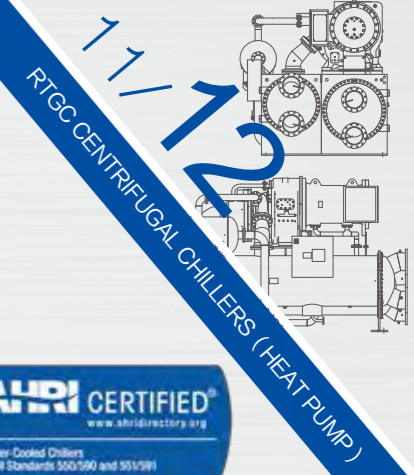
10kV/3P/50Hz

Model	Performance data			Amps		Evaporator			Condenser			Overall dimension					Refrigerant	
	Cooling capacity USRT	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	Height mm	Shipping weight kg	Operating weight kg	Charge kg	
RTGC10A75CCBCCD56	1100	3868	677	5.71	46	307	664	95	350	788	66	400	5100	3280	3080	19300	23600	1000
RTGC15A33CCCBBD57	1200	4219	727	5.80	49	339	724	97	350	857	88	400	5100	3280	3240	19200	25200	1350
RTGC15A53CCDCCD57	1300	4571	793	5.77	53	339	785	98	350	929	89	400	5100	3280	3240	21300	25500	1350
RTGC15A63CCECCD58	1400	4922	854	5.77	57	400	845	100	350	1001	89	400	5100	3280	3240	21600	25800	1400
RTGC15A73CCECCD58	1500	5274	917	5.75	61	400	905	113	350	1073	101	400	5100	3280	3240	21600	25800	1450
RTGC15A75CDEDED59	1600	5626	981	5.73	65	477	966	137	350	1145	109	400	5500	3280	3240	22200	26500	1500

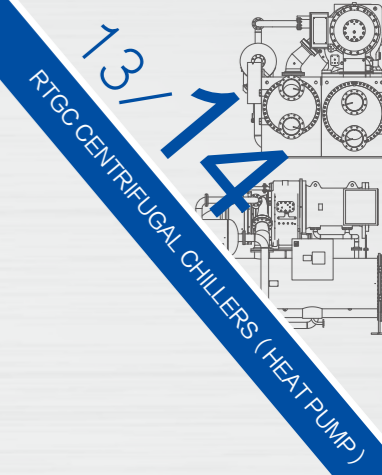
10kV/3P/50Hz

Model	Performance data			Amps		Evaporator			Condenser			Overall dimension					Refrigerant	
	Cooling capacity USRT	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	Height mm	Shipping weight kg	Operating weight kg	Charge kg	
RTGC20A11CDGDGD5A	1700	5979	954	6.27	63	270	1026	118	400	1201	91	450	5700	3780	3560	28100	33900	1650
RTGC20A31CDHDHD5A	1800	6331	1009	6.28	67	270	1087	119	400	1272	91	450	5700	3780	3560	28300	34150	1700
RTGC20A41CDJJD5A	1900	6682	1063	6.29	71	270	1147	119	400	1342	92	450	5700	3780	3560	28500	34400	1750
RTGC20A43CDKDKD5B	2000	7034	1126	6.24	75	322	1207	123	400	1414	96	450	5700	3780	3560	28700	34650	1800
RTGC20A51CDLDDL5B	2100	7386	1172	6.30	78	322	1268	121	450	1483	96	450	5800	4120	3820	28900	34900	1900
RTGC20A53CDMDMD5B	2200	7737	1237	6.26	82	322	1328	121	450	1555	97	450	5800	4120	3820	29100	35050	1950
RTGC20A61CDNDND5B	2300	8089	1276	6.34	85	322	1388	121	450	1623	97	450	5800	4120	3820	29300	35300	2000
RTGC20A71CDPDPD5C	2400	8441	1335	6.32	89	385	1449	121	450	1694	97	450	5800	4120	3820	29500	35550	2050
RTGC20A73CDQDQD5C	2500	8793	1414	6.22	94	385	1509	123	450	1769	98	450	5800	4120	3820	29700	35800	2100

- Note** 01. Above data based on chilled water temp 12/7°C and cooling water temp 32/37°C.
 02. Standard evaporator and condenser has 2 pass, water side maximum working pressure is 1.0MPa.
 03. Motor start amps will vary according to different working condition.
 04. Above models are only partial of our supply scope, for other models or working conditions, please contact Ebara local office or distributors.



RTGC LECTOTYPE CASE



Performance data (Heat-pump)

380V/3P/50Hz

Model	Working condition	Performance data				Amps		Evaporator			Condenser			Overall dimension					Refrigerant
		Cooling capacity USRt	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	High mm	Shipping weight kg	Operating weight kg	Charge kg	
																			USRt
RTGC07A11HB1B0A51	Cooling	537	1890	312	6.06	556	1306	324	87	250	238	34	250	4570	2550	2470	10500	12300	700
	Heating	530	1866	331	5.64	590		238	50	250	324	56	250						
RTGC07A31HB3B0A51	Cooling	614	2160	355	6.09	632	1306	371	80	250	272	43	250	4570	2550	2470	10700	12500	700
	Heating	605	2128	378	5.63	674		272	46	250	370	71	250						
RTGC07A61HB4B2A52	Cooling	711	2500	409	6.11	728	1550	429	86	250	315	42	250	4570	2550	2470	11000	12800	800
	Heating	702	2468	438	5.64	778		315	49	250	429	68	250						
RTGC07A71HB6B5A53	Cooling	800	2813	468	6.01	834	1836	483	86	300	355	38	300	4600	2900	2850	12800	15200	900
	Heating	790	2778	488	5.69	869		355	50	300	483	61	300						
RTGC10A33HB7B5A54	Cooling	900	3164	521	6.08	924	1828	543	90	300	398	46	300	4600	2900	2830	12900	15300	900
	Heating	876	3082	547	5.63	971		398	51	300	536	74	300						
RTGC10A53HB8B6A55	Cooling	1000	3516	576	6.10	1024	2146	603	92	300	442	48	300	4600	2900	2830	13100	15500	1000
	Heating	987	3470	615	5.64	1092		442	52	300	603	78	300						

10kV/3P/50Hz

Model	Working condition	Performance data				Amps		Evaporator			Condenser			Overall dimension					Refrigerant
		Cooling capacity USRt	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	High mm	Shipping weight kg	Operating weight kg	Charge kg	
																			USRt
RTGC10A63HC9C7D56	Cooling	1100	3868	637	6.07	42	307	664	109	350	487	53	400	5000	2900	2830	15300	18100	1000
	Heating	1087	3822	669	5.71	45		487	62	350	664	87	400						
RTGC15A23HCCCAD57	Cooling	1223	4300	709	6.07	47	339	738	100	350	541	46	400	5100	3280	3240	20800	25100	1350
	Heating	1208	4248	743	5.72	50		541	57	350	738	76	400						
RTGC15A33HCDCBD57	Cooling	1300	4571	750	6.10	50	339	785	98	350	575	45	400	5100	3280	3240	21000	25300	1350
	Heating	1283	4512	787	5.73	53		575	56	350	784	72	400						
RTGC15A41HCECBD58	Cooling	1400	4923	791	6.23	53	400	845	100	350	618	51	400	5100	3280	3240	21100	25400	1400
	Heating	1361	4865	835	5.83	56		618	57	350	845	83	400						

Note 01. Above data based on chilled water temp 12/7 °C and cooling water temp 32/37 °C ;

Hot source water inlet temp is 15 °C ,Hot water inlet/out temp is 40/45 °C ;

02. Standard evaporator and condenser has 2 pass, water side maximum working pressure is 1.0MPa.

03. Motor start amps will vary according to different working condition.

04. Above models are only partial of our supply scope, for other models or working conditions, please contact Ebara local office or distributors.

Performance data (Heat-pump)

10kV/3P/50Hz

Model	Working condition	Performance data				Amps		Evaporator			Condenser			Overall dimension					Refrigerant
		Cooling capacity USRt	Power input kW	COP kW/kW	Rated load amps A	Start amps A	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Flow rate m³/h	Pressure drop kPa	Pipe dia mm	Length mm	Width mm	Height mm	Shipping weight kg	Operating weight kg	Charge kg	
																			USRt
RTGC15A41HCECDD58	Cooling	1500	5274	862	6.11	58	400	905	113	350	663	44	400	5100	3280	3240	21300	25600	1450
	Heating	1481	5209	891	5.85	59		663	64	350	905	72	400						
RTGC15A61HDFDFD58	Cooling	1600	5627	887	6.35	59	400	966	120	400	704	40	450	5700	3780	3500	26400	32200	1500
	Heating	1579	5554	939	5.91	63		704	68	400	965	66	450						
RTGC15A71HDGDFD59	Cooling	1700	5979	950	6.29	63	477	1026	118	400	749	45	450	5700	3780	3500	26500	32300	1550
	Heating	1679	5906	1001	5.90	67		749	67	400	1026	73	450						
RTGC15A71HDHDFD59	Cooling	1800	6331	1043	6.07	69	477	1087	119	400	797	50	450	5700	3780	3500	26600	32400	1600
	Heating	1777	6250	1060	5.90	71		797	68	400	1086	81	450						
RTGC20A11HDHDFD5A	Cooling	1900	6682	1024	6.53	68	270	1147	130	400	833	54	450	5700	3780	3560	28000	33850	1750
	Heating	1876	6598	1078	6.12	72		833	73	400	1147	89	450						
RTGC20A21HDJDFD5B	Cooling	2000	7034	1077	6.53	72	322	1207	131	400	877	59	450	5700	3780	3560	28100	33950	1800
	Heating	1976	6948	1138	6.11	76		877	74	400	1207	98	450						
RTGC20A31HDKDGD5B	Cooling	2100	7386	1127	6.55	75	322	1268	134	400	920	58	450	5700	3780	3560	28300	34150	1900
	Heating	2074	7294	1194	6.11	80		920	75	400	1268	96	450						
RTGC20A41HDLDL5B	Cooling	2200	7737	1166	6.64	78	322	1328	131	450	962	46	450	5800	4120	3820	28900	34900	1950
	Heating	2172	7638	1243	6.14	83		962	73	450	1327	76	450						
RTGC20A51HDMDL5B	Cooling	2300	8089	1219	6.63	81	322	1388	130	450	1006	50	450	5800	4120	3820	29000	35000	2000
	Heating	2272	7989	1303	6.13	87		1006	73	450	1388	83	450						
RTGC20A61HDNDLD5C	Cooling	2400	8441	1278	6.60	85	385	1449	130	450	1051	54	450	5800	4120	3820	29100	35100	2050
	Heating	2370	8336	1361	6.12	90		1051	73	450	1449	89	450						
RTGC20A61HDPDL5C	Cooling	2500	8793	1339	6.57	89	385	1509	129	450	1095	58	450	5800	4120	3820	29200	35200	2100
	Heating	2470	8686	1408	6.17	93		1095	73	450	1509	96	450						
RTGC20A71HDQDL5C	Cooling	2600	9144	1399	6.54	93	385	1569	132	450	1140	62	450	5800	4120	3820	29300	35300	2150
	Heating	2568	9030	1480	6.10	98		1140	74	450	1569	103	450						
RTGC20A71HDQDMD5C	Cooling	2700	9496	1468	6.47	98	385	1630	141	450	1185	61	450	5800	4120	3820	29400	35400	2200
	Heating	2665	9374	1519	6.17	101		1185	80	450	1629	101	450						

Note 01. Above data based on chilled water temp 12/7 °C and cooling water temp 32/37 °C ;

Hot source water inlet temp is 15 °C ,Hot water inlet/out temp is 40/45 °C ;

02. Standard evaporator and condenser has 2 pass, water side maximum working pressure is 1.0MPa.

03. Motor start amps will vary according to different working condition.

04. Above models are only partial of our supply scope, for other models or working conditions, please contact Ebara local office or distributors.

RTGC LECTOTYPE CASE

RTGC OUTLINE DIMENSION

Performance data (Ice storage)

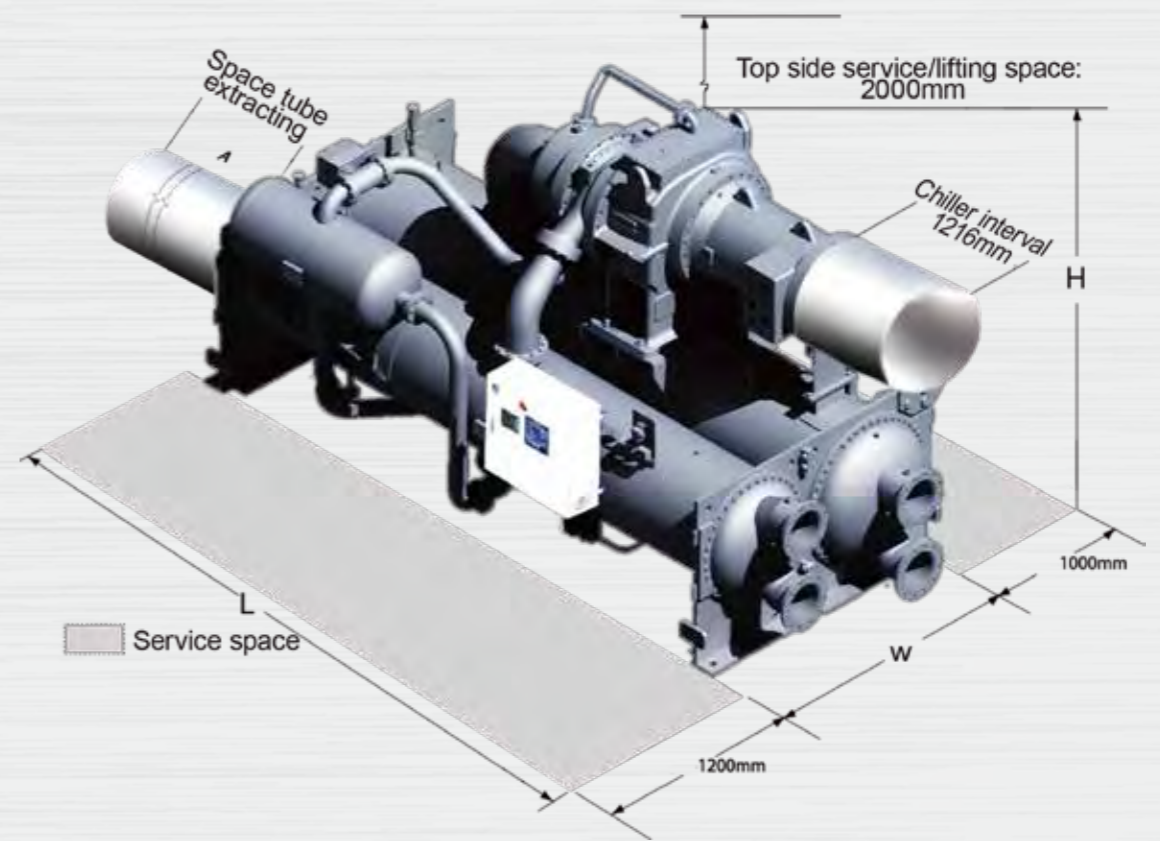
Overall dimension

380V/3P/50Hz

Model	Working condition	Performance data			Amps		Evaporator			Condenser			Overall dimension				Refrigerant		
		Cooling capacity	Power input	COP	Rated load	Start amps	Flow rate	Pressure drop	Pipe dia	Flow rate	Pressure drop	Pipe dia	Length	Width	Height	Shipping weight		Operating weight	Charge
RTGC07A27BA2A3A51	Ice storage	400	1407	347	4.05	619	1306	322	95	250	434	59	250	4170	2550	2470	10500	12400	700
RTGC07A67BA5A6A52	Ice storage	500	1759	431	4.08	767	1550	402	95	300	542	61	300	4200	2900	2850	12500	14900	700
RTGC10A29BA6A8A54	Ice storage	600	2110	519	4.07	921	1828	483	112	300	650	64	300	4200	2900	2830	14300	16700	900
RTGC10A59BA9A9A55	Ice storage	700	2462	606	4.06	1076	2146	563	97	300	759	74	300	4200	2900	2830	14700	16700	950

10kV/3P/50Hz

Model	Working condition	Performance data			Amps		Evaporator			Condenser			Overall dimension				Refrigerant		
		Cooling capacity	Power input	COP	Rated load	Start amps	Flow rate	Pressure drop	Pipe dia	Flow rate	Pressure drop	Pipe dia	Length	Width	Height	Shipping weight		Operating weight	Charge
RTGC15A17BBBBD57	Ice storage	800	2814	685	4.11	46	339	644	119	350	865	83	400	4700	3280	3240	20300	24600	1000
RTGC15A37BBCBCD57	Ice storage	900	3165	763	4.15	51	339	724	127	350	972	89	400	4700	3280	3240	20500	24800	1000
RTGC15A57BBEBED58	Ice storage	1000	3517	842	4.18	56	400	804	121	350	1078	84	400	4700	3280	3240	20900	25200	1350
RTGC15A67BCECED58	Ice storage	1100	3869	923	4.19	62	400	885	156	350	1185	109	400	5100	3280	3240	21600	25900	1350
RTGC15A77BDGDGD59	Ice storage	1200	4220	994	4.24	66	477	965	154	400	1290	104	450	5700	3780	3500	26600	32400	1400
RTGC15A79BDKDKD59	Ice storage	1300	4572	1109	4.13	74	477	1046	139	400	1405	96	450	5700	3780	3500	26900	32700	1400
RTGC20A43BDJDKD5A	Ice storage	1400	4924	1073	4.59	71	270	1126	167	400	1483	106	450	5700	3780	3560	28600	34500	1450
RTGC20A43BDLMD5B	Ice storage	1500	5276	1141	4.62	76	322	1207	161	450	1587	102	450	5800	4120	3820	29000	34900	1450
RTGC20A53BDNDND5B	Ice storage	1600	5627	1214	4.64	81	322	1287	153	450	1692	106	450	5800	4120	3820	29300	35300	1500
RTGC20A73BDPDPD5B	Ice storage	1700	5979	1296	4.61	86	322	1367	158	450	1799	110	450	5800	4120	3820	29500	35500	1550
RTGC20A75BDQDQD5C	Ice storage	1800	6331	1393	4.54	92	385	1448	166	450	1910	114	450	5800	4120	3820	29700	35800	1550



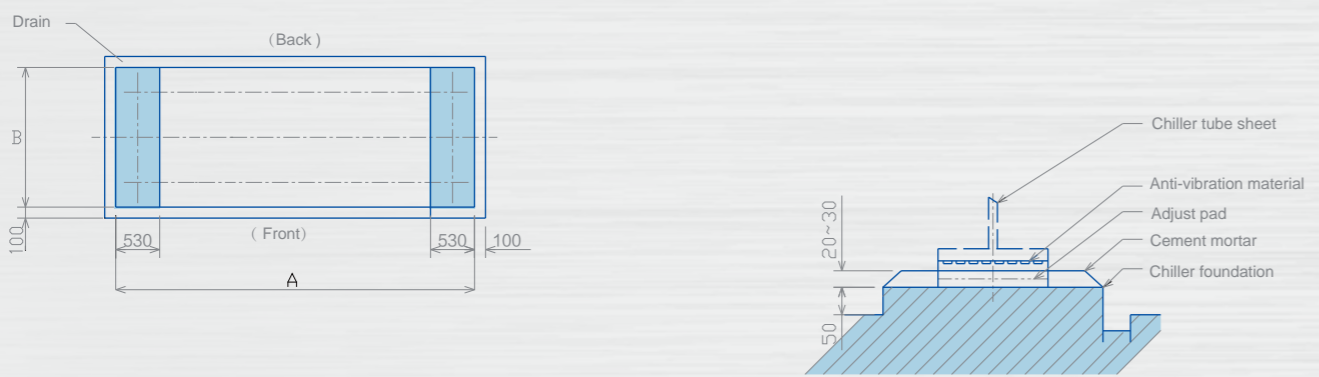
- Note**
01. Above data based on chilled water temp -1.6/-5.6°C and cooling water temp 30/33.5°C.
 02. Standard evaporator and condenser has 2 pass, water side maximum working pressure is 1.0MPa.
 03. Motor start amps will vary according to different working condition.
 04. Above models are only partial of our supply scope, for other models or working conditions, please contact Ebara local office or distributors.

Vessels	A0A4	B0B4	C0C4	A5A9	B5B9	C5C9	BABE	CACE	DADE	DFDK	DLQD
Length (L)	4170	4570	4970	4200	4600	5000	4700	5100	5500	5700	5800
Width (W)	2550	2550	2550	2900	2900	2900	3280	3280	3280	3780	4120
Height (H)	2470	2470	2470	2850	2850	2850	3080	3080	3080	3560	3820
Maintenance Space	3400	3800	4200	3400	3800	4200	3800	4200	4600	4600	4600

RTGC FOUNDATION DRAWINGS

ELECTRICAL CABINET

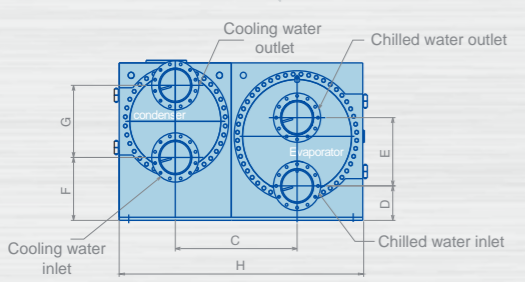
Foundation drawing



Chiller foundation dimension mm

Vesselcode	A0A4	A5A9	B0B4	B5B9	BABE	C0C4	C5C9	CACE	D5D9	DADE	DFDK	DLDQ
A	3900	3900	4300	4300	4300	4700	4700	4700	5100	5100	5100	5100
B	2250	2500	2250	2500	2810	2250	2500	2810	2500	2810	3210	3560

Pipe diameter

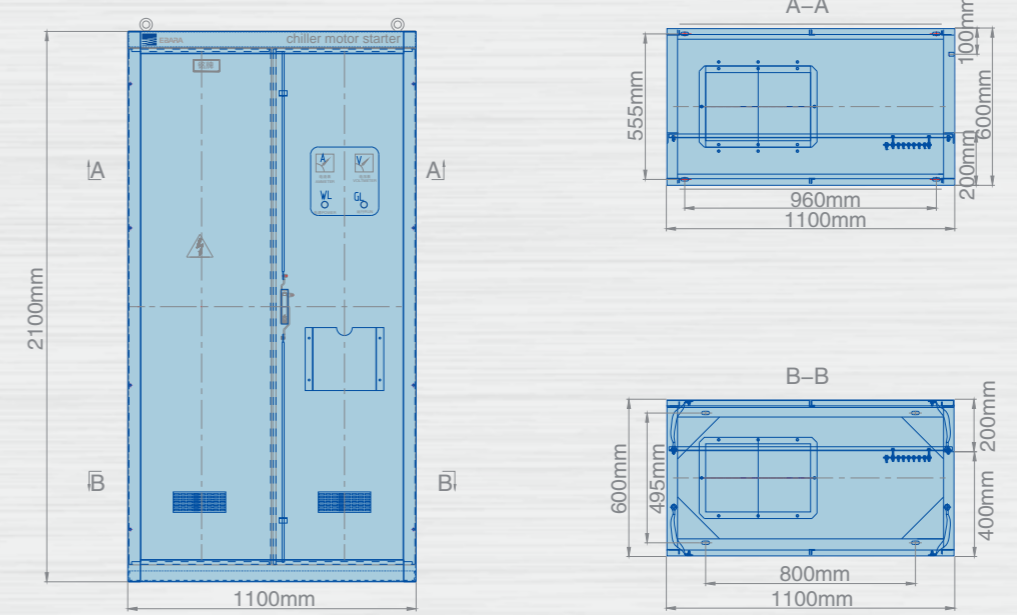


Piping connection size mm

Vesselcode	C	D	E	F	G	H
A0A4/B0B4/C0C4	1020	275	550	515	560	2040
A5A9/B5B9/C5C9/D5D9	1145	355	660	575	700	2290
BABE/CACE/DADE	1300	445	830	705	720	2600
DFDK	1500	545	900	775	800	3000
DLDQ	1675	650	1000	925	900	3350

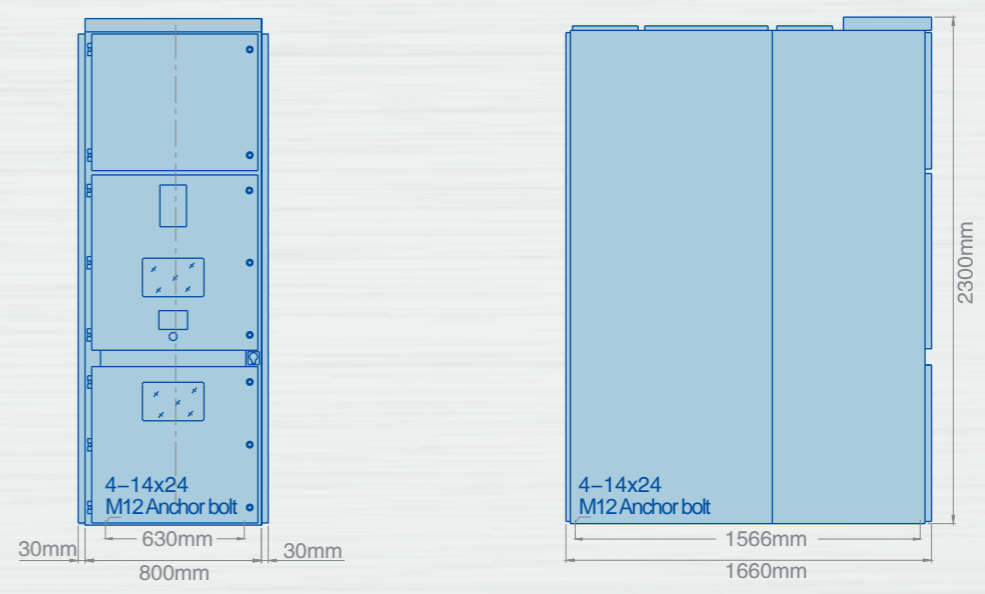
Starter dimension

380 star-delta-starter



Note: Standard starter cable entry and exit are both from bottom.

10kV Direct on line starter

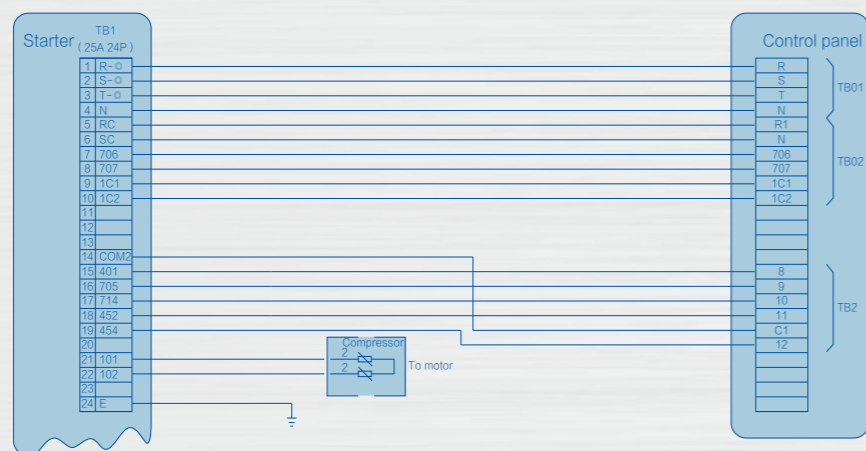


Note: Standard starter cable entry and exit are both from bottom.

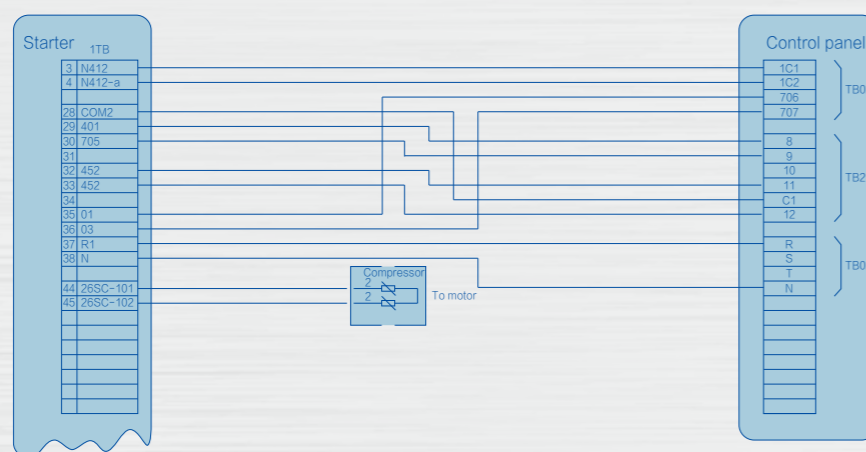
ELECTRICAL CABINET

Wiring diagram between starter & control panel

Low voltage starter(380~460V)



High voltage starter(10/11kV)



Low Voltage Cable Size Recommendation

Power supply 380~415V/50Hz

Cooling capacity	Power cable in (Power supply-starter)	Power cable out (Starter-motor)
500	2 × (YJV3*240) + 2 × YJV95	6 × YJV185+1 × YJV95
550	2 × (YJV3*240) + 2 × YJV95	6 × YJV185+1 × YJV95
600	2 × (YJV3*240) + 2 × YJV95	6 × YJV185+1 × YJV95
650	2 × (YJV3*300) + 2 × YJV120	6 × YJV240+1 × YJV120
700	2 × (YJV3*300) + 2 × YJV120	6 × YJV240+1 × YJV120
750	3 × (YJV3*240) + 2 × YJV150	6 × YJV300+1 × YJV150
800	3 × (YJV3*240) + 2 × YJV150	6 × YJV300+1 × YJV150
850	3 × (YJV3*240) + 2 × YJV150	6 × YJV300+1 × YJV150
900	3 × (YJV3*240) + 2 × YJV185	12 × YJV185+1 × YJV185
1000	3 × (YJV3*240) + 2 × YJV185	12 × YJV185+1 × YJV185
1100	4 × (YJV3*240) + 2 × YJV240	12 × YJV240+1 × YJV240
1200	4 × (YJV3*240) + 2 × YJV240	12 × YJV240+1 × YJV240
1300	4 × (YJV3*300) + 2 × YJV240	12 × YJV300+1 × YJV240
1400	4 × (YJV3*300) + 2 × YJV240	12 × YJV300+1 × YJV240
1500	4 × (YJV3*300) + 2 × YJV240	12 × YJV300+1 × YJV240

NO. 01. Above recommended cable size is NOT applicable for heat pump models but chillers (with AC380V, Y-Delta starter.)

02. Above recommended cable size is just for reference. Plant room temperature/cable length or laying method will affect cable sizing.

03. Power cables as well its connection work mentioned in above are NOT in Ebara scope of supply.

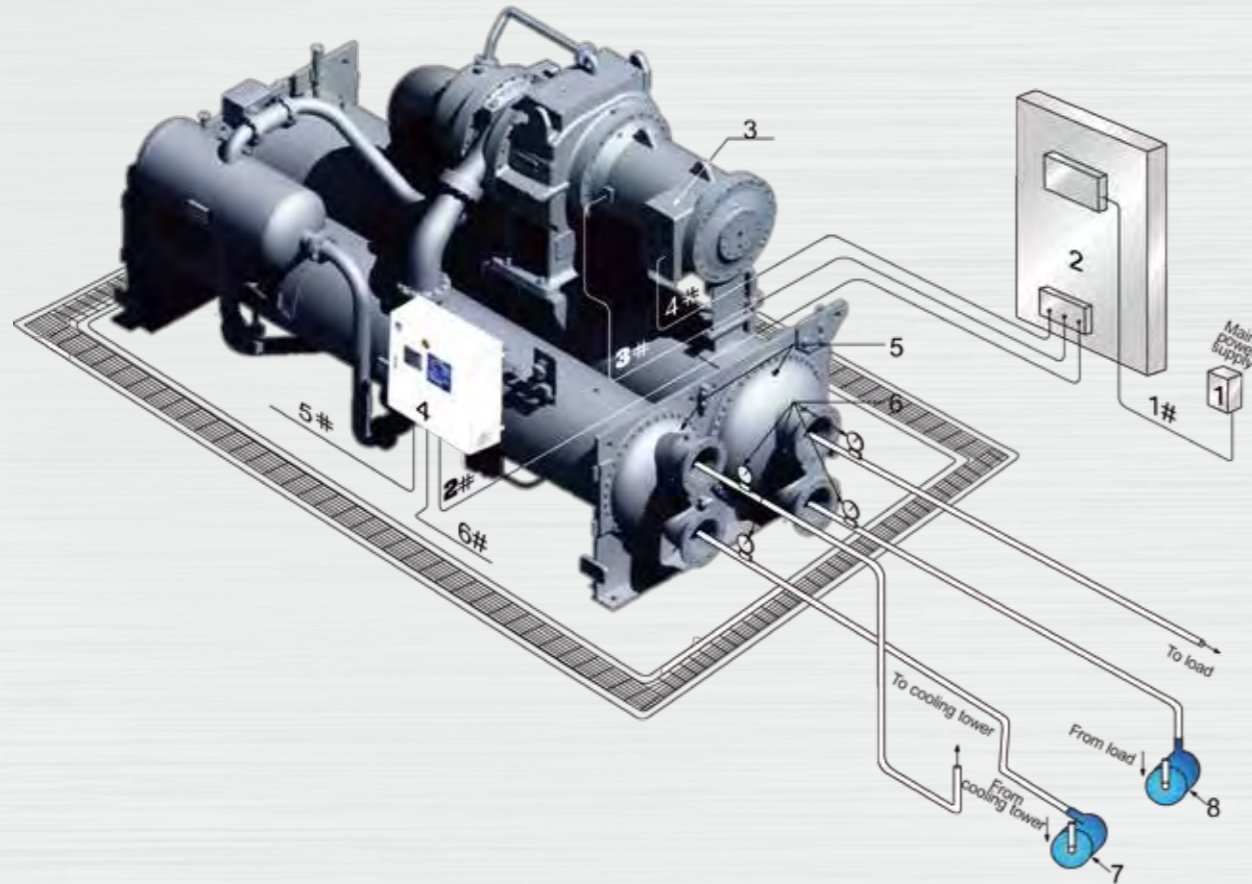
04. Cable can be laid through either trench or bridge, but shall comply with local relevant electrical standard.

- NO.** 01. If it is necessary to drill holes in control panel, please protect the electrical components inside and clean the scrap. And protective sleeve is required to be install in the hole to protect the cable.
02. Do not pull the cable, which may cause damage on terminals or cable protecting insulations.
03. Ensure all cables and wirings are fastened.
04. Do not power on the main motor & oil pump motor when chiller is in vacuum status. It may damage the insulation of motor winds. If insulation testing is required, please conduct the testing in atmosphere and do NOT test the insulation testing for over 2 times.
05. Refer to chiller installation operating & maintenance manual for more detailed information.

RTGC

PLUMBING AND WIRING

PLUMBING AND WIRING



- 1、Circuit breaker 2、Free standing starter 3、Motor terminal box 4、Control panel
5、Ventilating vales 6、Pressure gages 7、Cooling water pump 8、Chilled water pump

No. Illustration

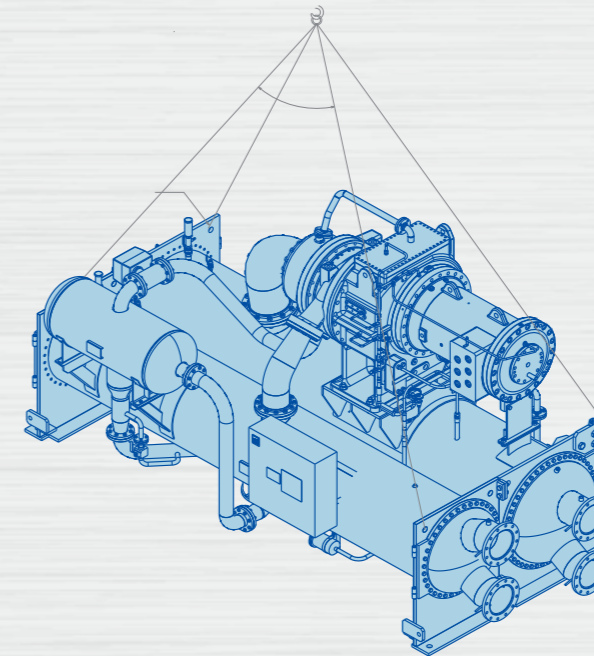
- 1# Power cable to starter
2# Cable from starter to control panel
3# Starter to compressor embedded resistance
4# Starter to compressor motor
5# Controller to accessory equipment
6# Controller to host computer

Note:

- 1.AC 380V/3 phase, neutral line, grounding line
2.The cable between starter to motor is EXCLUDED in Ebara's scope of supply.

HOISTING

HOISTING INSTALLATION INSTRUCTION



01. Set at least 1200mm space at the front of the chiller, either side of the heat exchanger should be enough space or window for heat exchange tube drawing, the rest two sides should be enough space for operators pass through.
02. The chiller should be installed at place where the levelness can be guaranteed, and can fully bear the chiller operating weight.
03. After chiller located on the foundation, it must be adjusted on level; the level deviation should be within 1/1000.
04. For the outlet of the safety valve, the connecting pipe to it should be set to safe place, and the water drain pipe should not put any weight on the safety valve, in the meanwhile, please set the rubber soft connecting pipe to avoid any vibration pass to buildings.
05. For the inlet and outlet piping of the chiller chilled water (refrigerant medium) and cooling water, please install manual valve and thermal meter, which will be better for chiller commissioning and maintenance.
06. For the pipes connected to chilled water and cooling water, the pipe inlet and outlet direction should be according to the specification, and water pipe diameter should not be too small.
07. Please set 10 meshes or above filter at the chilled water and cooling water inlet, to protect heat transfer tube and avoid any block happen.
08. As to the water (refrigerant medium) quality, beside the concentration, the PH value (7.5~8.5) will also need to be managed, especially when the refrigerant medium is open, and refrigerant medium change with the contacting to air, the management should be strictly followed, the sediment need to be filter out.
09. The power supply to chiller should be enough in volume, the voltage vibration should be less than $\pm 10\%$. Chiller should be wired to ground properly.

RTGC

SCOPE OF SUPPLY

SCOPE OF SUPPLY

standard scope of supply list

item	Ebara	Customer Note	Item	Ebara	Customer Note
Chiller	Chiller	■	Electrical installation	Main power line crimping	■
	Starting cabinet	■		Wiring between start cabinet and control cabinet	■
	Refrigerant	■		Line crimping between start cabinet and control cabinet	■
	Lubricating oil	■		Wiring between start cabinet and compressor	■
	Connecting flange	■		Line crimping between start cabinet and compressor	■
	Anchor bolt	■		The auxiliary interlock wiring	■
	Anchor damping pad	■		Line crimping for the auxiliary interlock	■
	Cold/heat insulation	■			
Shipment & Installation	Foundation Installation	■	Start-up & Maintenance		■
	From factory to China seaport	■			■
	Shipment cost	■			■
	Customs clearance	■	others		■
	Shipment to jobsite	■			■
	Level adjustment	■			■
	Anchor bolt installation	■			■
	Starting cabinet installation	■			■

optional supply list

Item	Standard supply	Options	Item	Standard supply	Options
Starter type (380V)	Star-triangle start-up	Soft start-up Variable frequency starting	Refrigerant insulation valve	None	Optional
Starter type (10000V)	Direct start-up	Autotransformer starting reactor starting	Water side working pressure	1.0MPa	1.6MPa、2.0MPa
Hot gas bypass	None	Optional	Inlet/outlet water pipe direction	Same side	Different side
Vibration isolator	Rubber damping pad	Spring isolator	Split shipment	Whole unit shipment	Split shipment according to customer's request
Main motor inverter	None	Optional	Material for heat exchanger	Copper	Stainless steel Copper nickel tube

REFERENCE OF WATER QUALITY

Reference of water quality

Bad chilled water and cooling water quality is not only scaling inside the heat transfer tube, reducing heat exchange and chiller efficiency, but also corrosive to the heat transfer tube, and break down the chiller. The water quality reference data in the below sheet is by GB 50050-95 standard (industrial circulating water design standard). Please use soft water if the chilled water system is in closed cycle. Please do periodical random analysis for cooling water (open cycle) during chiller operating, and water quality should meet the demand below. If not, please do water treatment.

Item	Cooling water system		Chilled water system		Effect to chiller	
	Circulating water	Make-up water (below 20 C)	Circulating water	Make-up water	Corrosion	Scaling
PH[25 C] [25 C](μS/cm)	6.8~8.2	6.0~8.0	6.8~8.2	6.8~8.0	■	■
Cl-(mgCl-/L)	800	300	400	300	■	■
SO42-(mg/L)	200	50	200	50	■	
[PH4.8] (mgCaCO3/L)	100	50	100	50		■
(mgCaCO3/L)	200	50	200	200		■
(mgCaCO3/L)	150	30	150	150		■
(mgSiO2/L)	50	30	30	30		■

Routine Management

- Clean the cooling water pipe before water goes through it.
- During the chiller operating season, analyze the water quality 1~2 times each month, make sure the data for all the checking items are within the standard value. Meanwhile, judge the tendency of the PH and electric conductivity.
- Beside the content mentioned above, considering the concentration during circulation, please change the cooling water each month for the open cycle system.
- If the PH and electric conductivity is above set value, please operate as the sequence below:
 - Test all the items for water quality checking.
 - If the water is tend to be corrosive, please check if the cooling tower location is appropriate. Adjust the ball float valve to reduce the concentration index to less than 3 times (normally check the chloridion index). If it's still doesn't work, please discuss with the professional water treatment company and take relevant steps.
 - If the water is tend to be scaling, please take step of cleaning the chiller(use hairbrush or chemical wash) as the way to handle.

RTGC SERVICE NETWORK

SERVICE NETWORK



1 Profession

Ebara supply technical support for each chiller during its life span. We can remotely monitor our chiller operating by internet technology, analyzing the chiller real-time operating data and save them in the data base.

3 Convenient

With its world-wide service network, Ebara guarantee the most convenient and fast service for all our customers.

2 Intimate

Since its first chiller sales in the international market, Ebara has been trusted by our customers by advanced technology and excellent after-sales service, we have established true friendship between customer and Ebara. Ebara visit customers regularly to check the chiller operating status, and hold customer training of operating in both theoretical and practical.

4 Trust

In China central air conditioning market, Ebara was voted to be the Top one manufacturer of "Brand Reputation" and "Customer Satisfaction".

JOB REFERENCE

Job Reference

