



Water-Cooled chiller (Brine Type)

[Your satisfaction is always our cherished desire!]



AirTrojan International Co., Ltd.

<http://www.airtrojan.com>

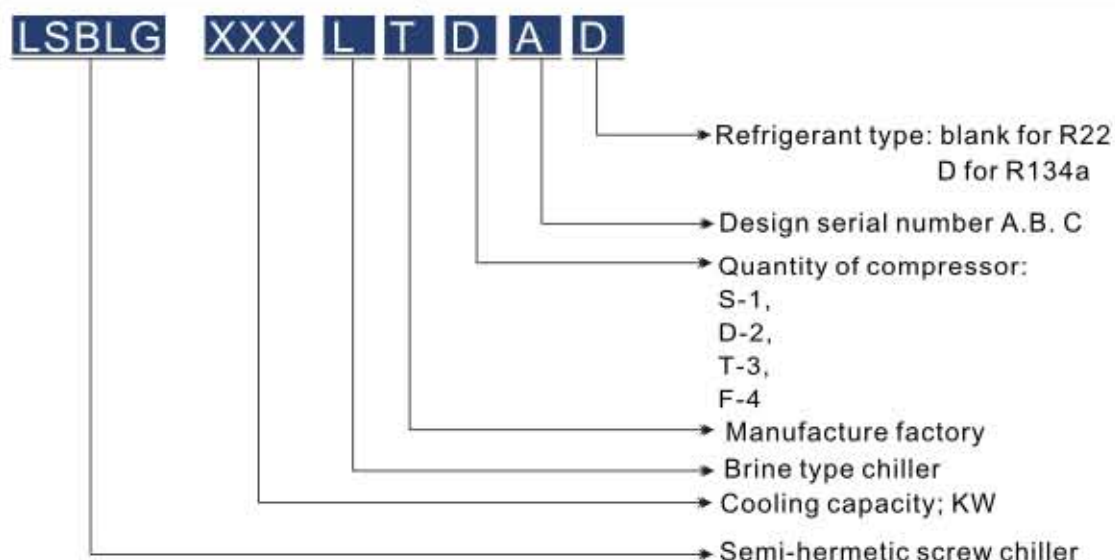
ATC-300B-08



The models and specifications of equipment listed in this catalog shall be subject to change without any prior notification due to product updating.

Product features

Model Code Description



Product features

- Excellent cold-accumulation ability, chilled water as cold as -10°C achievable.
- High quality imported parts, multiple protection functions to ensure excellent performance.
- Full series of models selectable, well meet the requirements of different industries.
- Special customized orders acceptable.

Microcomputer controller

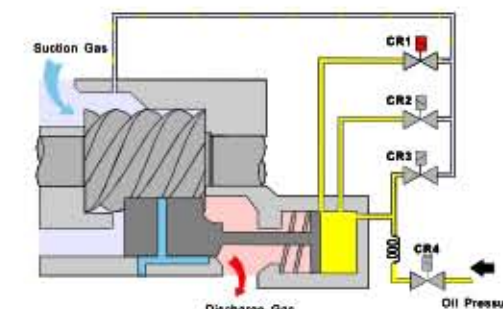
- Advanced high-speed built-in microprocessor is employed, and its performance is far better than single-chip computers in the industry.
- Surface Mounting Technique (SMT) is employed for the main board, with a compact structure, low heat generation, and good anti-interference capability.
- A serial port is reserved for the main board to directly download programs from PCs quickly, thus facilitating program upgrading and hardware expansion.
- 485 communication transmission technology is employed, with a long data transmission distance up to 1200 m without signal attenuation. If a relay is added, the communication distance can go beyond 3000 m. (optional)
- A quick operation guide is provided for the user's reference.
- The actual temperatures of various points in the real flow chart can be consulted at any time.
- Switch on quantity input and relay output can be queried. The temperature can be modified and set. The temperature curve for one hour and one day can be displayed.
- Current and history faults can be queried. With fault data record function, the unstable part of the equipment can be analyzed to improve the performance. History faults can be queried in three methods, namely, fault signal, fault times and fault occurrence time.
- Remote control ON/OFF can be achieved. One-time timed startup/ shutdown/ weekly timed startup and shutdown. Maximum to three times of timed startup and shutdown can be achieved in one single day.
- Varied interface display styles, and users can choose their favorite interface display for setup.
- Multiple language switch is supported.

Compressor

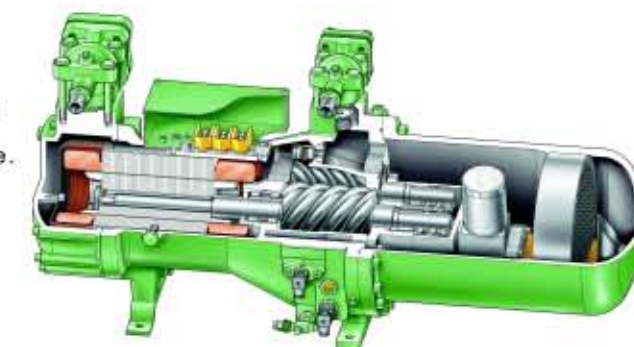
- High efficiency design
Further geometric design
High hardness
High edge line speed
Patent manufacturing process
- Slide valve with completed economizer joint
Realizable non-stage and stepwise capacity modulation
The sucking position of economizer can be adjusted in accordance with the slide valve Partial load efficiency is high



- Optimized oil circuit design
Three-level oil separator
Long life span oil filter
Low pressure bearing chamber
- Four capacity modulation solenoid valves can satisfy:
25%-50%-75%-100% Four-level capacity modulation
25%-100% non-stage capacity modulation for option



- Patent dual-layer shell with steady pressure compensation function
Extremely stable performance, even under high pressure, the shell will not expand, and it can greatly reduce noise.
Reliable low pressure bearing chamber, long life-span bearing
- Double way bearing, strong and durable.
Sealed ring isolate the bearing chamber and the high pressure to reduce bearing pressure.
- Perfect standard fittings
Oil heater
Internal discharge pressure valve
Air exhaust check valve
Air exhaust stop valve



Condenser and Evaporator

- Every unit adopts high efficient horizontal shell-tube heat exchangers, and all heat exchangers are with "BR1" class Chinese national pressure vessel manufacture permission. All products are manufactured with superior quality pipes, plates and threaded copper tubes, through digital control machine and full automatic welding equipment processing. The products all pass pressure test, and get the approval of the relative national examination organization.
Thread copper tube can greatly strengthen the heat exchange efficiency between the refrigerant and water. The advantages include artistic appearances, compact size, high heat exchange efficiency, and low failure rate etc. All heat exchangers are complies with GB150 (steel pressure vessel), GB151 (shell and Tube Heat Exchangers), JB/T4750-2003 (Pressure Vessels for cooling devices), and other related national laws and regulations.



Standard series performance parameters

Dual-Screw Single System series (R-22)(Bitzer compressor)

Model		LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	
Item		132L TSA	165L TSA	193L TSA	223L TSA	256L TSA	317L TSA	363L TSA	419L TSA	547L TSA	630L TSA	723L TSA	790L TSA	872L TSA	
Power supply	-	3PH-380V-50Hz													
Cooling capacity (of ice storage (Brine water outlet temperature))	-8°C	kcal/h	54,180	69,660	77,400	92,020	107,500	136,740	149,840	176,300	216,720	259,720	305,300	337,120	372,380
		KW	63	81	90	107	125	159	174	205	252	302	355	392	433
	-10°C	kcal/h	49,020	63,640	70,520	83,420	96,900	124,700	133,880	160,820	196,940	235,640	278,640	307,680	338,840
		KW	57	74	82	97	115	145	158	187	229	274	324	358	384
Cooling capacity of the chiller	kcal/h	113,520	141,900	165,880	191,780	220,160	272,620	312,180	360,340	470,420	541,800	621,780	679,400	749,920	
	KW	132	165	193	223	256	317	363	419	547	630	723	790	872	
Power consumption	KW	27.9/27.5/31	34.9/34.4/38	39.4/38.9/43	46.2/45.5/51	53.5/52.7/58	70.1/69.3/76.4	71.9/70.3/80	84.3/83.1/90	109.4/107.8/115	122.5/120.6/136	141.5/139.4/153	163.5/160.9/178.4	183.5/181.5/199.2	
Operating current	A	50.0/49.5/54	61.9/61.3/66	69.3/68.6/75	80.1/79.2/87	89.1/88.0/95	113/111.8/116	124.9/123.4/116	139.9/138.1/153	181.2/176.8/186	195.7/196.6/226	227/224/252	268/264/291	300/296/324	
Startup current	A	218D/411D	269D/508D	290D/485D	350D/585D	423D/686D	520D/801D	612D/943D	665D/1023D	865Y/1442D	586Y/1853D	650Y/2029D	805Y/2520D	805Y/2520D	
Capacity Modulation	%	100-75-50-25-0													
Compressor	Type	Semi-hermetic dual-screw													
	Quantity	1													
	Startup Method	Part Winding						Star→Delta							
	Oil heater	W	200						300						
Refrigerant (mL Oil)	Type	B320SH													
	Charging Volume	L	9			15			22			28			35
Refrigerant	Type	R22													
	Charging Volume	kg	21	26	30	35	40	50	57	66	86	98	113	126	142
	Throttling Method	Thermo-sensing external even pressure expansion valve													
	Type	High efficiency shell and tube heat exchanger													
Evaporator	Quantity	1													
	Refrigerant liquid flow	m³/h	9	12	13	16	19	24	26	31	38	45	53	59	65
	Refrigerant liquid flow	m³/h	9	11	12	15	17	22	24	28	34	41	49	54	59
	Chilled water flow	m³/h	23	28	33	38	44	55	63	72	94	109	125	136	150
	Water Head Loss	kPa	54	54	57	59	59	62	62	65	65	67	67	69	69
	Pipe Diameter	-	2-1/2"	2-1/2"	2-1/2"	2-1/2"	3"	3"	3"	3"	4"	4"	4"	5"	5"
Condenser	Type	High efficiency shell and tube heat exchanger													
	Quantity	1													
	Refrigerant liquid flow	m³/h	16	20	22	26	31	39	42	50	62	73	86	96	106
	Refrigerant liquid flow	m³/h	15	19	21	25	29	37	39	47	58	68	80	89	99
	Chilled water flow	m³/h	28	35	41	47	54	68	76	88	114	132	151	167	185
	Water Head Loss	kPa	51	51	54	54	54	57	57	59	59	62	62	62	65
Protective Devices	-	Compressor built-in protection, high voltage protection, low voltage protection, compressor overload protection, over high voltage, over low voltage protection, default phase protection and phase-sequence protection, anti-freezing switch, evaporator water flow protection, condenser water flow protection, cooling water pump overload protection, chilled water pump overload protection, cooling tower fan overload protection, cooling water temperature over high protection, fusible latch, oil level switch and oil pressure differential switch is optional.													
	Dimen sion	L	mm	2175	2195	2245	2860	2860	2985	2975	3010	3510	3590	3595	3600
	W	mm	935	935	935	1015	1015	1015	1025	1055	1105	1105	1175	1180	1180
	H		1430	1500	1655	1710	1710	1965	1975	1990	2140	2155	2195	2200	2200
Net weight	kg	1020	1060	1270	1370	1400	1870	1980	2070	2790	2910	3240	3360	3480	
Operation weight	kg	1120	1180	1420	1550	1580	2100	2220	2340	3120	3240	3760	3880	4000	
Operation noise	dB(A)	72	72	76	76	76	80	80	80	84	84	84	86	86	

Note: 1. The above parameters are tested under following conditions: Brine water inlet temperature -3°C, outlet temperature -8°C, cooled water inlet temperature 30°C, outlet temperature 35°C, the fouling coefficient: 0.0001 m² C/W.
2. Above spec. will be subject to changes without prior notice.
3. State your special requirements when place the order.



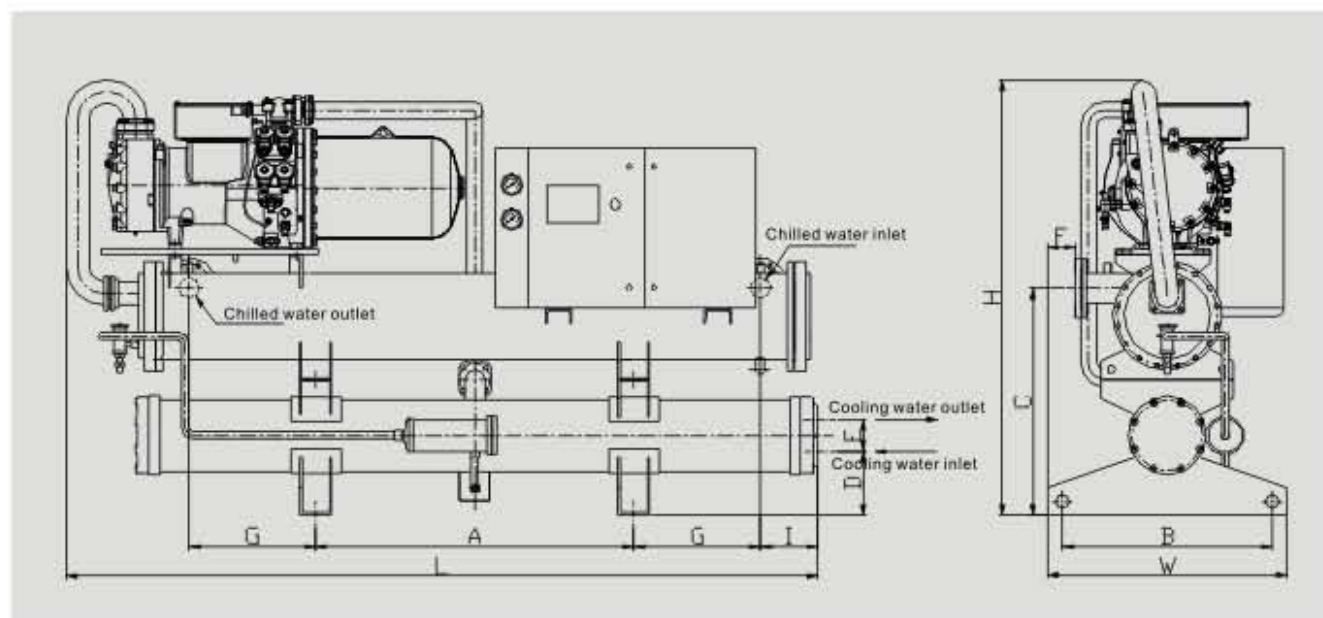
Standard series performance parameters

Dual-Screw Single System series (R-22)(Bitzer compressor)

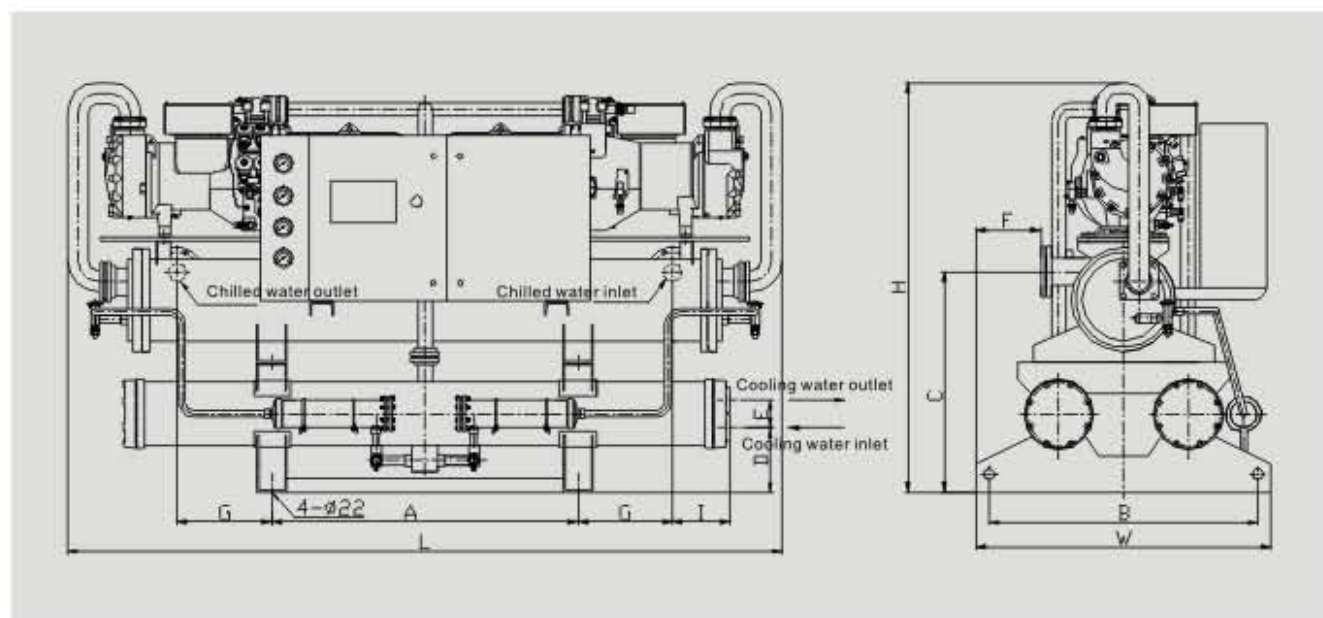
Model		LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG	LSBLG		
Item		263LTDA	330LTDA	385LTDA	446LTDA	512LTDA	637LTDA	725LTDA	839LTDA	1093LTDA	1260LTDA	1446LTDA	1580LTDA	1744LTDA	
Power supply		-	3PH-380V-50Hz												
Cooling capacity of ice storage (Brine water outlet temperature)	-8℃	kcal/h	108,360	139,320	154,800	184,040	215,000	273,480	299,280	352,600	433,440	519,440	610,600	674,240	744,760
		kW	126	162	180	214	250	318	348	410	504	604	710	784	866
	-10℃	kcal/h	98,040	127,280	141,040	166,840	197,800	249,400	271,760	321,640	393,880	471,280	557,280	615,760	677,680
		kW	114	148	164	194	230	290	316	374	458	548	648	716	788
Cooling capacity of the chiller		kcal/h	226,180	283,800	331,100	383,560	440,320	547,820	623,500	721,540	939,980	1,083,600	1,243,560	1,358,800	1,499,840
		kW	263	330	385	446	512	637	725	839	1093	1260	1446	1580	1744
Power consumption		kW	55.8/55.8/2	69.8/69.8/75	78.8/77.8/87	92.8/91/102	107/105.4/115	140.2/138/152.8	143.8/141.8/160	168.6/166.2/180	218.8/215.6/230	245/241.2/272	283/278.8/305	327/321.8/358	367.2/352.2/398
Operating current		A	109/99/106	123.8/122.3/132	138.8/137.2/148	166.2/158.4/173	178.2/176/190	229.8/223.8/232	248.8/246.8/273	279.8/276.2/305	362.4/357.8/373	399.4/393.6/432	454/448/504	530/528/582	609/592/648
Startup current		A	218D/411D	269D/508D	290D/485D	350D/585D	423D/686D	520D/801D	612D/943D	665D/1023D	865Y/1442D	586Y/1853D	650Y/2029D	805Y/2520D	805Y/2520D
Capacity Modulation		%	100-75-50-25-0												
Compressor	Type	-	Semi-hermetic dual-screw												
	Quantity	-	2												
	Startup Method	-	Part Winding								Star→Delta				
	Oil heater	W	200x2						300x2						
Refrigerant and Oil	Type	-	B320SH												
	Charging Volume	L	9x2		15x2			22x2			26x2			35x2	
Refrigerant	Type	-	R22												
	Charging Volume	kg	21x2	26x2	30x2	35x2	40x2	50x2	57x2	66x2	86x2	98x2	113x2	126x2	142x2
	Throttling Method	-	Thermo- sensing external even pressure expansion valve												
	Type	-	High efficiency shell and tube heat exchanger												
Evaporator	Quantity	-	1												
	Refrigerant liquid flow	m³/h	19	24	27	32	37	48	52	61	76	91	106	117	130
	Refrigerant liquid flow	m³/h	17	22	25	29	34	43	47	56	69	82	97	107	118
	Chilled water flow	m³/h	45	57	66	77	88	110	125	145	188	217	249	272	300
	Water Head Loss	kPa	57	57	59	62	62	65	65	65	67	67	69	69	72
	Pipe Diameter	-	3"	3"	3"	4"	4"	4"	4"	5"	5"	6"	6"	6"	6"
	Evaporator	Type	-	High efficiency shell and tube heat exchanger											
Quantity		-	1												
Refrigerant liquid flow		m³/h	31	40	45	53	61	79	85	100	125	146	171	191	212
Refrigerant liquid flow		m³/h	29	37	42	49	58	74	79	93	116	136	160	179	198
Chilled water flow		m³/h	56	70	81	94	108	136	152	176	228	264	302	334	369
Water Head Loss		kPa	51	51	54	54	54	57	57	57	59	59	62	62	65
Pipe Diameter		-	2"x2	2"x2	2"x2	2"x2	2-1/2"x2	2-1/2"x2	3"x2	3"x2	3"x2	4"x2	4"x2	4"x2	5"x2
Protective Devices		-	Compressor built-in protection, high voltage protection, low voltage protection, compressor overload protection, over high voltage, over low voltage protection, default phase protection and phase-sequence protection, anti-freezing switch, evaporator water flow protection, condenser water flow protection, cooling water pump overload protection, chilled water pump overload protection, cooling tower fan overload protection, cooling water temperature over high protection, fusible latch, oil level switch and oil pressure differential switch is optional.												
Dimension	L	mm	3060	3060	3175	3180	3180	3820	3830	4330	4330	4330	4350	4350	
	W	mm	1150	1150	1250	1250	1250	1400	1400	1400	1600	1750	1750	1800	1800
	H		1525	1525	1805	1830	1830	2080	2125	2130	2300	2330	2365	2380	2380
Net weight		kg	1790	1790	2340	2420	2500	3580	3750	3880	5050	5340	5600	5860	6120
Operation weight		kg	1920	1970	2520	2620	2710	3920	4110	4250	5490	5830	6260	6700	7120
Operation noise		dB(A)	74	74	78	78	78	82	82	82	86	86	86	88	88

Structure Figures and Dimensions

Dual-Screw Single System Series (R-22) (Bitzer compressor)



Dual-Screw Double System Series (R-22) (Bitzer compressor)



Installation

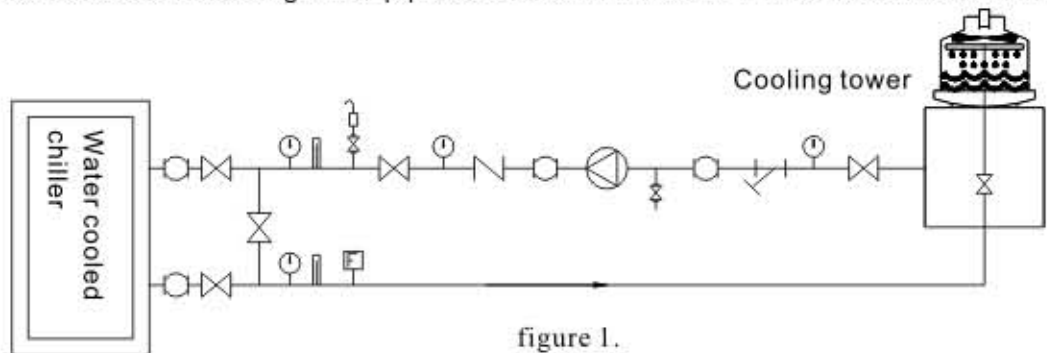
Glycol aqueous solution($C_2H_6O_2$)/E.G

Temperature °C	-40	-35	-30	-25	-20	-15	-10	-5	-0	5	10
Consistency wt%											
30						8.1	6.36	5.4	4.1	3.4	2.84
Viscosity(C.P)						1.048	1.047	1.046	1.045	1.043	1.042
Density(g/cm ³)						0.417	0.418	0.419	0.42	0.421	0.422
Heat Transfer Coefficient(kcal/mhr °c)						0.864	0.869	0.873	0.877	0.882	0.886
Specific Heat(kcal/kg °C)						15.4	11.9	9.2	7.2	5.8	4.7
40						1.066	1.065	1.063	1.061	1.06	1.058
Viscosity(C.P)						0.392	0.392	0.392	0.3925	0.393	0.393
Density(g/cm ³)						0.789	0.795	0.8	0.806	0.812	0.818
Heat Transfer Coefficient(kcal/mhr °c)						27.7	23.2	18.7	14.2	11	8.55
Specific Heat(kcal/kg °C)						1.078	1.075	1.074	1.073	1.071	1.069
Viscosity(C.P)						0.381	0.381	0.381	0.381	0.381	0.381
Density(g/cm ³)						0.74	0.748	0.756	0.764	0.771	0.778
Heat Transfer Coefficient(kcal/mhr °c)						59.0	41.6	30.0	22.0	16.5	12.8
Specific Heat(kcal/kg °C)						1.087	1.085	1.083	1.082	1.08	1.078
Viscosity(C.P)						0.732	0.371	0.371	0.37	0.37	0.369
Density(g/cm ³)						0.691	0.701	0.712	0.722	0.732	0.741
Heat Transfer Coefficient(kcal/mhr °c)						105.2	80.5	55.8	39.5	28.5	20.95
Specific Heat(kcal/kg °C)						1.096	1.095	1.094	1.092	1.09	1.088
Viscosity(C.P)						0.395	0.359	0.359	0.358	0.357	0.36
Density(g/cm ³)						0.656	0.666	0.676	0.687	0.697	0.706
Heat Transfer Coefficient(kcal/mhr °c)						0.3555	0.355	0.355	0.355	0.355	0.355
Specific Heat(kcal/kg °C)						0.715	0.724	0.73	0.739	0.747	

The piping of water system

- 1.The water inlet and outlet pipes of the machine and the valves shall have good heat preservation, avoiding the cooling loss and condensation
- 2.To ensure enough water supply in the evaporator and condenser and pipe system, the water flow switch shall be installed on the water outlet side of the evaporator and condenser and shall be in interlock control with the compressor. Thus it can avoid the inner frozen, over low pressure, bad oil return or pressure over high or condensation pressure over high and so on due to water lack
- 3.When multiple heat exchanger and chillers are in parallel connection, in order to keep the water flow of each heat exchanger the same, the resistance in pipes between the chillers and heat exchanger shall be equal
- 4.In case of close loop type water system, to reduce the expansion or contraction of water volume and to avoid the influence on water pipes by compensation water pressure expansion, water tank should be installed at water return position.
Note: the water surface of the expansion water tank should be at least 1 meter higher than the highest point of the water pipe system.
- 5.The chilled water pump shall be installed at the inlet side of evaporator.
- 6.To avoid air staying in the water system, automatic air discharge valves(vent valve) shall be installed at the highest point of water pipes. And the water pipe in transverse direction shall be constructed at the upward slope of 1/250 degree. Rust shall be removed before water pipes are fixed .and the pipes shall be free of slay and be kept clean before the machine is put into operation.
- 7.Water pipe outlet shall have shockproof hose to avoid the vibration of the chiller influence indoors through piping.
- 8.Thermometer and pressure gauge shall be installed at water outlet/inlet of the machine for easy maintenance and daily check.
- 9.When the chiller is running, the water flow or the nonfreezing solution flow inside the evaporator shall be above the allowed minimum flow volume.

10. Pipe connection base for piping accessory shall be set at the water in/out pipes, for the easy water pipe separation in case of check and repair is needed.
11. The weight of water pipes shall not be borne by the machine, the water outlet/inlet of water pump shall be connected with related water pipes through the shockproof water pipes or rubber connector, to avoid the transmission of vibration and noise and interference.
12. The condenser and cooling water pipes are recommended to be installed as shown in figure 1.



- 13 The evaporator and chilled water pipes are recommended to be installed as shown in Figure 2.

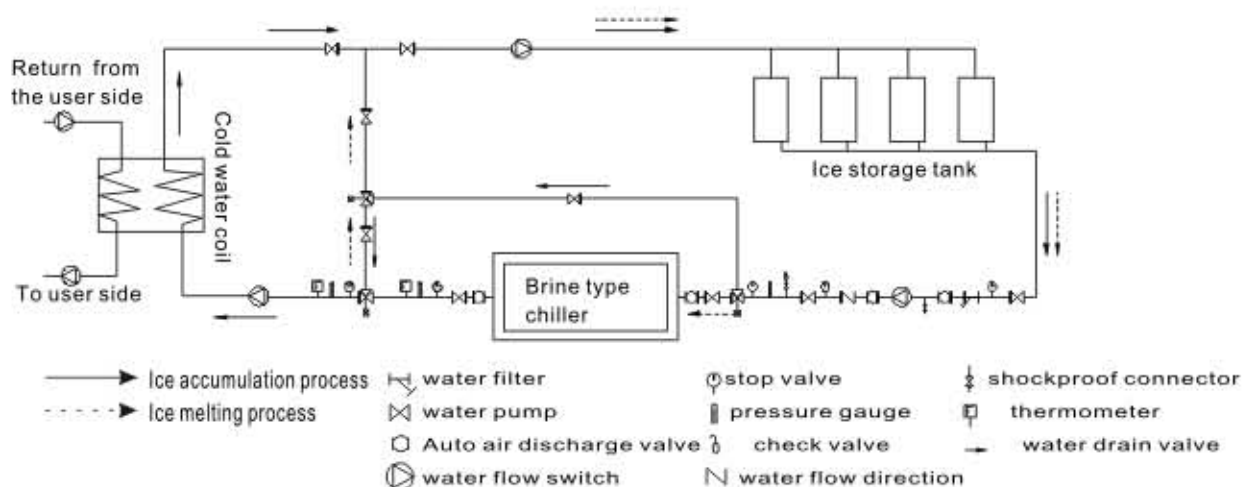
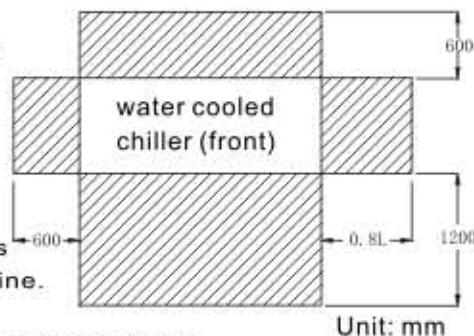


Figure 2 Brine type chiller water system piping diagram

Hoisting and foundation installation

- Choose the ground which can bear the weight of the machine under operation conditions. The ground shall be solid enough, and not to generate the resonance and noise easily.
- Keep the machine away from rain, wind blowing, direct sunlight or other heat sources.
- The ambient temperature shall be controlled within 0°C-40°C, and the relative humidity within 75%. The location is well ventilated and should be free from dust
- Near power supply and convenient for construction.
- Easy for maintenance and check. Preserve the service space as shown in the figure. In the figure, L indicates the length of machine. Please refer to our brine type water cooled chiller catalogue. For the cleaning space of 0.8L for the condenser, choose either left or right side



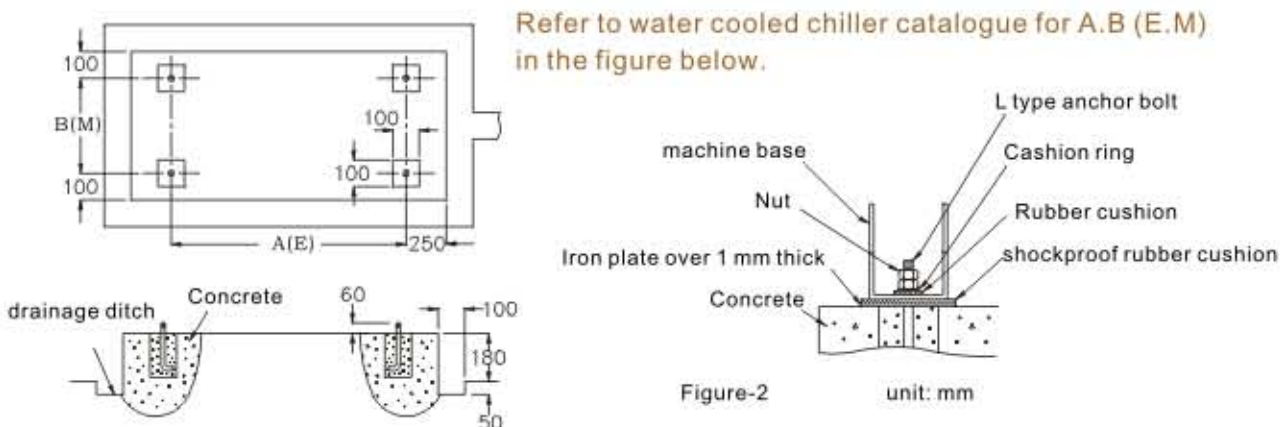
Foundation platform

The cement foundation platform shall be constructed by referring to the machine weight under operating condition. Place steel bars(diameter above 9.5 mm) at the interval of 10 cm in two layers inside the platform to reinforce the hardness.

When cement foundation platform is constructed on concrete floor, the floor surface shall be made coarse. After cleaning the floor, watering it and then starting to construct.

The cement foundation platform uses the concrete at the proportion of 1:2:4. Bury anchor bolts according to related requirements. The foundation platform surface shall be polished and kept horizontal.

After the concrete of the foundation platform dries completely, the machine can be installed on it. Good drainage shall be ensured around the foundation platform. No accumulated water or other conditions which will affect the environment around the machine.



Hoisting

Prepare the hoisting plan in advance, including the installation date, dimensions, weight, carry path, preservation holes and hoisting devices, as shown in Table-1

Item		Emphasis
Hauling	Route	1 Verify the corridors, stair doors, and handling routes are ok 2 Verify the roof, undergrounds, and hauling routes are ok
	Unloading	1 Verify the weight of the equipment 2 Prepare the unloading equipments 3 Verify the storage space
	Hauling	1 The large hoisting equipments which can be disassembled should be disassembled first and carried to the installation site, and assembled at site. 2 If the hoisting equipments can not be disassembled, they shall be hauled through the openings on the wall or ground
Suggestions		if necessary, the wall and floor shall be modified to facilitate the hauling and hoisting.

- 1 The machine hoisting shall comply with the safety regulations on building site. During hoisting, it is recommended that someone shall be assigned as a hoisting guide. Warning methods shall be taken to ensure the safety of machine and persons on spot.
- 2 Rollers and hooks shall be used in the hauling and hoisting process. Do not directly beat and not apply rope on the weak parts such as copper pipes, valve body, and control box etc. protection cushion shall be placed at the contact points between the machine and ropes, as shown below. Handle with care. Avoid shaking and collision, preventing the machine and building from being damaged and the person.