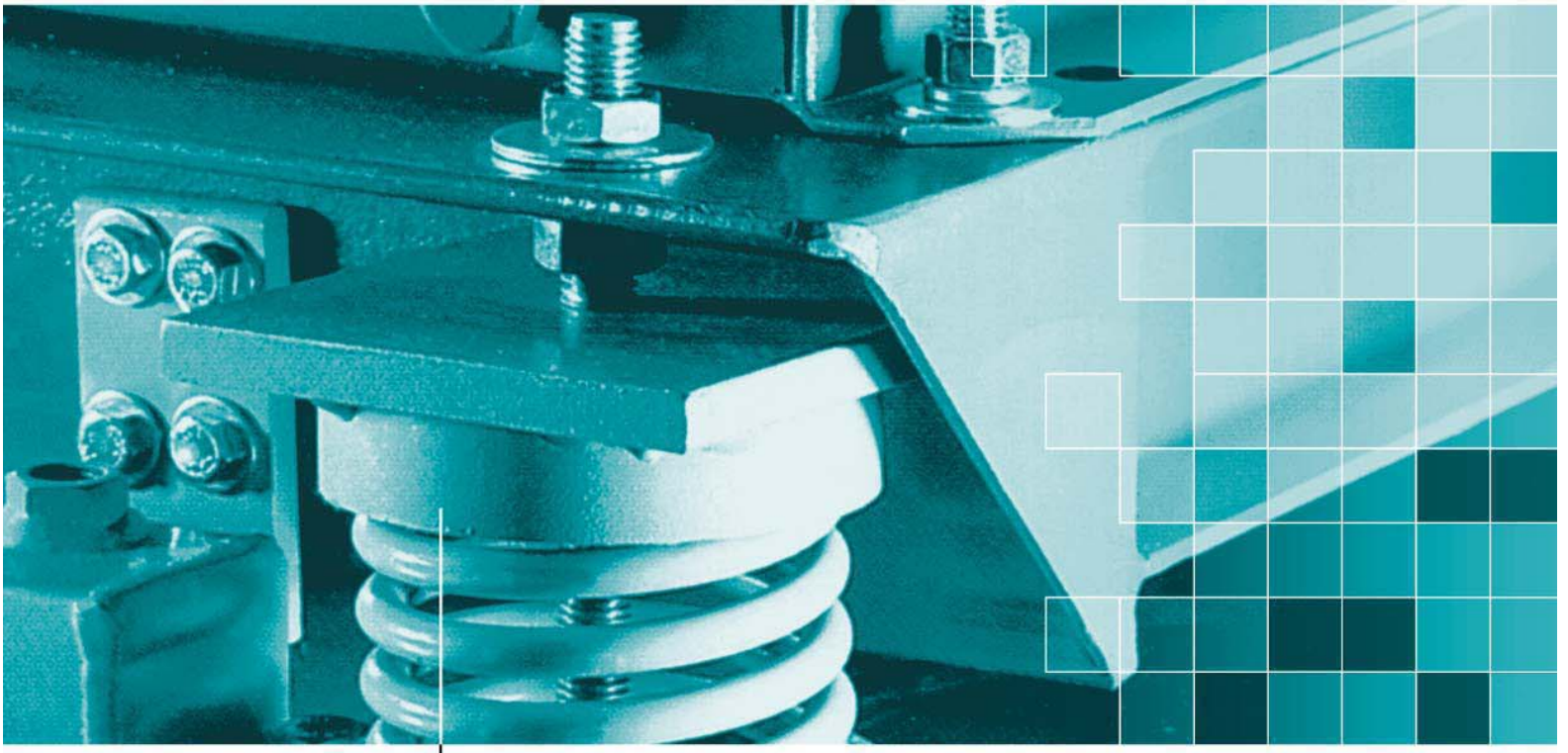
Mammoth®
The Leader In Custom HVAC & Energy Saving



Water-cooled Screw Chiller

155kW-2,437kW(R134a,50Hz)

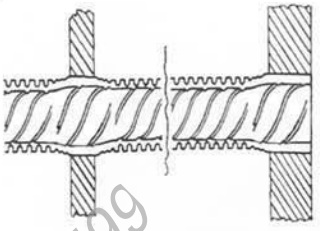
Mammoth (Shanghai) Air Conditioning Ltd.

Mammoth MSW series water cooled chiller has wide range of application, not only work as traditional A/C but also offer water, ice storage and domestic hot water etc. for industrial use. Standard unit's cooling capacity range is from 128KW to 1914KW, divided into ten models.

Superior Quality Compressor

Mammoth chiller uses semi-hermetic screw compressor, with no bearing leakage. Twin screw gas discharge and the new developed Y type moulding, optimized circumferential speed and advanced tooth design lead to higher compressing efficiency.
Motor and compressor housing are coupling forged with high precision. Double wall pressure compensated rotator shell has the extremely strength, and there is no expansion even in high pressure condition and unit noise is reduced at the same time.
Imported fluoride-resistant motor has high efficiency and good reliability. Twin screw heat can stand wear and tear. Using tongue shape round seal to isolate the the bearing cavity to get a lower axial cavity pressure. Motor thermal protection PTC will keep its safety operation.
The oil line design, inner patented three grades oil separator, and the long life expectancy with μm grade precise filter. Hermetic low pressure bearing cavity improves lubrication, the de-pressurized bearing room, ensures minimum refrigerant mixed in oil, the oil's viscidity will be higher. Compared with normal design, the oil's viscidity will be improved nearly up to 1 time.
Oil is supplied by pressure difference, and it is not necassary to design additional complicated oil system, like oil cooler and oil pump etc. Compressor is direct driven by motor with less moving components reduces wear and tear, and gains high mechanical efficiency. Optional stepless slide valve control with Vi compensation.

High Efficiency &Energy Saving



Nowadays, the production of water cooled chiller put more attention on lower initial investment rather than lower operation cost, which lead to the descending of heat exchanger performance and declining of COP.
However, Mammoth has its own solution for those wasted energy. Mammoth has focused on energy saving at the very start, keep good performance on every detail. Mammoth MSW chillers are rated in accordance with USA ARI .
The condenser and evaporator of this series are shell and tube type with new high efficiency structure. The heat exchanger adopts the most advanced high efficient copper beams, its special geometrical characteristics enhance vaporizing core for core boiling of outside pipe, strengthen fluid turbulence and postpone water side dust deposit; reinforced heat transfer of inner and outer wall makes the transfer efficiency increased 30% compared with previous design.

Inner groove of evaporator and condenser tube upgrades the transferring efficiency, as well as the evaporating temperature and then improves the unit COP.

The minimum refrigerant flow rate passed on evaporator is 6m/s, which ensures oil self-flow with the refrigerant back to compressor without any compulsive oil return facility, it prevents compressor damage caused by lack oil .

The design, production and inspection of every vessel reach the standard/rules of GB150《Steel Pressure Vessels》, GB151《Tubular heat exchanger》, JB/T4750-2003《Pressure vessels for refrigeration equipment》 and Supervision Regulations On Technology For Stationary Pressure Vessel , safety and reliable work.

Part Load Performance

Compressor is mostly working under part-load condition, unit should work in high efficiency not only in fully but also in part-load condition. It is normal that operation cost has 10%～20% variation due to the partial load under same condition,
The operation energy consumption in part-load condition is vital to unit running cost, and in ARI550 it is measured by Integrated Part Load Value (IPLV) and Application Part Load Value (APLV). IPLV and APLV porovided a standard measurement of part-load operation, so partial load should be defined as normal application rather than special situation.

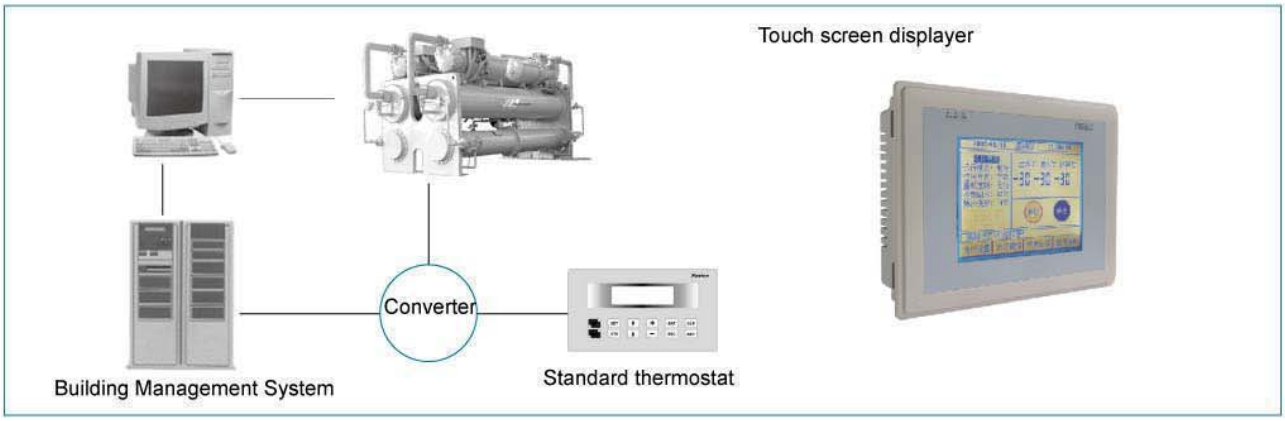
Mammoth screw chiller has been fully considered the economic operation in part-load condition. Utilization of electronic expansion valve improves unit efficiency. Electroinac expansion valve has the technology of PID, which cut down the working cost. The valves integrated with expansion valve motor, ceramic valve plate and valve port wears resistance, has high reliability and long life expectancy. A linear change of water flow, continuously cooling capacity adjustment, make no fluid strike to compressor in cooling circuit. In part-load condition, Electronic expansion valve can create higher accuracy of adjustment, then improves part-load efficiency, and the operation efficiency upgrades 15% compared with thermal expansion valve units, and more accurately controls on chilled water temperature.

Electronic expansion valve	Thermal expansion valve
Valve degree controlled by stepping motor, it's instantaneity	Valve degree controlled by physical balance.
Several seconds cost from full close to full open , prompt reaction, closing and opening and speed are manual settable.	Can not be fully closed, jaw-opening only adjusted by physical balance.
Make accurate adjustment in partial load or condition changed.	Small adjustable range, best performance only in standard condition.

Automatic Control

Electrical control system uses first class electrical components, and there are many automatic protection functions; unit is monitored and managed by microprocessor, and can be linked with water pump & cooling tower, and also can be central controlled through communication port, with the compatibilities of Building Automation System(BAS).
English display,optional can display many working datas, which can fully indicate unit operation status. Optional touch screen displayer.

Compressor working status	Chilled water pump working status	Inlet/outlet water temperature of Chilled water pump	Condenser water pump working status
Inlet/outlet water temperature of condenser water	Working time	Error check etc.	
Accurate control,multiple protections and alarm function assure unit's safety and efficient working, avoid unit damage caused by severe environment or misoperation.			
Permanent power lost memory	Intelligent control of compressor working time under part-load condition	Interlock of pump and blower	
Insufficient chilled water flow	Insufficient condenser water flow	External long distance control switch	
Overload of chilled water pump	Overload of condenser water pump	High pressure	
Low pressure	Compressor overload	Phase protection	
Three phase unbalance protection	Tool low leaving water temperature	Communication error	
Too high condenser leaving water pump			



Easy Installation

Each unit has been fully tested before leaving factory, filled with oil and refrigerant. All protection switches have fully set in factory, and just connect power supply and water pipes at site only.

Widespread Application

Mammoth MSW series are suitable for office building, hotel, restaurant and hospital etc., and offering higher than 5℃ chilled water

If in low temperature mode (optional), the unit can be used for freezing processing, chemical industry and ice storage. Add antifreeze into water system to get -10℃～5℃ chilled water.
In heat recovery mode(optional), it is free to supply domestic water in cooling mode; the domestic hot water temperature ranges from 45℃～65℃ according to different refrigerant. The design of heat exchangers separated condenser water and domestic water, which ensures no water mixture pollution.
If the use marine water as condenser water is the sea water, Cupronickel heat exchanger is a good solution on anticorrosion.

Model Nomenclature

$$\frac{\text{MSW}}{1}\ \frac{065}{2}$$

1.MSW: Mammoth water cooled screw chiller
2.Unit No.

Performance Data 1 R134a

Item \ Model			MSW065	MSW075	MSW085	MSW095	MSW120	MSW140	MSW165	MSW175	MSW210	MSW240
Cooling	Cooling Capacity kW		155	177	213	244	317	358	414	473	543	609
	Cooling Power Input kW		32	37	44	51	66	74	85	97	111	124
	Chilled Water Flow m³/h		27	30	37	42	55	62	71	81	93	105
	Evaporator Pressure Drop kPa		53	54	55	58	60	61	61	62	63	63
	Condenser Water FLow m³/h		32	37	44	51	66	74	86	98	112	126
	Condenser Pressure Drop kPa		40	42	43	44	45	45	46	47	48	48
Total heat recovery heat exchanger (optional)	Heat Recovery Capacity kW		151	172	209	238	311	350	405	462	530	594
	Water Flow m³/h		26	30	36	41	53	60	70	79	91	102
	Water Pressure Drop kPa		38	39	41	42	43	44	44	45	46	46
	Water Pipe Size mm			DN80			DN100			DN125		DN150
Partial heat recovery heat exchanger (optional)	Heat Recovery Capacity kW		23	27	32	37	48	54	62	71	81	91
	Water Flow m³/h		4	5	5	6	8	9	11	12	14	16
	Water Pressure Drop kPa		25	26	28	28	29	31	31	35	38	39
	Water Fitting mm		DN50									
Compressor	Type		Semi-Hermeic Screw									
	Capacity Range %		25~100									
	Power		415V/3N～/50Hz									
	Number		1									
	Start Method		Y-△									
	Full Load Amps A		68	77	92	104	134	148	172	194	221	240
	Start Current A	circuit 1(Y/△)	180/539	180/539	235/706	220/660	248/743	287/861	406/1219	406/1219	459/1376	549/1648
		circuit 2(Y/△)	/	/	/	/	/	/	/	/	/	/
		circuit 3(Y/△)	/	/	/	/	/	/	/	/	/	/
		circuit 4(Y/△)	/	/	/	/	/	/	/	/	/	/
Running Control			Digital control,Micro computer control									
Protection			HP/LP、Anti-freeze、Flow etc									
Chilled Water Pipe Size mm			DN80			DN100			DN125			DN150
Condenser Water Pipe Size mm			DN80			DN100			DN125			DN150
R134aCharge kg			35	40	50	55	75	80	100	110	120	135
Refrigerant Oil Charge L			19	19	17	26	26	26	28	28	38	38
Dimension	Length mm		3300	3300	3300	3300	3300	3300	3300	3350	3350	3600
	Width mm		1200	1250	1300	1300	1300	1300	1300	1350	1400	1500
	Height mm		1800	1850	1900	1950	2050	2050	2050	2100	2150	2150
Net Weight kg			1490	1590	1810	2040	2260	2220	2790	3070	3330	3730
Operating Weight kg			1710	1850	2090	2340	2590	2680	3190	3610	3930	4150

NOTES:

1.Standard design pressure for water system is 1.0Mpa.

2.Under standard cooling operating condition,condenser water inlet/outlet temp. is 30/35℃， load water inlet/outlet temp. is 12/7℃.

3.Under heat recovery operating condition, evaporation inlet water temp. is 12℃,domestic hot water inlet/outlet is 55/60℃ partial heat recovery domestic hot water inlet/outlet is 55/60℃ .

4.Mammoth is committed to a policy of continuous product improvements, and reserves the rights to revise specification and design without further notice.

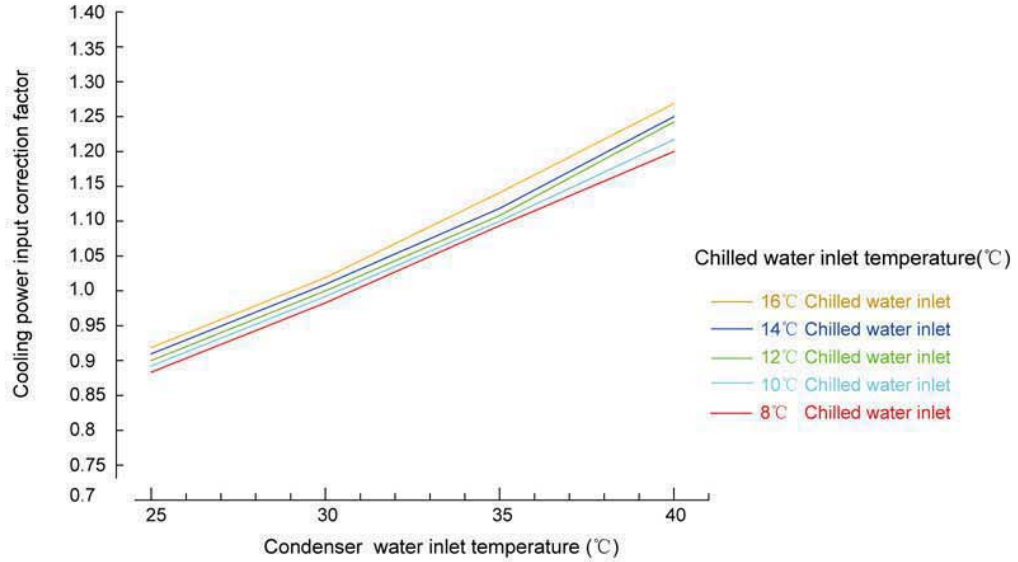
Performance Data 2 R134a

Item		Model	MSW295	MSW395	MSW420	MSW460	MSW550	MSW710	MSW760	MSW820	MSW860	MSW960
Cooling	Cooling Capacity kW		717	829	946	1086	1218	1419	1630	1892	2173	2437
	Cooling Power Input kW		148	170	194	222	248	291	333	388	444	496
	Chilled Water Flow m³/h		123	143	163	187	209	244	280	325	374	419
	Evaporator Pressure Drop kPa		65	65	66	67	67	70	72	75	76	77
	Condenser Water FLow m³/h		149	172	196	225	252	294	344	392	450	504
	Condenser Pressure Drop kPa		50	51	52	55	56	60	63	64	65	68
Total heat recovery heat exchanger (optional)	Heat Recovery Capacity kW		700	810	924	1060	1188	1386	1590	1848	2120	2376
	Water Pipe Size m³/h		120	139	159	182	204	238	273	318	365	409
	Water Pressure Drop kPa		48	50	50	52	54	56	58	60	63	64
	Water Pipe Size mm		DN150				DN200	DN200		DN250		
Partial heat recovery heat exchanger (optional)	Heat Recovery Capacity kW		108	124	142	163	183	213	245	284	326	366
	Water Flow m³/h		18	21	24	28	31	37	42	49	56	63
	Water Pressure Drop kPa		40	41	42	43	45	45	46	47	47	48
	Water Pipe Size mm		2*DN50		2*DN65			3*DN65		2*DN80		
Compressor	Type		Semi-Hermeic Screw									
	Capacity Range %		12.5~100					8.3~100		6.25~100		
	Power		415V/3N～/50Hz									
	Number		2					3		4		
	Start Method		Y-△									
	Full Load Amps A		296	344	388	442	480	582	663	776	884	960
	Start Current A	circuit 1(Y/△)	287/861	406/1219	406/1219	459/1376	549/1648	406/1219	459/1376	406/1219	459/1376	549/1648
		circuit 2(Y/△)	287/861	406/1219	406/1219	459/1376	549/1648	406/1219	459/1376	406/1219	459/1376	549/1648
		circuit 3(Y/△)	/	/	/	/	/	406/1219	459/1376	406/1219	459/1376	549/1648
		circuit 4(Y/△)	/	/	/	/	/	/	/	406/1219	459/1376	549/1648
Running Control			Digital control,Micro computer control									
Protection			HP/LP、Anti-freeze、Flow etc									
Chilled water Pipe Size mm			DN150		DN150		DN200	DN200		DN250		
Condenser water pipe size mm			2*DN100		2*DN125		2*DN150	3*DN125		2*DN200		
R134aCharge kg			160	200	220	240	270	330	360	440	480	540
Refrigerant oil charge L			2*26	2*28	2*28	2*38	2*38	3*28	3*38	4*28	4*38	4*38
Dimension	Length mm		4400	5150	5150	5300	5300	5600	5600	5700	5850	5850
	Width mm		1650	1700	1750	1800	1800	2450	2450	2550	2600	2600
	Height mm		2350	2400	2450	2450	2450	2500	2500	3100	3100	3100
Net Weight kg			4560	5610	5880	6810	8130	8300	8750	11500	11950	12050
Operating Weight kg			5360	6490	6890	7760	9230	9500	10050	13000	13550	13700

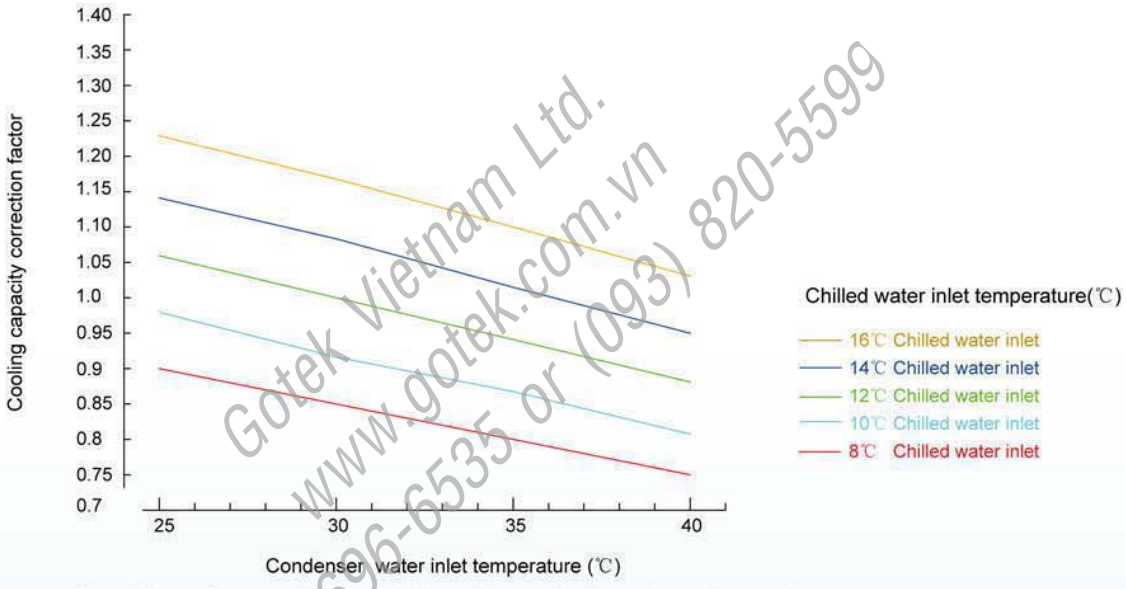
NOTES:

1. Standard design pressure for water system is 1.0Mpa.
2. Under standard cooling operating condition,condenser water inlet/outlet temp. is 30/35℃, load water inlet/outlet temp. is 12/7℃.
3. Under heat recovery operating condition ,evaporation inlet water temp. is 12℃,domestic hot water inlet/outlet is 55/60℃, partial heat recovery domestic hot water inlet/outlet is 55/60℃.
4. Mammoth is committed to a policy of continuous product improvements, and reserves the rights to revise specification and design without further notice.

MSW water cooled screw chiller working condition rectified correction curve.



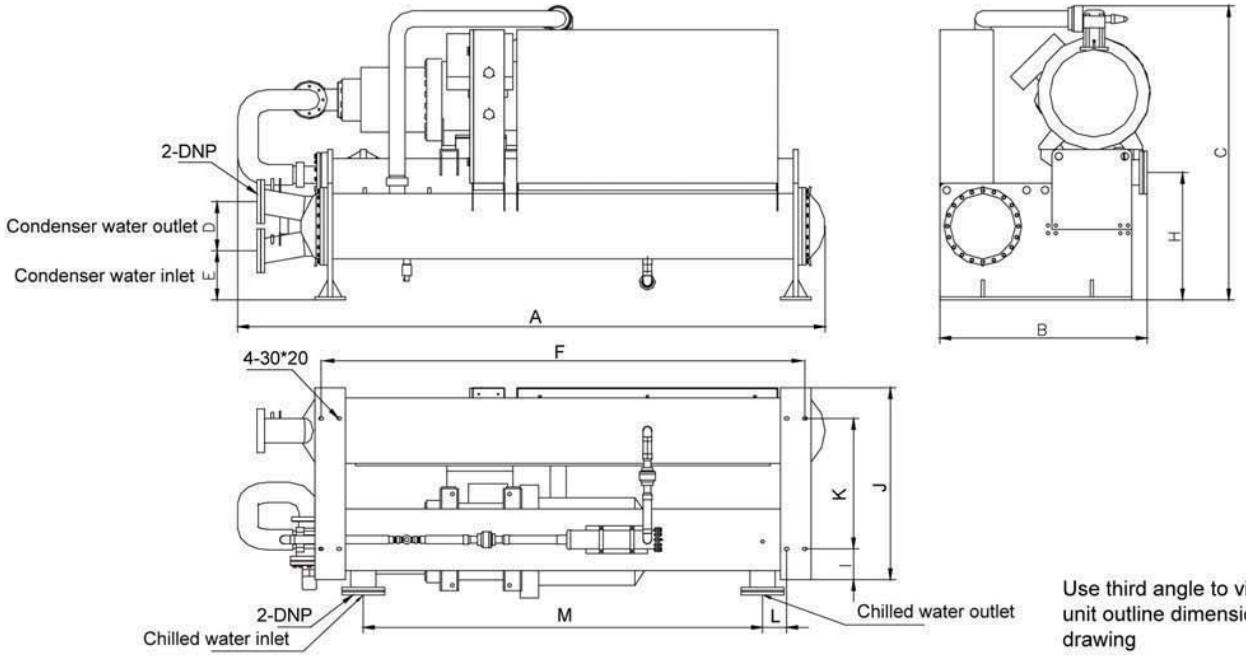
Note: The cooling power factor is 1 in cooling mode of normal working condition.



Note: The cooling capability factor is 1 in cooling mode of normal working condition.

Note: 1. The data is for reference only, the real data will be slightly different if compressor or working condition changed.
2. The data is obtained from actual compressor type.
3. The correction data can not be out of compressor operation range.

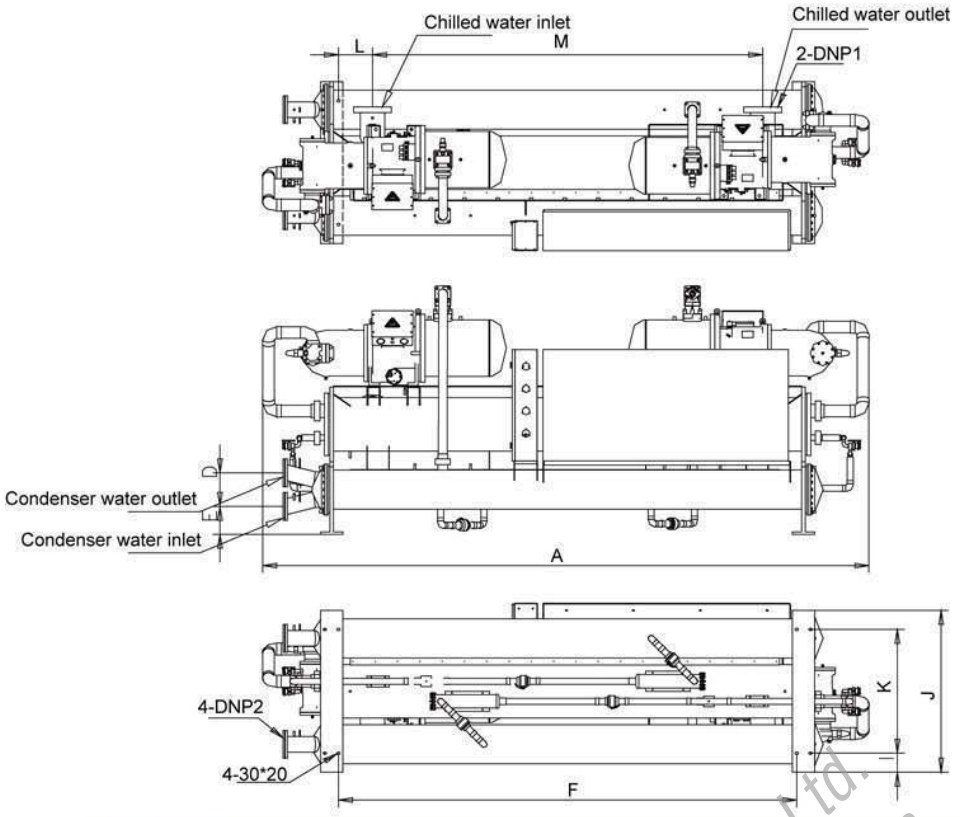
Unit outline dimension drawing
MSW065~240



Use third angle to view unit outline dimension drawing

Model \ Dimension	A	B	C	D	E	F	H	I	J	K	L	M	P
MSW065	3300	1200	1800	230	255	2557	700	220	1140	800	85	2150	80
MSW075	3300	1250	1850	250	245	2557	715	220	1140	800	85	2150	80
MSW085	3300	1300	1900	270	260	2557	790	170	1140	800	85	2150	80
MSW095	3300	1300	1950	300	260	2557	790	170	1140	800	85	2150	100
MSW120	3300	1300	2050	300	270	2557	800	170	1140	800	85	2150	100
MSW140	3300	1300	2050	300	270	2557	900	170	1140	800	85	2150	100
MSW165	3300	1300	2050	300	270	2557	900	170	1140	800	85	2150	125
MSW175	3350	1350	2100	300	270	2557	950	170	1140	800	85	2150	125
MSW210	3350	1400	2150	320	300	2557	950	170	1140	800	85	2150	125
MSW240	3600	1500	2150	320	320	2557	960	170	1140	800	85	2150	150

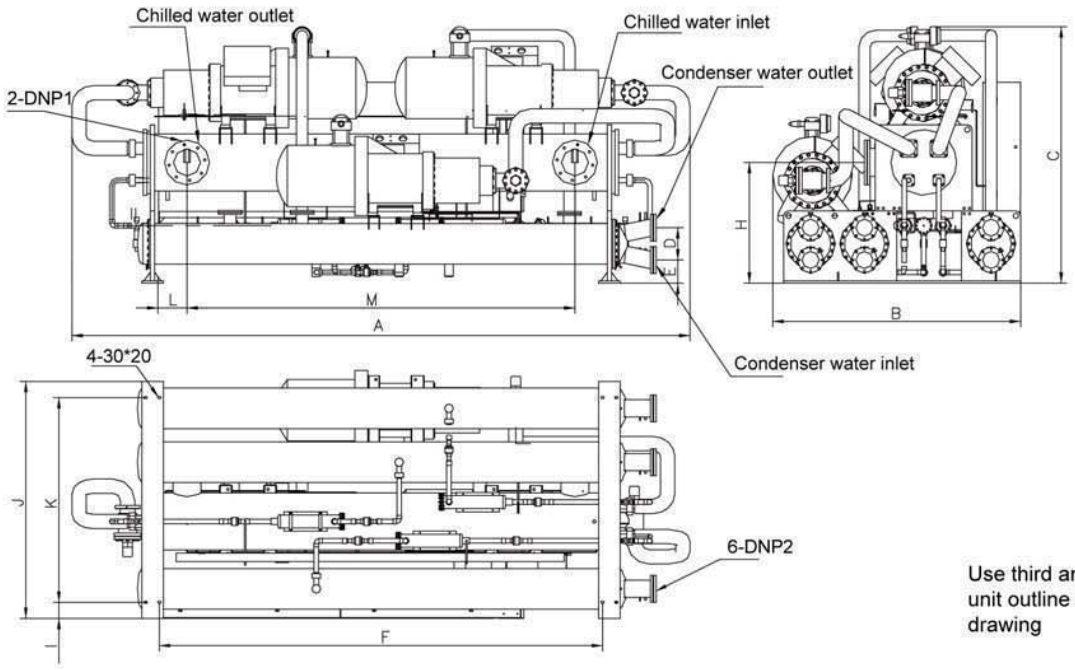
Unit outline dimension drawing
MSW295~550



Use third angle to view unit outline dimension drawing

Dimension / Model	A	B	C	D	E	F	H	I	J	K	L	M	P1(load side)	P2(Cooling side)
MSW295	4400	1650	2350	300	280	2640	1200	150	1540	1250	120	2400	150	2*100
MSW395	5150	1700	2400	300	250	3640	1150	110	1470	1250	120	3400	150	2*100
MSW420	5150	1750	2450	320	250	3640	1150	110	1470	1250	120	3400	150	2*125
MSW460	5300	1800	2450	320	250	3640	1150	110	1470	1250	120	3400	150	2*125
MSW550	5300	1800	2450	320	250	3640	1150	110	1470	1250	120	3400	200	2*150

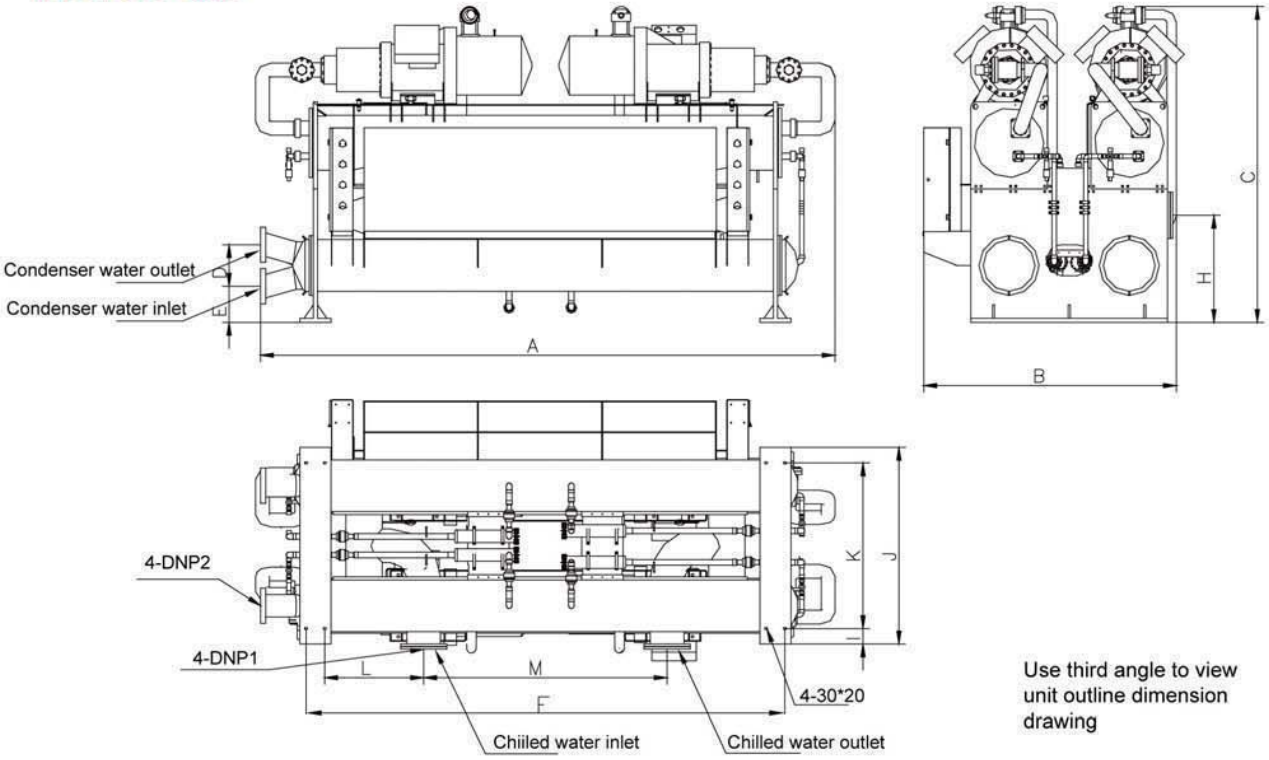
Unit outline dimension drawing
MSW710~760



Use third angle to view unit outline dimension drawing

Dimension / Model	A	B	C	D	E	F	H	I	J	K	L	M	P1(load side)	P2(Cooling side)
MSW710	5600	2450	2550	310	215	4012	1200	150	2200	1900	170	3650	200	3*125
MSW760	5600	2450	2550	320	205	4012	1250	150	2300	2000	180	3650	200	3*125

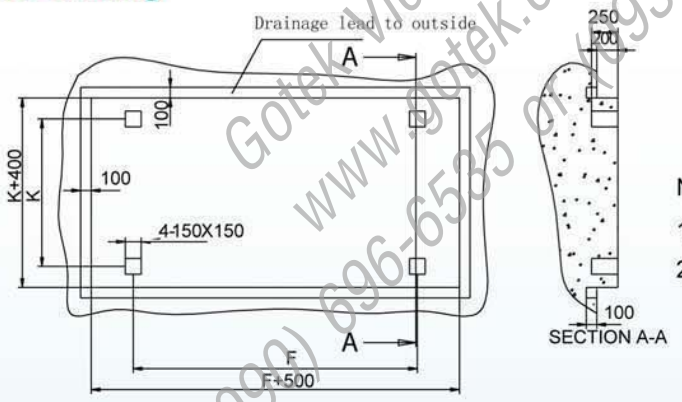
Unit outline dimension drawing
MSW820~960



Use third angle to view unit outline dimension drawing

Dimension / Model	A	B	C	D	E	F	H	I	J	K	L	M	P1(load side)	P2(Cooling side)
MSW820	5700	2550	3100	400	350	4490	1035	150	1900	1600	845	2405	250	2*200
MSW860	5850	2600	3100	400	350	4490	1035	150	1900	1600	845	2405	250	2*200
MSW960	5850	2600	3100	400	350	4490	1035	150	1900	1600	845	2405	250	2*200

Installation base drawing



Notes

1.Mammoth recommend M16 embedded bolt

2.Relevant rubber gasket fixed for shock absorbing.(300*200*10)

Model Nomenclature

B D F
1 2 3

1：Refrigerant：C-R22, A-R134a ,B-R407C

2：Unit No

3：F: Full heat recovery R: Partial heat recovery L: Low temperature ice storage
N: Cupronickel heat exchanger, omit if unavailable.

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ISO9001 ISO14001 OHSAS18001

Due to continuous product improvements, we reserve the right to change design and specifications without notice.

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