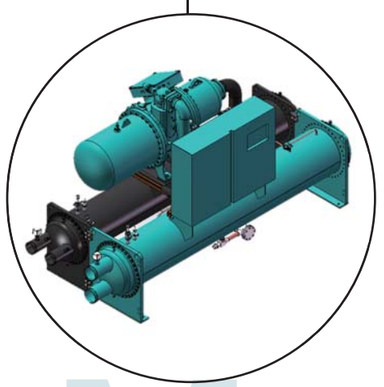
Mammoth
The Leader In Custom HVAC & Energy Saving

E-tech

Water-Cooled Screw Chillers

Water-To-Water Screw Chiller/Heat Pump (**Flooded**)
(**Thunderbolt Series**, HFC-134a, Multiple Applications)



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ISO9001 ISO14001 OHSAS18001

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Mammoth dedicates to continuous improvement of products
and unit parameters are subject to change without notice.

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Mammoth®
The Leader In Custom HVAC & Energy Saving

In 1988, American Mammoth formally entered Chinese market through commercial activities. In 2002, Mammoth invested ten million US Dollars as a sole investor, took Mammoth China Group as a carrier, carefully selected superior products of the Group and integrated these products into its brand with the aim to enter the central air conditioner market of China in an all-round way. In Shanghai, the economic and cultural center of China,

Mammoth produces air conditioning equipment that leverages energy saving and innovative technologies.Our products include,but not limited to geothermal & water source heat pumps, air & water cooled commercial air conditioning units, fan coils, AHU, VAV box, screw chillers, and energy recovery units.

- Domestically largest water-ring heat pump system - ---- Nanjing International Trade City
- Domestically most energy-efficient ground-source heat pump system ----- Shanghai Pujiang Zhigu Business Park
- Domestically earliest water-ring heat pump system ----- Shanghai ITONKIN Department Building
- Domestically largest sewage-source centralized heating system ----- Shijiazhuang Zhongmeicheng

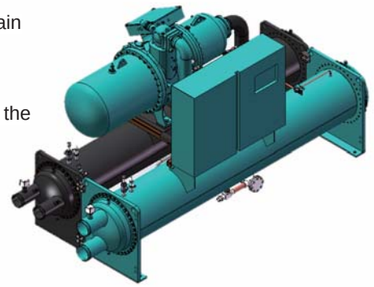
Energy-efficient Air Conditioner Integrated Solutions:

- Improvement for energy conservation
- Substitution of boiler
- Agricultural cooling and heating systems
- Industrial cooling and heating systems
- District centralized heating system
- Large temperature-difference & small flow system
- Water-ring/water-source/ground-source heat pump systems
- Lake water/sea water/sewage-source heat pump systems

“

American Mammoth Group was founded in Minnesota, USA in 1935. With advanced technologies and professional product quality, it can provide various customized and energy-efficient air conditioning products as per global users’ demands in different fields.

Thunderbolt series high-efficiency water cooled screw chiller (heat pump) is the main product of Mammoth company, it utilizes Mammoth screw compressor and flooded type heat exchangers, incorporated with newly developed CMC800 touch screen controller. Thunderbolt series have full capacity range with multiple options to meet the various customer's demands. The applications could be comfort air conditioning, heat pump, ice storage, A/C with heat recovery, refrigeration, ice storage with heat recovery and refrigeration with heat recovery. The highest leaving heat recovery hot water temperature can be 65C.



Unit Features

Environmental Friendly & High Efficiency

- The whole series products are designed to meet energy saving requirement applied for green buildings or LEED certification projects.
- The Semi-Hermetic screw compressor with twin slide valves is specially designed for enviromental friendly refrigerant HFC-134a.
- High efficiency flooded type evaporator.
- Utilizing automatic refrigerant flow control and discharge gas superheat degree control to achieve higher working efficiency.
- Electronic expansion valve for high efficiency under variable working conditions.

Multiple Applications

- There are applications such as comfort air conditioning, heat pump & refrigeration etc, and it is able to recover heat at the same time. The highest leaving water is 65 ℃.
- Unit is designed to meet with energy saving system as cold air distribution, large temperature difference with low flow rate, Variable Primary Flow and Independent temperature & humidity control and so on.
- The capacity control range of 12.5%~100% is realized by stepless slide valve .
- Condenser leaving water temperature ranges from 18℃ through 65℃, and evaporator leaving water temperature rangs from -12℃ through 18℃.

Stable Operation

- High precision screw rotor machining (KAPP) has long operating lifespan.
- Comprehensive protections and restriction functions ensure stable, reliable and efficient operation.
- High efficient pressure differential oil return and injection oil return technology.
- All units are factory tested.
- Patented compressor and motor cooling techniques, incorporated with professional regulation technology, to ensure unit stable working under big temperature difference or for high temperature application.

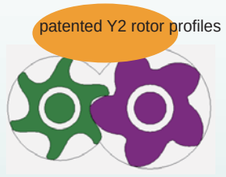
Easy Operating and Maintenance

- Color touch screen with menu management interface, easy to operate according to the instructions.
- Microprocessor control, load adjustment and safety protections are completely and automatically done by computer.
- Rich control functions, alarm information and storage functions are provided for end user to know the unit oeration status in time;
- Unit is designed with automatic pump empty function for maintenance.

Component Features

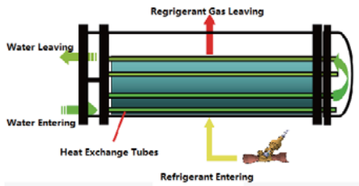
Compressor

- Patented Y2 rotor profiles.
- Motor is directly driven and is cooled by suction gas.
- Yin-Yang screw driven design incorporated with semi-dry screw technology, little circulating oil quantity is required.
- The axial and radial exhaust orifice and end face economizer orifice are used to further improve the compressor efficiency.



Heat Exchanger

- Utilizing flooded type heat exchanger to get high heat transfer efficiency.
- Less refrigerant charge.
- Unique design to place oil return port at ample oil position, to get high oil return efficiency and more reliable operation.
- Utilizing both inner and outer strengthened high efficiency heat exchange tubes to reduce energy consumption.

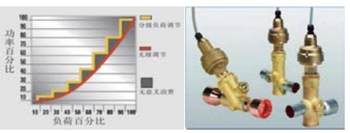


Oil Separator & Oil Return

- Utilizing condenser built-in secondary oil separator, with simple structure, smaller size to achieve, efficiency >99.95%.
- Utilizing pressure differential oil return to improve the heat transfer performance of evaporator.
- Auxiliary injection oil return technology was adopted to improve the oil return and heat exchange performance.

Throttle Device

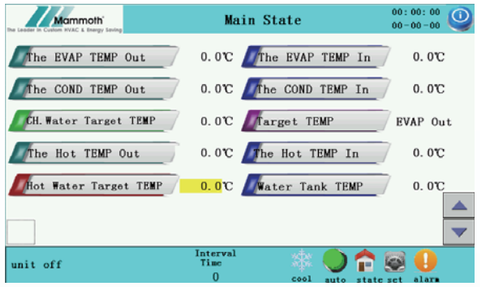
- Utilizing electronic expansion valve to realize the responsive throttling control.
- Startup self-checking function to ensure safe and reliable operation.



System Control

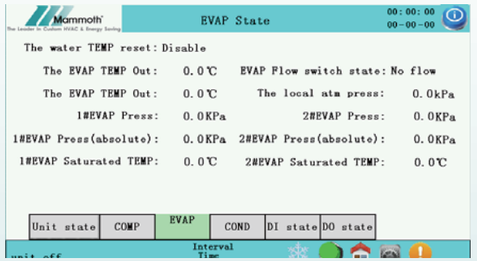
CMC800™ Controller

CMC800™ controller is the latest intelligent control system developled by Mammoth independently, has powerful protection and diagnosis functions; the optimized PID control operation, effectively maintain the stable water temperature.



Automatic Leaving Water Temperature Control

1. Leaving water temperature setting function;
2. Soft water temperature loading to reach stable water leaving temperature quickly;
3. Soft current loading to maintain stable water temperature;
4. PID capacity control automatically adapt to various working conditions to meet the demand of different load quickly and stably;
5. Quick compressor startup to meet load requirement.



Product Introduction

Unit Automatic Operation Functions

1. CMC800™ controller is capable of controlling the unit startup, operation, protection and alarming automatically.

2. Reliable auto-start function.

3. Programmable operation schedule.

4. Multi-source On/Off input available: Local-Remote-BAS.

Startup Method and Automatic Balance

1. Standard delta step-down start to minimize the impact on power grid and peripheral devices.

2. Optional soft start, to meet higher startup requirement.

3. Automatic sequencing of system running time to achieve the average wear.

4. Automatic loop to achieve stable water temperature.

Operational Safety Management

1. Three password management: User, Service and Plant.

2. Real-time running status detection and display.

3. Oil preheating and reminder.

Advanced Control Technology

1. Multi-loop PID control: Capacity, current, discharge superheat degree.

2. Discharge superheat degree control to ensure effective working at anytime.

3. Reliable automatic pump empty control, easy for service and maintenance.

4. Effective parameter setting meet with all kinds of application requirements.

Powerful Hardware Status Diagnosis

1. Temperature & pressure sensor failure detection.

2. The controller failure detection.

3. Power control contactor failure detection.

Innovative Preventive Restriction Control

1. Current preventive restriction control utilized to prevent compressor from overload.

2. Discharge temperature preventive restriction control to prevent compressor from high discharge temperature.

3. Condensing pressure preventive restriction control to prevent downtime from excessive load.

4. Low evaporating temperature preventive restriction control to avoid downtime from too low load.

Optional Group Control

1. RS485 communication port, easy access to the integrated control system or building automation system.

2. Standard MODbus communication protocol.

3. Remote detection, control and diagnosis function.

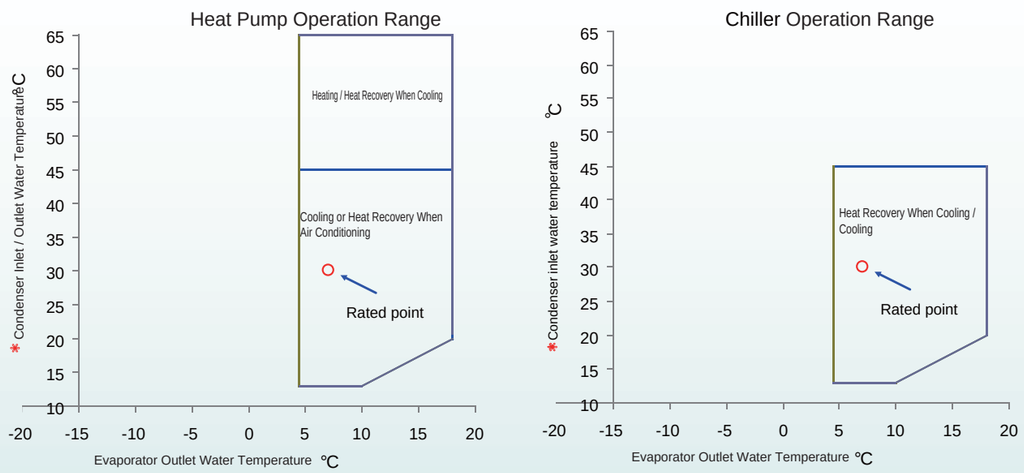
Comprehensive Protection Alarm Functions

1. Multiple antifreeze protection; 2. Low leaving water temp protection; 3. Water flow loss protection; 4. Evaporating temperature protection;

5. Evaporating pressure protection; 6. Discharge temperature protection; 7. Condensing pressure protection; 8.Oil level protection;

9. Refrigerant differential pressure protection; 10.Power supply phase protection, 11.Over-current protection; 12.Contactor adhesions protection alarm.

Unit Operation Range



Note: *temperatures lower than 45℃ are for condenser entering water, temperatures higher than 45℃ are for condenser leaving water.

Nomenclature

Basic Model Segment		Main Feature Segment	Secondary Feature Segment
MCRH	0400	CMSN	T
1~4	2~8	9~12	13

Basic Model Segment

No.1~4 Type

MCRH: Mammoth WTW series screw heat pump

No.2～8 Model

0070	0200
0080	0240
0090	0260
0100	0280
0120	0295
0140	0320
0160	0360
0180	0400
0220	0450
0270	0500
0300	0550
0170	0600

Main Feature Segment

No.9 Application Type
- C: GB/T18430.1 single water cool condition;
- I: Industrial cold water （-15℃）
- F: Industrial chilled water（-30℃）
- W: GB19409 Water Loop;
- G: GB19409 Ground Loop;
- U: GB19409 Ground Water;
- H: High Temperature Heat Pump

No.10 Heat exchanger type
- G: Dry type
- J: Falling film type（Note: Hero series）
- M: Flooded type（Note: Thunderbolt series）

No.11 Efficiency
- S: Standard
- P: High
- E: Economical

No.12 Heat Recovery
- N: N/A;
- A: Full heat recovery.

No.13 Configuration
- T: Standard
- F: Customized

【Note】See below factory default options, If there is any different requirements, please clarify when ordering.

Vessel type : GB Standard
Language : Chinese
Pipe Connection: Flange
Safety Valve : Single safety valve
Water Direction : Left in & Left out for evaporator and condenser
Water Pressure: 1.0MPa
Compressor Startup Method : Y-△
Remote Control: MODBUS
Package : Rubber pad;
: packed by plastic bag, without wooden box
Flow switch : 2 pcs Target flow switches
Noise Reduction : N/A

Chiller Technical Specification

Item		Model	MCRH 0070	MCRH 0080	MCRH 0090	MCRH 0100	MCRH 0120	MCRH 0140	MCRH 0160	MCRH 0180	MCRH 0220	MCRH 0270	MCRH 0300	MCRH 0170
Cooling Capacity	kW		223.4	254.7	292.9	332.6	374.3	433.5	494.0	567.8	636.6	794.6	914.3	585.9
	10^4kCal/h		19	22	25	29	32	37	42	49	55	68	79	50
Power Input（kW）			41.7	47.5	54.6	61.8	69.3	80.0	90.9	103.2	115.3	143.5	165.1	108.1
COP(W/W)			5.36	5.36	5.37	5.38	5.40	5.42	5.43	5.50	5.52	5.54	5.54	5.42
Compressor	Starting Method		Y-△											
	Capacity Control		25～100% stepless control											12.5%～100% (stepless)
	Power Supply		380V/3N～/50Hz											
	QTY		1											2
	Rated Current (A)		75	85	97	109	122	139	158	179	199	247	284	194
	Max Current (A)		104	118	135	152	169	194	220	250	278	344	396	270
Protections			HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type		R134a											
	Charge (kg)		75	84	95	105	126	147	168	190	232	284	315	220
Evaporator	Water Flow（m^3/h）		38	44	50	57	64	75	85	98	110	137	157	101
	Pressure Drop（kPa）		48	50	50	51	53	55	63	65	65	64	65	63
	Pipe Diameter（mm）		108	108	108	108	108	108	133	133	159	159	159	159
	Pipe Connection		Clamp											
Condenser	Water Flow（m^3/h）		48	55	66	72	80	93	106	122	137	171	197	126
	Pressure Drop（kPa）		52	54	55	55	56	57	67	68	69	69	70	70
	Pipe Diameter（mm）		108	108	133	133	133	133	159	159	159	159	219	159
	Pipe Connection		Clamp											
Dimensions	Length（mm）		3100	3100	3100	3100	3100	3100	3700	3700	3700	3700	3700	4950
	Width（mm）		1400	1400	1450	1450	1500	1500	1550	1550	1750	1750	1750	1600
	Height（mm）		1750	1750	1800	1800	1900	1900	1950	1950	2150	2150	2150	2100
Shipping weight（kg）			2405	2680	2890	3040	3175	3630	3750	3995	4305	5025	5250	4965
Operating Weight（kg）			2525	2810	3090	3250	3400	3880	4030	4300	4660	5425	5710	5345

Notes:

1. Capacities above are based on 7℃ leaving evaporator water with water flow equals cooling capacity * 0.172m³/(h*kW), and 30℃ entering condenser water with water flow equals cooling capacity * 0.215m³/(h*kW);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information;

Chiller Technical Specification

Item		Model	MCRH 0200	MCRH 0240	MCRH 0260	MCRH 0280	MCRH 0295	MCRH 0320	MCRH 0360	MCRH 0400	MCRH 0450	MCRH 0500	MCRH 0550	MCRH 0600
Cooling Capacity	kW		665.2	748.7	866.9	927.5	988.0	1061.8	1135.5	1273.3	1431.2	1589.2	1708.8	1828.5
	10^4kCal/h		57	64	75	80	85	91	98	110	123	137	147	157
Power Input（kW）			122.4	137.3	158.5	169.3	180.1	193.2	204.3	228.4	256.2	284.1	305.5	326.9
COP (W/W)			5.43	5.45	5.47	5.48	5.49	5.50	5.56	5.57	5.59	5.59	5.59	5.59
Compressor	Starting Method		Y-△											
	Capacity Control		12.5%～100% stepless control											
	Power Supply		380V/3N～/50Hz											
	QTY		2											
	Rated Current (A)		218	243	279	297	315	337	359	399	446	493	531	568
	Max Current（A）		304	339	389	414	439	470	500	556	622	688	740	792
Protections			HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type		R134a											
	Charge (kg)		240	270	290	320	340	346	380	400	450	480	500	540
Evaporator	Water Flow（m^3/h）		114	129	149	160	170	191	195	219	246	273	294	315
	Pressure Drop（kPa）		65	66	65	66	66	66	67	67	69	68	70	71
	Pipe Diameter（mm）		159	159	159	219	219	219	219	219	219	219	219	273
	Pipe Connection		Clamp											
Condenser	Water Flow（m^3/h）		143	161	186	199	212	228	244	274	308	342	367	393
	Pressure Drop（kPa）		71	72	72	73	72	71	71	72	73	73	74	75
	Pipe Diameter（mm）		159	159	159	159	219	219	219	219	219	273	273	273
	Pipe Connection		Clamp											
Dimensions	Length（mm）		4950	4950	5000	5000	5000	5000	5000	5150	5200	5500	5500	5500
	Width（mm）		1600	1600	1650	1650	1650	1650	1650	1800	1900	1950	1950	1950
	Height（mm）		2100	2100	2150	2150	2150	2150	2150	2250	2300	2300	2300	2300
Shipping weight（kg）			5300	5445	6310	6725	6890	7140	7395	7750	8780	9665	9845	10330
Running Weight（kg）			5720	5925	6800	7250	7485	7830	8115	8530	9630	10625	10875	11635

Notes:

1. Capacities above are based on 7℃ leaving evaporator water with water flow equals cooling capacity * 0.172m³/(h*kW), and 30℃ entering condenser water with water flow equals cooling capacity * 0.215m³/(h*kW);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information;

Ground Water Heat Pump Technical Specification

Item \ Model		MCRH 0070	MCRH 0080	MCRH 0090	MCRH 0100	MCRH 0120	MCRH 0140	MCRH 0160	MCRH 0180	MCRH 0220	MCRH 0270	MCRH 0300	MCRH 0170
Cooling Capacity	kW	242.1	276.1	317.6	360.6	405.8	470.0	535.6	615.5	690.2	861.5	991.2	635.2
	10^4kCal/h	21	24	27	31	35	40	46	53	59	74	85	55
Power input（kW）		36.5	41.6	47.8	54.1	60.7	70.1	79.6	91.2	101.9	126.8	145.9	95.6
EER (W/W)		6.64	6.64	6.65	6.67	6.69	6.71	6.73	6.75	6.77	6.79	6.79	6.65
Heating Capacity	kW	257.0	292.9	336.9	382.3	430.0	497.6	566.6	650.8	729.2	909.5	1046.5	673.9
	10^4kCal/h	22	25	29	33	37	43	49	56	63	78	90	58
Power input（kW）		53.8	61.3	70.5	79.8	89.5	103.3	117.4	134.5	150.3	187.0	215.2	140.9
COP (W/W)		4.78	4.78	4.78	4.79	4.80	4.82	4.83	4.84	4.85	4.86	4.86	4.78
Compressor	Starting Method	Y-△											
	Capacity Control	25%～100% stepless control											12.5%～100% (stepless)
	Power Supply	380V/3N～/50Hz											
	QTY	1											2
	Cooling Rated Current(A)	64	73	83	94	104	120	135	154	171	212	244	166
	Heating Rated Current(A)	97	109	125	141	157	180	203	232	257	318	366	250
	Max Current(A)	150	170	194	219	244	275	310	360	400	495	569	389
Protections		HP, LP, High Exhaust Temperature, Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type	R134a											
	Charge (kg)	75	84	95	105	126	147	168	190	232	284	315	220
Evaporator	Cooling Water Flow（m³/h）	42	47	55	62	70	81	92	106	119	148	170	109
	Cooling Pressure Drop（kPa）	53	55	56	56	57	58	68	69	70	70	71	71
	Heating Water Flow（m³/h）	25	28	33	37	42	48	55	63	71	89	102	65
	Heating Pressure Drop（kPa）	31	33	34	33	35	35	36	37	38	40	39	40
	Pipe Diameter（mm）	108	108	108	108	108	108	133	133	159	159	159	159
	Pipe Connection	Clamp											
Condenser	Cooling Water Flow（m³/h）	25	28	33	37	42	48	55	63	71	89	102	65
	Cooling Pressure Drop（kPa）	25	26	28	30	32	33	34	34	36	36	36	37
	Heating Water Flow（m³/h）	42	47	55	62	70	81	92	106	119	148	170	109
	Heating Pressure Drop（kPa）	49	50	51	51	52	53	53	54	55	55	56	56
	Pipe Diameter（mm）	108	108	133	133	133	133	159	159	159	159	219	159
	Pipe Connection	Clamp											
Dimensions	Length（mm）	3100	3100	3100	3100	3100	3100	3700	3700	3700	3700	3700	4950
	Width（mm）	1400	1400	1450	1450	1500	1500	1550	1550	1750	1750	1750	1600
	Height（mm）	1750	1750	1800	1800	1900	1900	1950	1950	2150	2150	2150	2100
Shipping weight（kg）		2405	2680	2890	3040	3175	3630	3750	3995	4305	5025	5250	4965
Operating Weight（kg）		2525	2810	3090	3250	3400	3880	4030	4300	4660	5425	5710	5345

Notes:

1. Capacities above are based on:
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 18℃ entering source water with water flow equals cooling capacity * 0.103m³/(h*kw);
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 15℃ entering source water with water flow equals cooling capacity * 0.103m³/（h*kw);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃;
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

Ground Water Heat Pump Technical Specification

Item \ Model		MCRH 0200	MCRH 0240	MCRH 0260	MCRH 0280	MCRH 0295	MCRH 0320	MCRH 0360	MCRH 0400	MCRH 0450	MCRH 0500	MCRH 0550	MCRH 0600
Cooling Capacity	kW	721.2	811.7	939.9	1005.6	1071.2	1151.1	1231.1	1380.5	1551.7	1722.9	1852.7	1982.4
	10^4kCal/h	62	70	81	86	92	99	106	119	133	148	159	170
Power input（kW）		108.2	121.4	140.1	149.7	159.2	170.8	182.4	203.9	228.8	253.7	272.8	291.9
EER (W/W)		6.67	6.69	6.71	6.72	6.73	6.74	6.75	6.77	6.78	6.79	6.79	6.79
Heating Capacity	kW	764.6	859.9	995.1	1064.2	1133.3	1217.4	1301.6	1458.5	1638.8	1819.1	1956.1	2093.1
	10^4kCal/h	66	74	86	92	97	105	112	125	141	156	168	180
Power input（kW）		159.5	179.0	206.6	220.7	234.7	251.8	268.9	300.6	337.3	374.0	402.2	430.4
COP (W/W)		4.79	4.80	4.82	4.82	4.83	4.83	4.84	4.85	4.86	4.86	4.86	4.86
Compressor	Starting Method	Y-△											
	Capacity Control	12.5%～100% stepless control											
	Power Supply	380V/3N～/50Hz											
	QTY	2											
	Cooling Rated Current (A)	187	209	239	255	270	289	308	342	383	424	455	487
	Heating Rated Current (A)	281	314	360	383	407	435	463	515	576	637	685	733
	Max Current (A)	437	488	550	584	619	670	720	800	895	990	1064	1139
Protections		HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type	R134a											
	Charge (kg)	240	270	290	320	340	346	380	400	450	480	500	540
Evaporator	Cooling Water Flow（m³/h）	124	140	162	173	184	198	212	237	267	296	319	341
	Cooling Pressure Drop（kPa）	72	73	73	74	73	72	72	73	74	74	75	76
	Heating Water Flow（m³/h）	74	84	97	104	110	119	127	142	160	177	191	204
	Heating Pressure Drop（kPa）	40	41	42	43	43	44	45	45	46	46	47	48
	Pipe Diameter（mm）	159	159	159	219	219	219	219	219	219	219	219	273
	Pipe Connection	Clamp											
Condenser	Cooling Water Flow（m³/h）	74	84	97	104	110	119	127	142	160	177	191	204
	Cooling Pressure Drop（kPa）	36	37	39	41	41	42	43	43	44	26	26	26
	Heating Water Flow（m³/h）	124	140	162	173	184	198	212	237	267	296	319	341
	Heating Pressure Drop（kPa）	57	58	58	59	57	57	58	58	59	59	59	60
	Pipe Diameter（mm）	159	159	159	159	219	219	219	219	219	273	273	273
	Pipe Connection	Clamp											
Dimensions	Length（mm）	4950	4950	5000	5000	5000	5000	5000	5150	5200	5500	5500	5500
	Width（mm）	1600	1600	1650	1650	1650	1650	1650	1800	1900	1950	1950	1950
	Height（mm）	2100	2100	2150	2150	2150	2150	2150	2250	2300	2300	2300	2300
Shipping weight（kg）		5300	5445	6310	6725	6890	7140	7395	7750	8780	9665	9845	10330
Operating Weight（kg）		5720	5925	6800	7250	7485	7830	8115	8530	9630	10625	10875	11635

Notes:

1. Capacities above are based on:
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 18℃ entering source water with water flow equals cooling capacity * 0.103m³/(h*kw);
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 15℃ entering source water with water flow equals cooling capacity * 0.103m³/（h*kw);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃;
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

Ground Loop Heat Pump Technical Specification

Item		Model	MCRH 0070	MCRH 0080	MCRH 0090	MCRH 0100	MCRH 0120	MCRH 0140	MCRH 0160	MCRH 0180	MCRH 0220	MCRH 0270	MCRH 0300	MCRH 0170
Cooling Capacity		kW	239.3	272.8	313.8	356.3	401.0	464.3	529.2	608.2	682.0	851.2	979.4	627.6
		10^4kCal/h	21	23	27	31	34	40	46	52	59	73	84	54
Power Input（kW）			37.6	42.9	49.3	55.8	62.6	72.3	82.1	94.1	105.2	130.8	150.6	98.6
EER		(W/W)	6.36	6.36	6.37	6.39	6.41	6.43	6.45	6.47	6.49	6.51	6.51	6.37
Heating Capacity		kW	239.9	273.8	314.9	357.2	401.8	464.9	529.4	608.0	681.3	849.7	977.7	629.7
		10^4kCal/h	21	24	27	31	35	40	46	52	59	73	84	54
Power Input（kW）			53.1	60.6	69.6	78.8	88.4	102.1	115.9	132.8	148.5	184.8	212.6	139.2
COP		(W/W)	4.52	4.52	4.52	4.53	4.54	4.56	4.57	4.58	4.59	4.60	4.60	4.52
Compressor	Starting Method		Y-△											
	Capacity Control		25%～100% Stepless											12.5%～100% (Stepless)
	Power Supply		380V/3N～/50Hz											
	QTY		1											2
	Cooling Rated Current (A)		66	75	86	96	108	123	139	159	177	218	251	172
	Heating Rated Current (A)		95	108	123	139	155	178	201	229	254	315	362	247
	Max Current (A)		150	170	194	219	244	275	310	360	400	495	569	389
Protections			HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type		R134a											
	Charge (kg)		75	84	95	105	126	147	168	190	232	284	315	220
Evaporator	Cooling Water Flow（m³/h）		41	47	54	61	69	80	91	105	117	146	168	108
	Cooling Pressure Drop（kPa）		54	55	57	57	58	58	68	69	70	70	71	72
	Heating Water Flow（m³/h）		51	59	67	77	86	100	114	131	147	183	211	135
	Heating Pressure Drop（kPa）		62	64	65	66	67	67	79	80	81	81	82	83
	Pipe Diameter（mm）		108	108	108	108	108	108	133	133	159	159	159	159
	Pipe Connection		Clamp											
Condenser	Cooling Water Flow（m³/h）		51	60	67	77	88	100	114	131	147	183	211	135
	Cooling Pressure Drop（kPa）		55	58	58	57	59	60	71	73	73	74	74	74
	Heating Water Flow（m³/h）		41	48	54	61	69	80	91	105	117	146	168	108
	Heating Pressure Drop（kPa）		44	46	46	46	47	48	56	57	58	58	58	58
	Pipe Diameter（mm）		108	108	133	133	133	133	159	159	159	159	219	159
	Pipe Connection		Clamp											
Dimensions	Length（mm）		3100	3100	3100	3100	3100	3100	3700	3700	3700	3700	3700	4950
	Width（mm）		1400	1400	1450	1450	1500	1500	1550	1550	1750	1750	1750	1600
	Height（mm）		1750	1750	1800	1800	1900	1900	1950	1950	2150	2150	2150	2100
Shipping weight（kg）			2405	2680	2890	3040	3175	3630	3750	3995	4305	5025	5250	4965
Operating Weight（kg）			2525	2810	3090	3250	3400	3880	4030	4300	4660	5425	5710	5345

Notes：

1. Capacities above are based on：
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 25℃ entering source water with water flow equals cooling capacity * 0.215 m³/(h*kw)；
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 10℃ entering source water with water flow equals cooling capacity * 0.215 m³/（h*kw)；
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa；
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃；
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

Ground Loop Heat Pump Technical Specification

Item		Model	MCRH 0200	MCRH 0240	MCRH 0260	MCRH 0280	MCRH 0295	MCRH 0320	MCRH 0360	MCRH 0400	MCRH 0450	MCRH 0500	MCRH 0550	MCRH 0600
Cooling Capacity		kW	712.6	802.0	928.7	993.6	1058.4	1137.5	1216.5	1364.1	1533.3	1702.5	1830.7	1958.9
		10^4kCal/h	61	69	80	85	91	98	105	117	132	146	157	168
Power Input（kW）			111.6	125.2	144.5	154.4	164.2	176.2	188.1	210.3	236.0	261.7	281.4	301.1
EER		(W/W)	6.39	6.41	6.43	6.44	6.45	6.46	6.47	6.49	6.50	6.51	6.51	6.51
Heating Capacity		kW	714.4	803.5	929.8	994.3	1058.9	1137.4	1216.0	1362.6	1531.0	1699.4	1827.4	1955.4
		10^4kCal/h	61	69	80	86	91	98	105	117	132	146	157	168
Power Input（kW）			157.6	176.8	204.1	218.0	231.9	248.8	265.7	297.0	333.2	369.5	397.3	425.2
COP		(W/W)	4.53	4.54	4.56	4.56	4.57	4.57	4.58	4.59	4.59	4.60	4.60	4.60
Compressor	Starting Method		Y-△											
	Capacity Control		12.5%～100% Stepless											
	Power Supply		380V/3N～/50Hz											
	QTY		2											
	Cooling Rated Current (A)		193	215	247	263	279	298	318	353	395	437	470	503
	Heating Rated Current (A)		278	310	356	379	402	430	458	508	569	629	676	724
	Max Current(A)		437	488	550	584	619	670	720	800	895	990	1064	1139
Protections			HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type		R134a											
	Charge (kg)		240	270	290	320	340	346	380	400	450	480	500	540
Evaporator	Cooling Water Flow（m³/h）		123	138	160	171	182	196	209	235	264	293	315	337
	Cooling Pressure Drop（kPa）		73	73	74	74	74	73	74	74	74	74	75	75
	Heating Water Flow（m³/h）		153	172	200	214	228	245	262	293	330	366	394	421
	Heating Pressure Drop（kPa）		84	84	85	85	85	84	84	85	85	85	86	86
	Pipe Diameter（mm）		159	159	159	219	219	219	219	219	219	219	219	273
	Pipe Connection		Clamp											
Condenser	Cooling Water Flow（m³/h）		153	172	200	214	228	245	262	293	330	366	394	421
	Cooling Pressure Drop（kPa）		74	76	75	77	75	75	74	76	77	77	78	79
	Heating Water Flow（m³/h）		123	138	160	171	182	196	209	235	264	293	315	337
	Heating Pressure Drop（kPa）		59	60	60	61	60	59	59	60	61	61	62	62
	Pipe Diameter（mm）		159	159	159	159	219	219	219	219	219	273	273	273
	Pipe Connection		Clamp											
Dimensions	Length（mm）		4950	4950	5000	5000	5000	5000	5000	5150	5200	5500	5500	5500
	Width（mm）		1600	1600	1650	1650	1650	1650	1650	1800	1900	1950	1950	1950
	Height（mm）		2100	2100	2150	2150	2150	2150	2150	2250	2300	2300	2300	2300
Shipping weight（kg）			5300	5445	6310	6725	6890	7140	7395	7750	8780	9665	9845	10330
Operating Weight（kg）			5720	5925	6800	7250	7485	7830	8115	8530	9630	10625	10875	11635

Notes：

1. Capacities above are based on：
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 25℃ entering source water with water flow equals cooling capacity * 0.103m³/(h*kw)；
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 10℃ entering source water with water flow equals cooling capacity * 0.103m³/（h*kw)；
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa；
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃；
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

Water Loop Heat Pump Technical Specification

Item \ Model		MCRH 0070	MCRH 0080	MCRH 0090	MCRH 0100	MCRH 0120	MCRH 0140	MCRH 0160	MCRH 0180	MCRH 0220	MCRH 0270	MCRH 0300	MCRH 0170
Cooling Capacity	kW	233.4	254.7	292.9	332.7	374.3	433.5	494.0	567.8	636.6	794.6	914.3	585.9
	10^4kCal/h	19	22	25	29	32	37	42	49	55	68	79	50
Power Input（kW）		43.8	49.9	57.3	64.9	72.8	84.0	95.5	109.4	122.3	152.2	175.1	114.7
EER (W/W)		5.10	5.11	5.11	5.13	5.14	5.16	5.17	5.19	5.21	5.22	5.22	5.11
Heating Capacity	kW	301.9	344.0	395.7	449.0	505.0	584.5	665.7	764.6	856.9	1068.8	1229.8	791.4
	10^4kCal/h	26	30	34	39	43	50	57	66	74	92	106	68
Power Input（kW）		55.6	63.3	72.7	82.3	92.4	106.6	121.2	138.8	155.2	193.1	222.1	145.5
COP (W/W)		5.43	5.44	5.44	5.45	5.47	5.48	5.49	5.51	5.52	5.54	5.54	5.44
Compressor	Starting Method	Y-△											
	Capacity Control	25%～100% Stepless											12.5%～100% (Stepless)
	Power Supply	380V/3N～/50Hz											
	QTY	1											2
	Cooling Rated Current (A)	78	88	101	113	126	145	164	187	207	257	295	201
	Heating Rated Current (A)	100	113	129	145	162	186	210	239	266	329	378	258
	Max Current (A)	150	170	194	219	244	275	310	360	400	495	569	389
Protections		HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type	R134a											
	Charge (kg)	75	84	95	105	126	147	168	190	232	284	315	220
Evaporator	Cooling Water Flow（m³/h）	38	44	50	57	64	75	85	98	110	137	157	101
	Cooling Pressure Drop（kPa）	48	50	50	51	53	55	64	66	66	65	66	64
	Heating Water Flow（m³/h）	48	55	63	72	80	93	106	122	137	171	197	126
	Heating Pressure Drop（kPa）	59	61	61	62	64	66	78	80	80	79	81	78
	Pipe Diameter（mm）	108	108	108	108	108	108	133	133	159	159	159	159
	Pipe Connection	Clamp											
Condenser	Cooling Water Flow（m³/h）	48	55	63	72	80	93	106	122	137	171	197	126
	Cooling Pressure Drop（kPa）	52	54	55	55	56	57	68	69	70	70	71	71
	Heating Water Flow（m³/h）	38	44	50	57	64	75	85	98	110	137	157	101
	Heating Pressure Drop（kPa）	41	43	44	43	45	46	54	55	55	55	56	56
	Pipe Diameter（mm）	108	108	133	133	133	133	159	159	159	159	219	159
	Pipe Connection	Clamp											
Dimensions	Length（mm）	3100	3100	3100	3100	3100	3100	3700	3700	3700	3700	3700	4950
	Width（mm）	1400	1400	1450	1450	1500	1500	1550	1550	1750	1750	1750	1600
	Height（mm）	1750	1750	1800	1800	1900	1900	1950	1950	2150	2150	2150	2100
Shipping Weight（kg）		2405	2680	2890	3040	3175	3630	3750	3995	4305	5025	5250	4965
Operating Weight（kg）		2525	2810	3090	3250	3400	3880	4030	4300	4660	5425	5710	5345

Notes:

1. Capacities above are based on:
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 30℃ entering source water with water flow equals cooling capacity * 0.215 m³/(h*kw);
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 20℃ entering source water with water flow equals cooling capacity * 0.215 m³/（h*kw);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃;
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

Water Loop Heat Pump Technical Specification

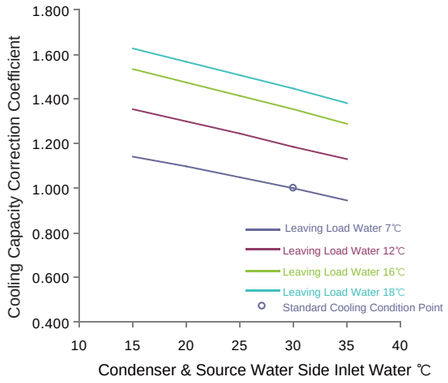
Item \ Model		MCRH 0200	MCRH 0240	MCRH 0260	MCRH 0280	MCRH 0295	MCRH 0320	MCRH 0360	MCRH 0400	MCRH 0450	MCRH 0500	MCRH 0550	MCRH 0600
Cooling Capacity	kW	665.4	748.7	866.9	927.5	988.0	1061.8	1135.5	1273.3	1431.2	1589.2	1708.8	1828.5
	10^4kCal/h	57	64	75	80	85	91	98	110	123	137	147	157
Power Input（kW）		129.8	145.6	168.1	179.5	191.0	204.9	218.8	244.6	274.5	304.3	327.3	350.2
EER (W/W)		5.13	5.14	5.16	5.17	5.17	5.18	5.19	5.21	5.21	5.22	5.22	5.22
Heating Capacity	kW	898.0	1010.1	1169.0	1250.2	1331.4	1430.3	1529.3	1713.8	1925.7	2137.7	2298.6	2459.6
	10^4kCal/h	77	87	101	108	115	123	132	147	166	184	198	212
Power Input（kW）		164.7	184.8	213.3	227.8	242.3	260.0	277.6	310.3	348.2	386.1	415.2	444.3
COP (W/W)		5.45	5.47	5.48	5.49	5.49	5.50	5.51	5.52	5.53	5.54	5.54	5.54
Compressor	Starting Method	Y-△											
	Capacity Control	12.5%～100% Stepless											
	Power Supply	380V/3N～/50Hz											
	QTY	2											
	Cooling Rated Current (A)	227	253	290	309	328	350	373	415	464	513	552	590
	Heating Rated Current (A)	290	324	372	396	420	449	478	531	594	657	707	756
	Max Current (A)	437	488	550	584	619	670	720	800	895	990	1064	1139
Protections		HP, LP, High Exhaust Temperature, Low Water Temperature, Low Oil Flow, Water Flow, Overload, Reverse Phase, Phase Loss .etc											
Refrigerant	Type	R134a											
	Charge (kg)	240	270	290	320	340	346	380	400	450	480	500	540
Evaporator	Cooling Water Flow（m³/h）	114	129	149	160	170	183	195	219	246	273	294	315
	Cooling Pressure Drop（kPa）	66	67	66	67	67	67	68	68	70	69	71	72
	Heating Water Flow（m³/h）	143	161	186	199	212	228	244	274	308	342	367	393
	Heating Pressure Drop（kPa）	81	81	80	81	81	81	82	82	85	83	86	86
	Pipe Diameter（mm）	159	159	159	219	219	219	219	219	219	219	219	273
	Pipe Connection	Clamp											
Condenser	Cooling Water Flow（m³/h）	143	161	186	199	212	228	244	274	308	342	367	393
	Cooling Pressure Drop（kPa）	72	73	73	74	73	72	72	73	74	74	74	75
	Heating Water Flow（m³/h）	114	129	149	160	170	183	195	219	246	273	294	315
	Heating Pressure Drop（kPa）	57	58	58	59	58	57	57	58	58	58	58	59
	Pipe Diameter（mm）	159	159	159	159	219	219	219	219	219	273	273	273
	Pipe Connection	Clamp											
Dimensions	Length（mm）	4950	4950	5000	5000	5000	5000	5000	5150	5200	5500	5500	5500
	Width（mm）	1600	1600	1650	1650	1650	1650	1650	1800	1900	1950	1950	1950
	Height（mm）	2100	2100	2150	2150	2150	2150	2150	2250	2300	2300	2300	2300
Shipping Weight（kg）		5300	5445	6310	6725	6890	7140	7395	7750	8780	9665	9845	10330
Operating Weight（kg）		5720	5925	6800	7250	7485	7830	8115	8530	9630	10625	10875	11635

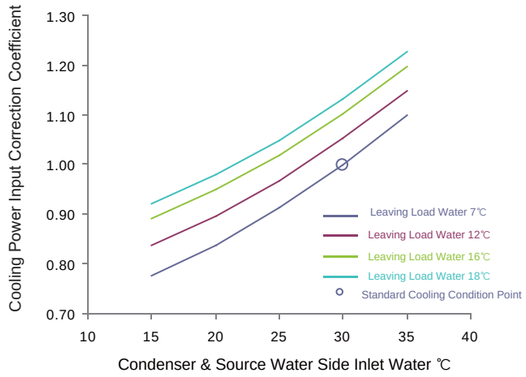
Notes:

1. Capacities above are based on:
   Cooling: 7℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 30℃ entering source water with water flow equals cooling capacity * 0.215 m³/(h*kw);
   Heating: 45℃ leaving load water with water flow equals cooling capacity * 0.172m³/(h*kW) and 20℃ entering source water with water flow equals cooling capacity * 0.215 m³/（h*kw);
2. Standard unit water side design pressure is 1.0MPa, optional with 1.6MPa and 2.0MPa;
3. The highest leaving hot water temperature is 65℃ in heating, please contact Mammoth if reuired water temperature is higher than 60℃;
4. Above parameters do not include heat recovery, please consult Mammoth for heat recovery information.

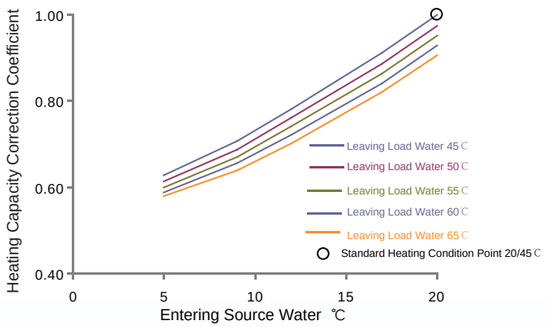
Performance Correction Curve

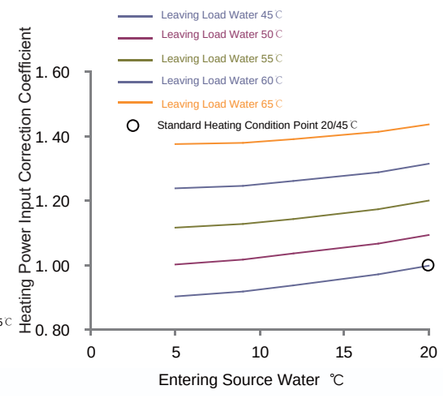
Cooling Correction Curve





Heating Correction Curve



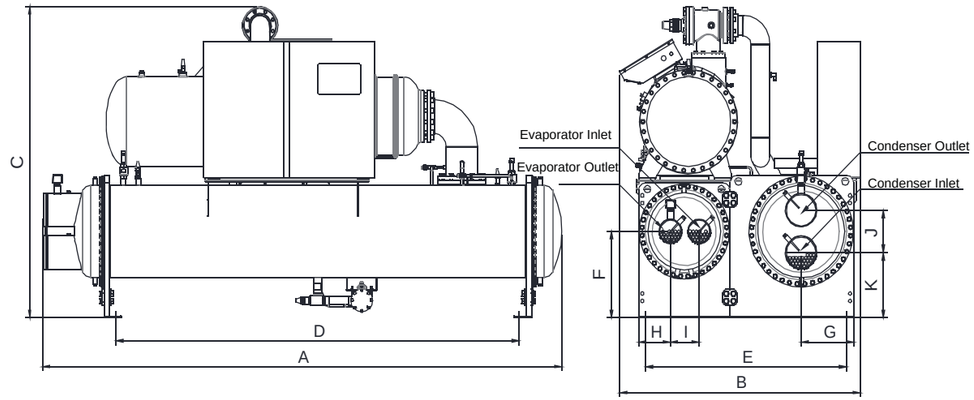


Notes:

1. Cooling: standard correction point of coefficient 1.0 is based on 12℃/7℃ entering / leaving evaporator water, and 30℃/35℃ entering / leaving condenser water.
2. Heating: standard correction point of coefficient 1.0 is based on 20℃ entering source water， and 45 ℃ leaving load water with same water flow as cooling condition.

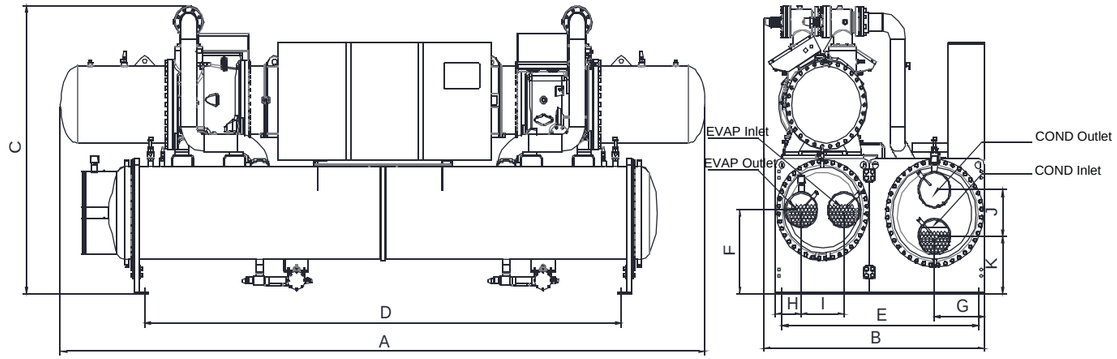
Dimensions

Unit Dimensions



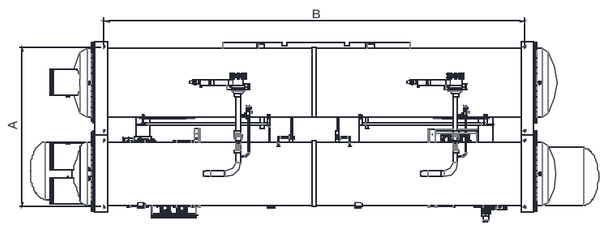
Model	Dimensions			Foot Hole and Pipe Size									
Water Cooled Chiller	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	Evaporator Pipe Connection	Condenser Pipe Connection
MCRH0070CMSNT	3100	1400	1750	2300	1050	497	245	175	200	200	352	DN100	DN100
MCRH0080CMSNT	3100	1400	1750	2300	1050	497	245	175	200	200	352	DN100	DN100
MCRH0090CMSNT	3100	1450	1800	2300	1130	522	270	190	200	200	377	DN100	DN100
MCRH0100CMSNT	3100	1450	1800	2300	1130	522	270	190	200	200	377	DN100	DN100
MCRH0120CMSNT	3100	1500	1900	2300	1170	522	295	190	200	280	357	DN100	DN125
MCRH0140CMSNT	3100	1500	1900	2300	1170	522	295	190	200	280	357	DN100	DN125
MCRH0160CMSNT	3700	1550	1950	2830	1250	547	320	165	280	280	382	DN125	DN150
MCRH0180CMSNT	3700	1550	1950	2830	1250	547	320	165	280	280	382	DN125	DN150
MCRH0220CMSNT	3700	1750	2150	2830	1360	572	345	180	280	310	392	DN150	DN150
MCRH0270CMSNT	3700	1750	2150	2830	1360	572	345	180	280	310	392	DN150	DN150
MCRH0300CMSNT	3700	1750	2150	2830	1410	572	370	180	280	350	397	DN150	DN200

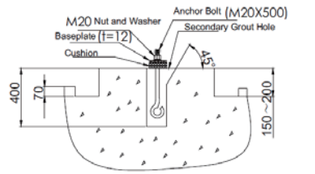
Flooded Units Dimensions



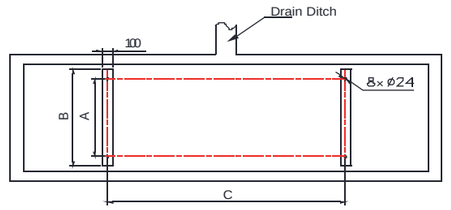
Unit Model	Outline Dimensions			Other Dimensions									
Water Cooled Unit	A	B	C	D	E	F	G	H	I	J	K	EVAP	COND
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Connection	Connection
MCRH0170CMSNT	4950	1600	2100	4030	1280	572	320	180	280	280	382	DN150	DN150
MCRH0200CMSNT	4950	1600	2100	4030	1280	572	320	180	280	280	382	DN150	DN150
MCRH0240CMSNT	4950	1600	2100	4030	1280	572	320	180	280	280	382	DN150	DN150
MCRH0260CMSNT	5000	1650	2150	4030	1340	572	345	180	280	310	392	DN150	DN150
MCRH0280CMSNT	5000	1650	2150	4030	1390	597	370	190	310	350	397	DN200	DN200
MCRH0295CMSNT	5000	1650	2150	4030	1390	597	370	190	310	350	397	DN200	DN200
MCRH0320CMSNT	5000	1650	2150	4030	1390	597	370	190	310	350	397	DN200	DN200
MCRH0360CMSNT	5000	1650	2150	4030	1390	597	370	190	310	350	397	DN200	DN200
MCRH0400CMSNT	5150	1800	2250	4030	1560	622	395	195	350	380	407	DN200	DN200
MCRH0450CMSNT	5200	1900	2300	4030	1610	647	395	205	380	380	407	DN200	DN200
MCRH0500CMSNT	5500	1950	2300	4030	1660	647	420	205	380	400	422	DN200	DN250
MCRH0550CMSNT	5500	1950	2300	4030	1660	647	420	205	380	400	422	DN200	DN250
MCRH0600CMSNT	5500	1950	2300	4030	1660	647	420	205	380	400	422	DN200	DN250

Installation Base





Anchor Bolt Embedment Sectional View



Installation Base

Notes:
1. The installation base diagram is for reference only, users shall amend according to the strength of concrete and site conditions;
2. The base shall be level with tolerance of less than 3mm;
3. The unit should be at least 150mm higher than the base, to leave space for unit service ;
4. Drainage trench is required around the base for maintenance.

Unit Model	Dimensions		
Water Cooled Unit	A	B	C
	mm	mm	mm
MCRH0070CMSNT	1050	1250	2300
MCRH0080CMSNT	1050	1250	2300
MCRH0090CMSNT	1130	1330	2300
MCRH0100CMSNT	1130	1330	2300
MCRH0120CMSNT	1170	1370	2300
MCRH0140CMSNT	1170	1370	2300
MCRH0160CMSNT	1250	1450	2830
MCRH0180CMSNT	1250	1450	2830
MCRH0220CMSNT	1360	1560	2830
MCRH0270CMSNT	1360	1560	2830
MCRH0300CMSNT	1410	1610	2830
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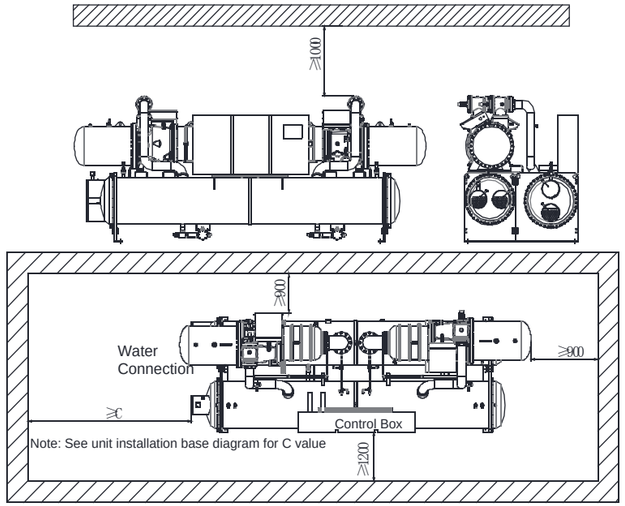
Unit Model	Dimensions		
Water Cooled Unit	A	B	C
	mm	mm	mm
MCRH0170CMSNT	1280	1480	4030
MCRH0200CMSNT	1280	1480	4030
MCRH0240CMSNT	1280	1480	4030
MCRH0260CMSNT	1340	1540	4030
MCRH0280CMSNT	1390	1590	4030
MCRH0295CMSNT	1390	1590	4030
MCRH0320CMSNT	1390	1590	4030
MCRH0360CMSNT	1390	1590	4030
MCRH0400CMSNT	1560	1590	4030
MCRH0450CMSNT	1610	1810	4030
MCRH0500CMSNT	1660	1860	4030
MCRH0550CMSNT	1660	1860	4030
MCRH0600CMSNT	1660	1860	4030

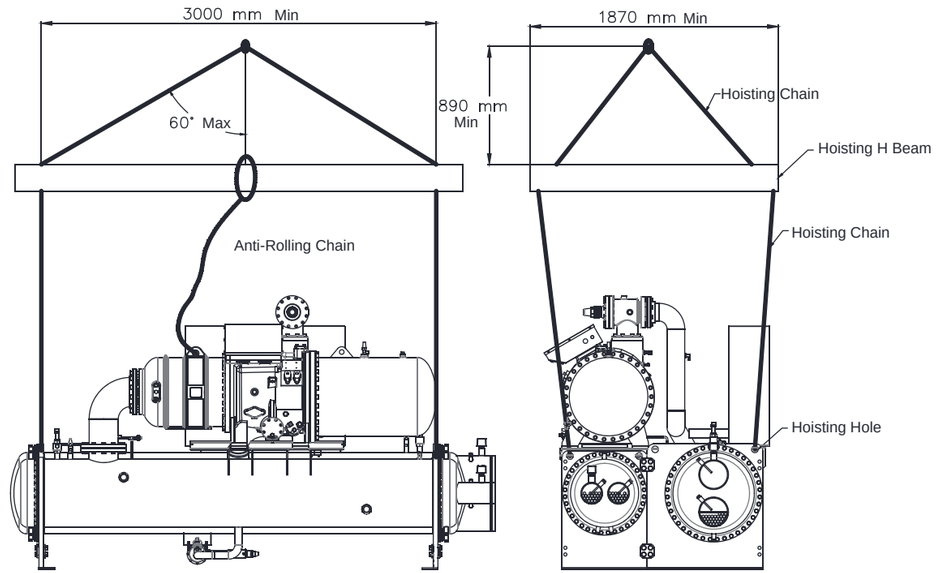
Service Clearance



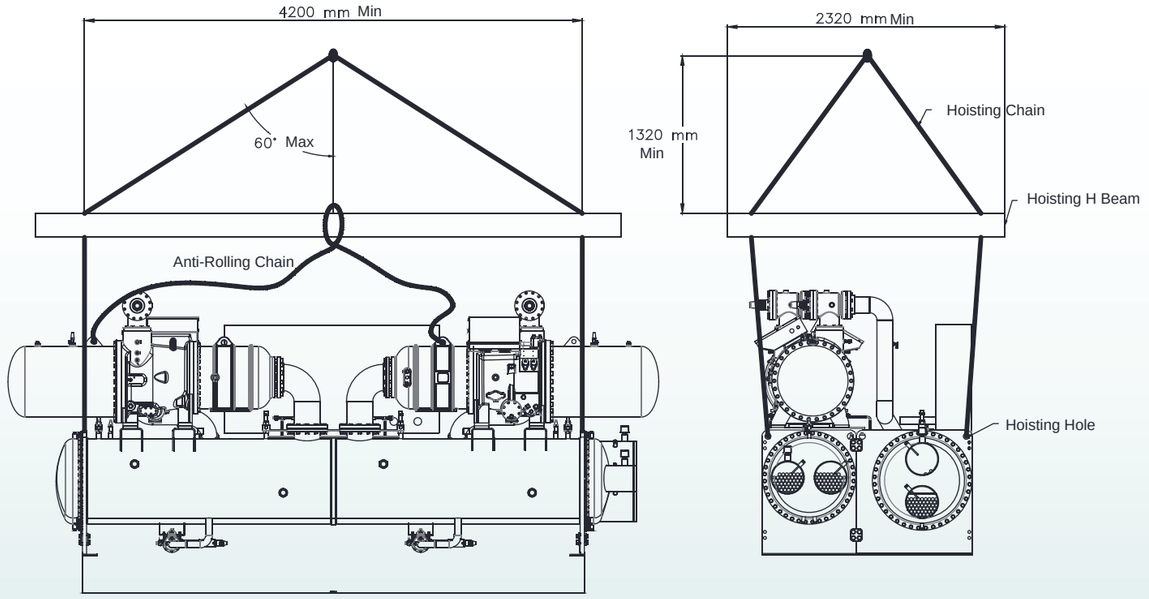
Service Clearance

Hoisting Diagram

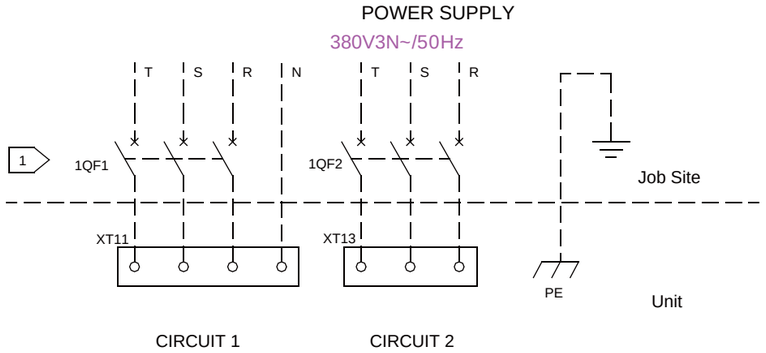
Single Circuit



Dual Circuits



Wiring Diagram



Notes:

1. Relay 1QF1, 1QF2 have to be prepared by client at site if the power breaker relay option has not been selected.
2. The quantity of circuits should be same as the ones of compressor.

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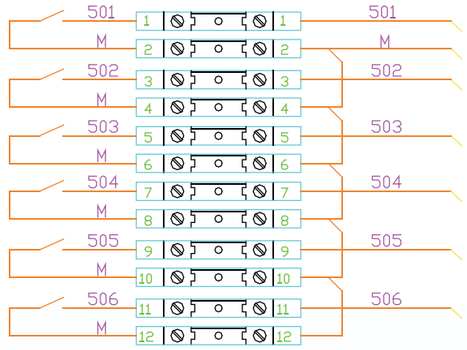
INPUT

REMOTE START-STOP SWITCH	5SK1
REMOTE COOLING-HEATING SWITCH	5SCH
EXTERNALINTER LOCK SWITCH	5SK2
CHLLED WATER FLOW SWITCH	5SF1
COOLING WATER FLOW SWITCH	5SF2
HOT WATER FLOW SWITCH	5SF3



XT10--

OUTPUT

CHILLED WATER PUMP START-STOP	
COOLING WATER PUMP START-STOP	
UNIT SPERATING FAULTS	
COMPRESSOR OPERATING STATUS	
HOT WATER PUMP START-STOP