

SCROLL-TYPE WATER- COOLED CHILLER (HEAT PUMP) UNIT

涡旋式水冷冷（热）水机组

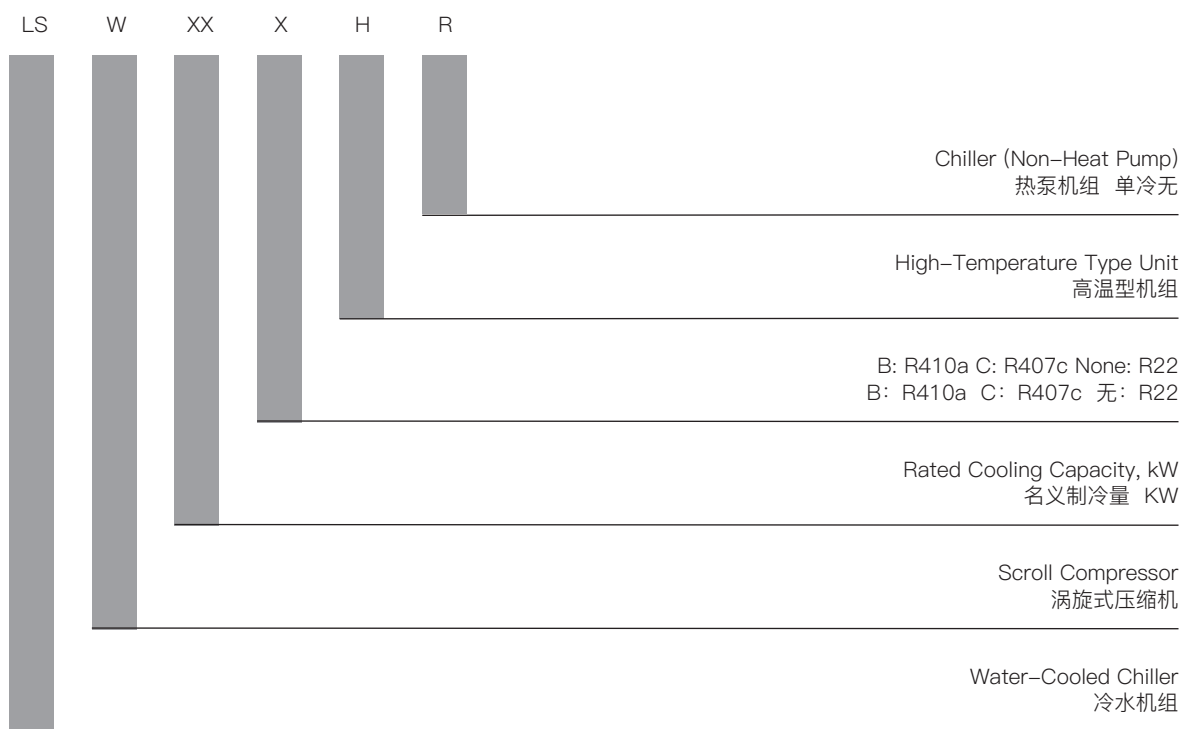
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NAMING RULES

命名规则



INTRODUCTION TO MAIN COMPONENTS OF THE DEVICE

机组主要部件介绍

The unit adopts scroll compressors, and the system consists of one to six compressors, combined with high-efficiency shell-and-tube condensers, evaporators, and a control system.

This series of units is suitable for central air conditioning systems in general households, villas, small restaurants, shops, hotels, KTV, offices, and commercial buildings.

1. Compressor Characteristics and Component Introduction

The scroll compressor itself has excellent liquid slugging resistance. After installing an oil heater, it can effectively prevent machine failure caused by insufficient oil and refrigerant separation during operation.

2. Evaporator

Shell-and-tube evaporator, equipped with high-efficiency internal grooved copper tubes, provides high heat exchange efficiency.

3. Condenser

(1) Shell-and-tube type: Single or multiple circuit design, combined with externally finned high-efficiency copper tubes.

(2) Steel shell: Manufacture and testing comply with the standard NB/T47012-2010 "Pressure Vessels for Refrigeration Devices".

4. Control System

Includes starting device, overheating protection, and power supply protection. The microcomputer controller uses well-known brand wide-temperature electronic components, capable of reliable operation in ambient temperatures from -15°C to 65°C , equipped with comprehensive automatic control functions and standard RS-232/RS-485 communication interfaces for remote control.

5. Control Method – Microcomputer Control Features:

(1) Controls the chiller based on the chilled water return or outlet temperature.

(2) Automatically shuts down when the load reaches the unit's shutdown setpoint, and can automatically restart.

(3) LCD display screen.

(4) Displays and sets inlet/outlet water temperatures, operating status, and compressor running time.

(5) Can accept remote start/stop signals.

6. Safety Features

High/Low pressure switch, Anti-freeze temperature protection, Oil heater, Temperature control, Pressure switch, Overload protector, Power supply protector.

7. Optional Items

Flow switch (field installation): Working pressure above 1.0MPa.



机组采用涡旋式压缩机，系统由一至六台压缩机组成。配合高效壳管式冷凝器、蒸发器及控制系统。

本系列机组适用于一般家庭、别墅、小型餐厅、商店、旅馆、KT\G 办公及商业大楼等中央空调系统。

1、压缩机特性及组件介绍

涡旋式压缩机本身具有优良的抗液击能力，安装油加热装置后更有效的防止运行时由于油氟分离不够产生的机器故障。

2、蒸发器

壳管式蒸发器，配合高效内螺纹铜管，换热效率高。

3、冷凝器

(1) 壳管式：单或多回路设计，配合外鳍式高效铜管。

(2) 钢制壳体：制作与试验均符合 NB — T47012 — 2010《制冷装置用压力容器》标准。

4、控制系统

含起动装置、过热保护装置和电源保护。微电脑控制器采用知名品牌宽温型电器元件，可在 -15℃至 65℃环境温度下可靠运行。具有完善的自动控制功能配备 RS — 232 / RS — 485 标准通讯接口，可实现远程控制。

5、控制方式微电脑控制特性：

(1) 以冷水回水或出水温度对冷水主机进行控制。

(2) 当负荷达到机组的停机设定值时，自动停机，且能自动启动。

(3) LCD 显示屏幕。

(4) 进回水温度显示和设定，运行状况、压缩机运转时间。

(5) 可接受远程开机、停机信号。

6、安全设施

高低压开关 防冻温度保护 机油加热器

温度控制 压力开关 过载保护器

电源保护器

7、选择件

流量开关（现场安装）：工作压力 1.0MPa 以上



PARAMETER TABLE

参数表

Parameter Table of Water Source Condition Cold (Hot) Water Unit (1)

水源工况冷（热）水机组参数表（一）

Unit Model 机组型号		LSW (C)	14	18	20	30	36	40
		LSW (C) R						
Rated Cooling Capacity 名义制冷量		kW	14.2	17	20	31.2	36	40.4
Cooling Input Power 制冷输入功率		kW	2.7	3	3.35	5.83	6.85	7.03
Rated Heating Capacity 名义制热量		kW	16	18.6	20.9	37	40.8	44
Heating Input Power 制热输入功率		kW	3.84	4.23	4.88	8.16	9.55	9.82
Compressor Type 压缩机形式			Hermetic Scroll Type 全封闭涡旋式					
Number of Compressors 压缩机数量		unit(s) 台	1	1	1	1	1	1
Power Supply 电源			3N-380V-50Hz					
Starting Method 启动方式			Direct start 直接启动					
Refrigerant 冷媒			R22					
Refrigerant Charge 冷媒充注量		kg	3.1	4.1	5	6	7	8
Refrigerant Control Device 冷媒控制装置			External balance thermal expansion valve 外平衡热力膨胀阀					
Use side heat exchanger 使用侧换热器	Type 型式		Sleeve type 套管式					Shell and tube 壳管式
	Water Side Pressure Drop 水阻力	kPa	45					
	Water Pipe Diameter 水管直径	DN	25	32	40	50	50	65
	Water Flow Rate 水流量	m³/h	2.4	2.9	3.4	5.4	6.2	6.9
Heat source side heat exchanger 热源侧换热器	Type 型式		Sleeve type 套管式					Shell and tube 壳管式
	Water Side Pressure Drop 水阻力	kPa	45					
	Water Pipe Diameter 水管直径	DN	25	32	40	50	50	65
	Water Flow Rate 水流量	m³/h	1.5	1.8	2.1	3.2	3.7	4.2
Control and Protection Devices 控制保护装置		高低压保护、防冻保护、温度控制、逆相欠相保护、高低电压保护、 高压排气温度保护、电机内置过热保护、过电流保护 1. High and low voltage protection 2. antifreeze protection 3. temperature control 4.reverse phase and underphase protection 5. high and low voltage protection 6. high pressure exhaust temperature protection 7.motor built-in overheat protection 8.overcurrent protection						
Overall Dimensions 外形尺寸		L	1150	1150	1150	1450	1450	1450
		W	710	710	710	860	860	860
		H	820	820	820	950	950	950
Unit Weight 机组重量		kg	140	150	168	230	250	250
Operating Weight 运行重量		kg	155	165	185	253	275	275

1. Standard Cooling Conditions: Heat source side inlet temperature – 18 °C, outlet – 29° C; User side inlet temperature – 12° C, outlet – 7° C.
2. Standard Heating Conditions: Heat source side inlet temperature – 15 °C, outlet – —° C; User side inlet temperature – 40° C, outlet – —° C.
3. Models LSW40(C)R and below are refrigerant circuit switching units.

Parameter table of cold (hot) water unit under water source conditions (2)

水源工况冷（热）水机组参数表（二）

Unit Model 机组型号		LSW (C)	60	80	100	120	160	200	240
		LSW (C) R							
Rated Cooling Capacity 名义制冷量		kW	59.4	80.8	103.2	121.2	161.6	202	242.4
Cooling Input Power 制冷输入功率		kW	10.68	14.06	17.49	21.09	28.12	35.15	42.18
Rated Heating Capacity 名义制热量		kW	64.8	88	105.8	132	176	220	264
Heating Input Power 制热输入功率		kW	14.62	19.64	24.48	29.46	39.28	49.1	58.92
Compressor Type 压缩机形式			Hermetic Scroll Type 全封闭涡旋式						
Number of Compressors 压缩机数量		unit(s) 台	2	2	3	3	4	5	6
Power Supply 电源			3N-380V-50Hz						
Starting Method 启动方式			Direct start 直接启动						
Refrigerant 冷媒			R22						
Refrigerant Charge 冷媒充注量		kg	11	15	20	23	30	38	45
Refrigerant Control Device 冷媒控制装置			External balance thermal expansion valve 外平衡热力膨胀阀						
Evaporator 蒸发器	Type 型式		Shell and tube 壳管式						
	Water resistance 水阻力	kpa	70						
	Pipe diameter 水管直径	DN	50	50	65	65	80	80	80
	Water flow on the cooling side 制冷使用侧水流量	m³/h	10.2	13.9	17.8	20.8	27.8	34.7	41.7
	Water flow rate of heating source side 制热热源侧水流量	m³/h	6.1	8.3	10.6	12.5	16.6	20.8	25.0
Condenser 冷凝器	Type 型式		Shell and tube 壳管式						
	Water resistance 水阻力	kpa	70						
	Pipe diameter 水管直径	DN	50	50	65	65	80	80	80
	Water flow on the cooling side 制冷使用侧水流量	m³/h	6.1	8.3	10.6	12.5	16.6	20.8	25.0
	Water flow rate of heating source side 制热热源侧水流量	m³/h	10.2	13.9	17.8	20.8	27.8	34.7	41.7
Control protection device 控制保护装置		高低压保护、防冻保护、温度控制、逆相欠相保护、高低电压保护、 高压排气温度保护、电机内置过热保护、过电流保护 1. High and low voltage protection 2. antifreeze protection 3. temperature control 4.reverse phase and underphase protection 5. high and low voltage protection 6. high pressure exhaust temperature protection 7.motor built-in overheat protection 8.overcurrent protection							
Dimensions 外形尺寸		L	2000	2000	2050	2050	2400	3000	3600
		W	900	900	900	900	900	1000	1000
		H	1300	1300	1500	1500	1500	1600	1700
Unit weight 机组重量		kg	360	400	680	690	954	1230	1310
Running weight 运行重量		kg	405	450	760	775	1070	1380	1470

- Standard Cooling Conditions: Heat source side inlet temperature – 18 °C, outlet – 29° C; User side inlet temperature – 12° C, outlet – 7° C.
- Standard Heating Conditions: Heat source side inlet temperature – 15 °C, outlet – —° C; User side inlet temperature – 40° C, outlet – —° C.
- Models LSW40(C)R and below are refrigerant circuit switching units.

Parameter Table of Ground Source Condition Cold (Hot) Water Unit (1)

地源工况冷（热）水机组参数表（一）

Unit Model 机组型号		LSW (C)	14	18	20	30	36	40
		LSW (C) R						
Rated Cooling Capacity 名义制冷量		kW	14	17	20	31	36	40
Cooling Input Power 制冷输入功率		kW	2.75	3	3.42	5.83	6.97	7.17
Rated Heating Capacity 名义制热量		kW	15	17.1	20	32.2	37.2	40.2
Heating Input Power 制热输入功率		kW	3.83	4.24	4.89	8.09	9.47	9.74
Compressor Type 压缩机形式			Hermetic Scroll Type 全封闭涡旋式					
Количество компрессоров 压缩机数量		unit(s) 台	1	1	1	1	1	1
Power Supply 电源			3N-380V-50Hz					
Starting Method 启动方式			Direct start 直接启动					
Refrigerant 冷媒			R22					
Refrigerant Charge 冷媒充注量		kg	3.1	4	5	6	6.5	7
Refrigerant Control Device 冷媒控制装置			External balance thermal expansion valve 外平衡热力膨胀阀					
Use side heat exchanger 使用侧换热器	Type 型式		Sleeve type 套管式					
	Water Side Pressure Drop 水阻力	kPa	45					
	Water Pipe Diameter 水管直径	DN	25	32	40	50	50	50
	Water Flow Rate 水流量	m³/h	2.4	2.9	3.4	5.8	6.2	6.9
THeat source side heat exchanger 热源侧换热器	Type 型式		Sleeve type 套管式					
	Water Side Pressure Drop 水阻力	kPa	45					
	Water Pipe Diameter 水管直径	DN	25	32	40	50	50	50
	Water Flow Rate 水流量	m³/h	3.0	3.7	4.3	6.3	6.3	8.6
Control and Protection Devices 控制保护装置		高低压保护、防冻保护、温度控制、逆相欠相保护、高低电压保护、 高压排气温度保护、电机内置过热保护、过电流保护 1. High and low voltage protection 2. antifreeze protection 3. temperature control 4.reverse phase and underphase protection 5. high and low voltage protection 6. high pressure exhaust temperature protection 7.motor built-in overheat protection 8.overcurrent protection						
Overall Dimensions 外形尺寸		L	1150	1150	1150	1450	1450	1450
		W	710	710	710	860	860	860
		H	820	820	820	950	950	950
Unit Weight 机组重量		kg	140	150	168	230	250	250
Operating Weight 运行重量		kg	155	165	185	253	275	275

Note:1.Standard Cooling Conditions: Heat source side inlet water temperature 25°C, outlet 30°C;
User side inlet water temperature 12°C, outlet 7°C.

2.Standard Heating Conditions: Heat source side inlet water temperature 10° C, outlet –° C; User
side inlet water temperature 40° C, outlet –° C.

3.Models including LSW40 (C) R and below are refrigerant circuit switching units.

注：1. 制冷标准工况：热源侧进水温度25°C，出水温度30°C；使用侧进水温度12°C，出水温度7°C。

2. 制热标准工况：热源侧进水温度 10° C，出水温度 –° C；使用侧进水温度 40° C，出水温度 –° C。

3. LSW40 (C) R 以下含 LSW40 (C) R 为氟路切换机组。

Parameter Table of Ground Source Condition Cold (Hot) Water Unit (2)

地源工况冷（热）水机组参数表（二）

Unit Model 机组型号		LSW (C)	60	80	100	120	160	200	240
		LSW (C) R							
Rated Cooling Capacity 名义制冷量		kW	59	80	102	120	160	200	240
Cooling Input Power 制冷输入功率		kW	10.88	14.34	17.85	21.51	28.68	35.85	43.02
Rated Heating Capacity 名义制热量		kW	59	80.4	102	120.6	160.8	201.0	241.2
Heating Input Power 制热输入功率		kW	14.48	19.48	24.27	29.22	38.96	48.7	58.44
Compressor Type 压缩机形式			Hermetic Scroll Type 全封闭涡旋式						
Number of Compressors 压缩机数量		unit(s) 台	2	2	3	3	4	5	6
Power Supply 电源			3N-380V-50Hz						
Starting Method 启动方式			Direct start 直接启动						
Refrigerant 冷媒			R22						
Refrigerant Charge 冷媒充注量		kg	11	15	20	22	30	37	44
Refrigerant Control Device 冷媒控制装置			External balance thermal expansion valve 外平衡热力膨胀阀						
Evaporator 蒸发器	Type 型式		Shell and tube 壳管式						
	Water resistance 水阻力	kpa	70						
	Pipe diameter 水管直径	DN	50	50	65	65	80	80	80
	Water flow on the cooling side 制冷使用侧水流量	m³/h	10.1	13.8	17.5	20.6	27.5	34.4	41.3
	Water flow rate of heating source side 制热热源侧水流量	m³/h	12.7	17.2	21.9	25.8	34.4	43	51.6
Condenser 冷凝器	Type 型式		Shell and tube 壳管式						
	Water resistance 水阻力	kpa	70						
	Pipe diameter 水管直径	DN	50	50	65	65	80	80	80
	Water flow on the cooling side 制冷热源侧水流量	m³/h	12.7	17.2	21.9	25.8	34.4	43	51.6
	Water flow rate of heating source side 制热使用侧水流量	m³/h	10.1	13.8	17.5	20.6	27.5	34.4	41.3
Control protection device 控制保护装置		高低压保护、防冻保护、温度控制、逆相欠相保护、高低电压保护、 高压排气温度保护、电机内置过热保护、过电流保护 1. High and low voltage protection 2. antifreeze protection 3. temperature control 4.reverse phase and underphase protection 5. high and low voltage protection 6. high pressure exhaust temperature protection 7.motor built-in overheat protection 8.overcurrent protection							
Dimensions 外形尺寸		L	2000	2000	2050	2050	2400	3000	3600
		W	900	900	900	900	900	1000	1000
		H	1300	1300	1500	1500	1500	1600	1700
Unit weight 机组重量		kg	360	400	680	690	954	1230	1310
Running weight 运行重量		kg	405	450	760	775	1070	1380	1470

Note:1.Standard Cooling Conditions: Heat source side inlet water temperature -°C, outlet 30°C; User side inlet water temperature -°C, outlet -°C.

2.Standard Heating Conditions: Heat source side inlet water temperature -°C, outlet -°C; User side inlet water temperature -°C, outlet -°C.

3.Models starting from LSW60 (C) R and above, including LSW60 (C) R, are water circuit switching units, which can provide partial and full heat recovery. If needed, users should contact the company for clarification.

注：1. 制冷标准工况：热源侧进水温度 -°C，出水温度 30°C；使用侧进水温度 -°C，出水温度 -°C。

2. 制热标准工况：热源侧进水温度 -°C，出水温度 -°C；使用侧进水温度 -°C，出水温度 -°C。

3. LSW60(C)R 及以上型号，包括 LSW60(C)R，为水路切换机组，可提供部分和全热回收。如有需要，用户应联系公司确认。

ATTACHED DRAWINGS

附图

Figure 1: Installation Diagram of Refrigerant Circuit Switching Unit – Groundwater Type

附图一：氟路切换机组安装示意图——地下水式

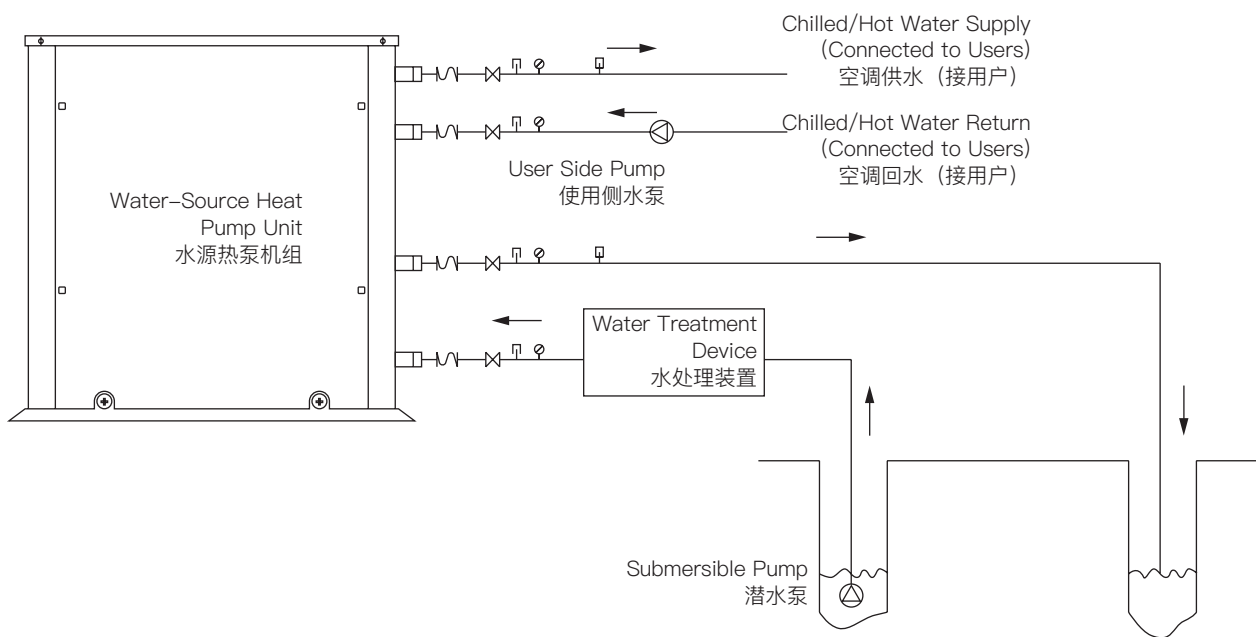
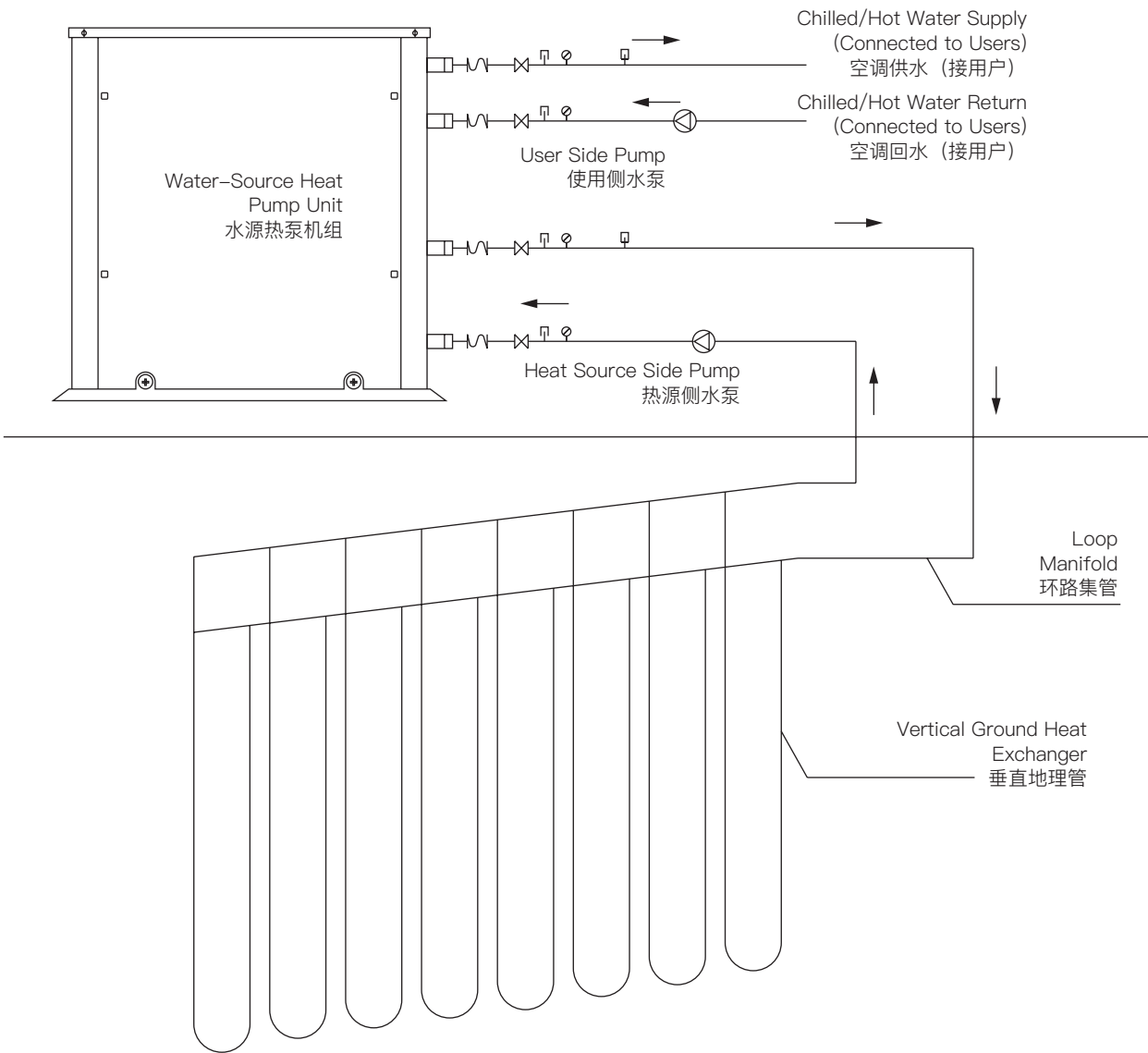


Figure 2: Installation Diagram of Refrigerant Circuit Switching Unit – Ground Heat Exchanger Type

附图二：氟路切换机组安装示意图——地理管式

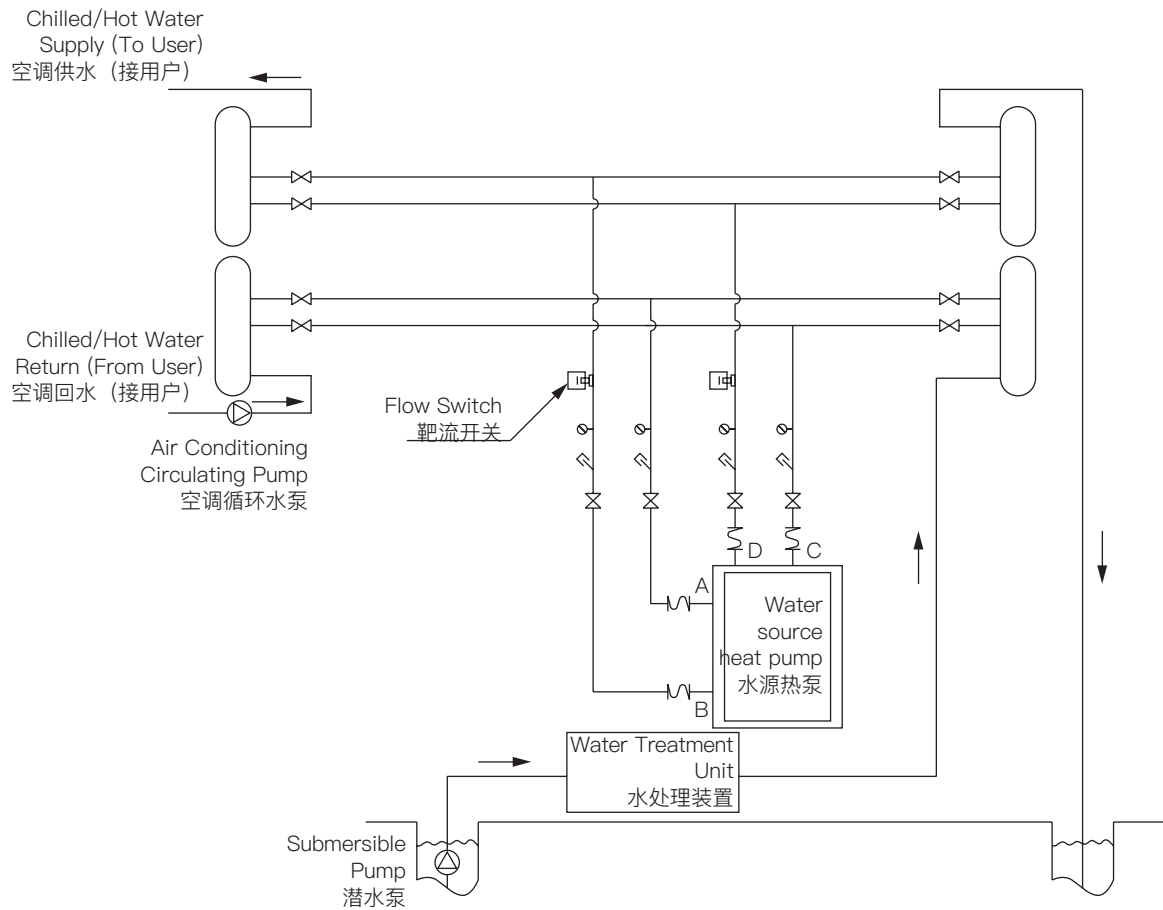


ATTACHED DRAWINGS

附图

Figure 3: Installation Diagram of Water Circuit Switching Unit – Groundwater Type

附图三：水路切换机组安装示意图——地下水式



Note:

Chilled Water Inlet — A
Chilled Water Outlet — B
Well Water Inlet — C
Well Water Outlet — D

Summer Operation Mode:

Valves 1, 3, 5, 7 OPEN
Valves 2, 4, 6, 8 CLOSED

Winter Operation Mode:

Valves 2, 4, 6, 8 OPEN
Valves 1, 3, 5, 7 CLOSED

注:

冷水进口——A
冷水出口——B
井水进口——C
井水出口——D

夏季运行:

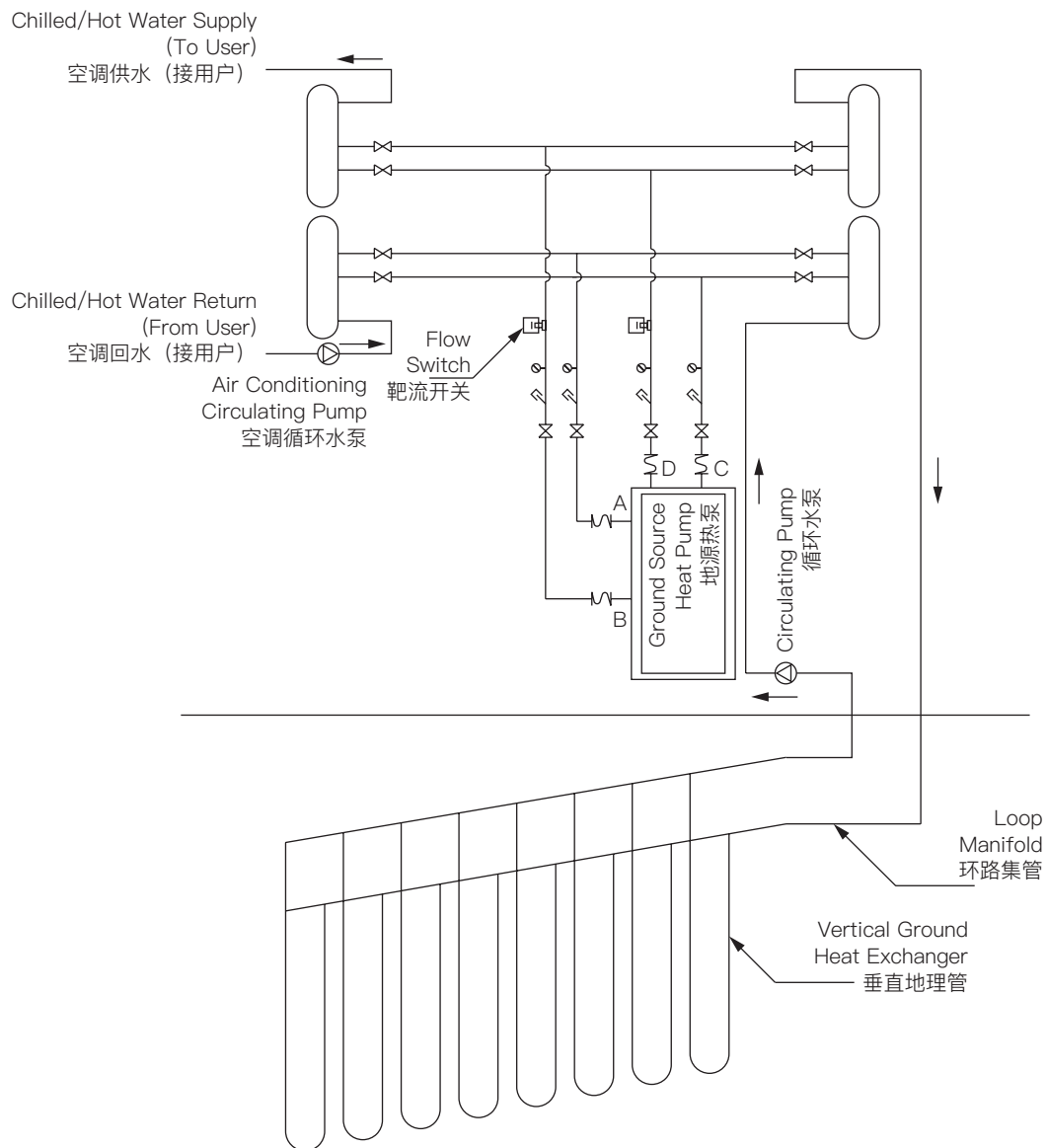
1.3.5.7 阀门打开
2.4.6.8 阀门关闭

冬季运行:

2.4.6.8 阀门打开
1.3.5.7 阀门关闭

Figure 4: Installation Diagram of Water Circuit Switching Unit – Vertical Ground Heat Exchanger Type

附图四：水路切换机组安装示意图——地理管式



Note:

Chilled Water Inlet — A
Chilled Water Outlet — B
Well Water Inlet — C
Well Water Outlet — D

Summer Operation Mode:

Valves 1, 3, 5, 7 OPEN
Valves 2, 4, 6, 8 CLOSED

Winter Operation Mode:

Valves 2, 4, 6, 8 OPEN
Valves 1, 3, 5, 7 CLOSED

注:

冷水进口——A
冷水出口——B
地源水进口——C
地源水出口——D

夏季运行:

1.3.5.7 阀门打开
2.4.6.8 阀门关闭

冬季运行:

2.4.6.8 阀门打开
1.3.5.7 阀门关闭

SUPPLEMENTARY TABLE

附表

Air Conditioning Load Estimation Table

空调负荷估算表

Category 分档	No 序号	Type 类别	Summer Cooling Load 夏季耗冷		Winter Heating Load 冬季耗热	
			W/m ²	Kcal/m ² .h	W/m ²	Kcal/m ² .h
Comprehensive indicators calculated based on building area 按建筑面积计算的综合指标	1	General Hotel 一般旅馆	115—140	100—120	93—115	80—100
	2	Hotel below 3 stars 三星以下旅馆	140—175	120—150	115—140	100—120
	3	Office Building 办公大楼	115—140	100—120	93—115	80—100
	4	Comprehensive Building 综合大楼	128—162	110—140	110—128	95—110
	5	Shopping Center 商厦	200—350	172—300	160—260	138—224
	6	General Store 一般商店	150—175	130—150	120—140	105—130
	7	Hospital 医院	115—140	100—120	115—140	100—120
	8	Sports Complex 体育场馆	180—470	155—405	120—180	103—155
	9	Computer Room 计算机房	175—290	150—250	110—128	95—110
	10	Multiplex Cinema 综合电影院	175—290	150—250	110—128	95—110
	11	Airport Terminal 空港	0—210	130—180	140—180	120—155
Minute class Means Means 分类指标	1	Standard Guest Room 标准客房	140—175	120—150	115—140	100—120
	2	General Office 一般办公室	116—175	100—150	105—128	90—110
	3	General Conference Room 一般会议室	174—290	150—250	115—140	100—120
	4	Chinese Restaurant 中餐厅	300—400	258—344	140—170	120—150
	5	Western Restaurant, Bar 西餐厅、酒吧	230—350	200—300	140—170	120—150
	6	Hair Salon, Beauty Salon 发廊、美容厅	230—350	200—300	140—170	120—150
	7	Ground Floor Shopping Area 底层商场	279—314	240—270	223—251	192—216
	8	Market above Second Floor 二层以上市场	186—233	160—200	149—186	128—160
	9	Large Sales Hall 大型营业厅	200—290	170—250	149—186	128—160
	10	Lobby 大堂	150—200	129—172	150—200	175—215
	11	Corridor 走廊	70	60	70	60
	12	General Hospital Ward 医院一般病房	140—175	120—150	115—140	100—120
	13	Operating Room 手术室	230—350	200—300	140—200	120—172

Notes

The above data are estimated values. For accuracy, calculations for the air-conditioned rooms and outdoor conditions must be performed.

a) The indicated values already include the cooling/heating consumed for supply air (system or infiltration).

b) The data are given for the Jinan region. For other regions, appropriate coefficients should be applied.

c) When selecting the outdoor unit, special attention should be paid to the simultaneous usage coefficient of air conditioners in the building. This coefficient is <1.

注释：上数据为估算值，应对空调房间及室外计算更为准确。

a) 以上值已包含新风（系统或渗透）耗冷（热）量。 b) 以上数值为济南地区，其它地区应乘以相应系数。

c) 选用室外机时，应特别注意建筑物空调的同时使用系数，该系数 <1。

SELECTION OF FLOW VELOCITY IN WATER PIPES

水管流速选择

1. Recommended Flow Velocities according to Code GB50013-2006 "Code for Design of Outdoor Water Supply Engineering"

1. GB50013-2006 《室外给水设计规范》推荐流速

Pipe Type 管道种类	Nominal Pipe Diameter (mm) 管道公称直径 (mm)		
	<250	250-1000	>1000
Pump Suction Pipe 水泵吸水管	1.0-1.2	1.2-1.6	1.5-2.0
Pump Discharge Pipe 水泵出水管	1.5-2.0	2.0-2.5	2.0-3.0

2. Recommended Flow Velocities from Design Manuals (m/s)

2. 设计手册推荐的流速 (m/s)

Pipe Type 管道种类	Recommended Velocity (m/s) 推荐流速 (m/s)	Pipe Type 管道种类	Recommended Velocity (m/s) 推荐流速 (m/s)
Pump Suction Pipe 水泵吸水管	1.2-2.1	Manifold 集管	1.2-4.5
Pump Discharge Pipe 水泵出水管	2.4-3.6	Drain Pipe 排水管	1.2-2.0
General Water Supply Main 一般供水干管	1.5-3.0	Connection from Municipal Water Supply Pipe 接自城市供水管	0.9-2.0
Vertical Riser for Internal Water Supply 室内供水立管	0.9-3.0		

3. Comparison of Prices for Pipes and Fittings of Different Diameters

3. 不同直径管道和管件的比价

With increasing diameter, the cost of the pipes themselves, fittings (such as valves), and installation increases significantly. Therefore, for large-diameter pipes, the flow velocity should be chosen close to the upper limit.

随着直径的增大，管道本身和阀门等配件的价格以及安装费用都大幅度上升。因此，对大直径管道，流速宜选择接近上限的数值。



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