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 **DEKON** Air Cooled Scroll Chiller

Ningbo Dekon Refrigeration Equipment Co., Ltd, a large-scale industry and trade integrated company , is one of the leading manufacture and supplier for air conditioner products and ventilation systems in China. Products focus on air cooled or water cooled chiller; air handling units; water fan coil units; VRF air conditioner; light commercial air conditioner and special function industrial air conditioner.

Designing and manufacturing a wide range of A/C and ventilation products, we can supply models for use in residential apartments, houses, commercial buildings, hotels, shopping malls and public venues. Marketing all series under our proprietary brand "DEKON" , we can also complete ODM and OEM orders as per customers' requirements.

DEKON strives for better air in your home, hotel, shopping Center and office buildings. And our aim is to supply our air conditioner product to each corner of the world !



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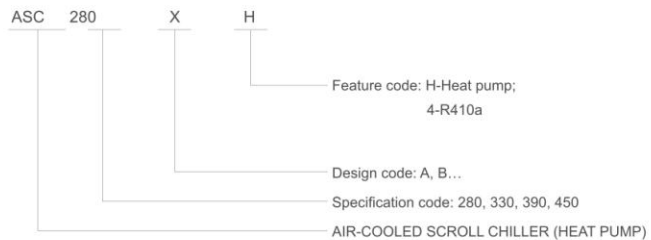
Product Overview



Dekon Air-cooled scroll chiller is a central air conditioning unit that uses air as cooling or heating source, and water as secondary refrigerant. It can be combined with multiple terminal equipment, like fan coil and AHU, to form a centralized air conditioning system. Air-cooled scroll chiller (heat pump) uses cooling parts and control components provided by world-famous manufacturers, together with the most cutting-edge intelligent control system, to make it highly efficient, energy conserving, stable and reliable. With a wide variety of specifications and functions, it supports the control over up to 8 units at the same time; it can also be connected to the building automation system (BAS) to easily meet various air-conditioning requirements in different places.

Without a cooling water system, air-cooled scroll chiller (heat pump) is simple in its pipeline network, easily installed, cost effective, and short in construction period and can be invested by stages. The system is widely applied to various situations for comfortableness and arts and crafts, such as villas, hotels, hospitals, office buildings, restaurants, supermarkets and theaters.

Nomenclature



Product Features

Environmentally friendly

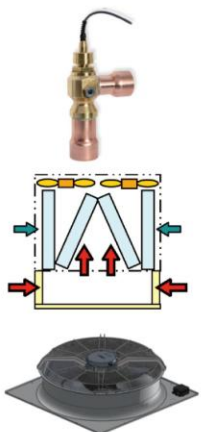


- Uses eco-friendly refrigerant R410A. Such chlorine-free refrigerant does not harm the ozone layer (zero-ODP), and is stable and non-toxic. Therefore, it is environmentally friendly and is unlikely to be replaced. In addition, it is good in heat exchanging, which could help boost the unit performance and lower energy consumption.
- Always focused on development of green and environmentally friendly products, Dekon is among the first batch of demonstrative enterprises in China's air conditioning sector for industrial and commercial use to conclude agreements with the Ministry of Environmental Protection to eliminate HCFC.

High-end configuration

- Dekon unit uses highly efficient fully-closed scroll compressor provided by world-famous manufacturers, which is dedicated for R410A refrigerant, and is able to work in a variety of situations and even extremely bad operating conditions.
- Dekon's own tube heat exchanger has patented counterflow design, which configures liquid distributor at the entrance of refrigerant pipe, to ensure that the refrigerant can be distributed to every heat exchange pipe evenly at every process. As a result, the heat exchange efficiency is increased by 20% to 30%; its professional software for fluid designing could lower the water side resistance of heat exchanger as much as possible and reduce energy consumption for customers while ensuring highly efficient heat transmission.





- The high-precision electronic expansion valve can respond quickly no matter the unit is operating in full load or partial load; together with number of steps at 2500, and dedicated electronic expansion valve drive board, the flow of refrigerant could be regulated precisely. Compared with the thermal expansion valve, electronic expansion valve is able to give full use of its evaporator, which ensures more adequate and efficient heat exchange.
- The wind-side heat exchanger adopts a unique process design to ensure that the refrigerant is in the best flow rate in any condition. In this way, the refrigerant pressure in the wind-side heat exchange copper pipe can be reduced to a minimum, which effectively decreases the power consumption of the compressor and improves the energy efficiency of the unit. The use of inverted "M" type heat exchanger reduces ventilation resistance, improves air flow velocity distribution, and increases efficiency and defrosting performance. The use of new open-window aluminum fin greatly enhances the air turbulence of the wind-side heat exchange tube and the surface of the fin. In this way, the heat exchange efficiency is increased by about 8%.
- The unit adopts the famous low-noise type outer rotor axial flow fan with long type air duct for diversion to effectively reduce the airflow noise. Before delivery, the fan has undergone strict tests for static and dynamic equilibrium to ensure stable and low-noise operation. The fan owns two-stage speed regulation design, which enables automatic switch from grade 6 to grade 12, ensuring a wide range of wind speed regulation and extending the operating range of the whole unit.

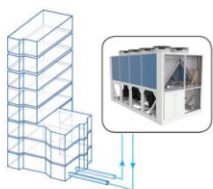


Stable operation

- Fan motor and control cabinet with protection level at IP54 and above can cope with extreme weather, such as strong wind and heavy rain, to ensure safe operation of the unit.
- The unit control system features high efficiency, reliability, and intelligence through constant optimization. All cooling parts and control components of the unit are provided by world-famous suppliers to make the unit compact, highly efficient, energy saving, and reliable.
- The performance, reliability and structure of the unit are verified and optimized by the long-term simulation tests under various changing conditions and extreme conditions, heat pump defrosting, as well as transportation experiment on actual tertiary roads.

Easy to install

- The compact structure of the unit takes small space and is cost-saving.
- The lifting lug design makes the hoisting process simple and safe. Inlet and outlet pipes are clamped, which makes the field installation easier.
- The water pipe of the water-side heat exchanger has been equipped with the water flow switch. The unit comes with the startup cabinet and control cabinet and has been filled with refrigerant and refrigeration oil before delivery. Only the water pipe and power supply need to be connected upon installation on site. The unit can be put into use after the initial field commissioning by the after-service personnel of Dekon, thus greatly reducing field installation time.



Unit microcomputer control center



- The industrial-level microcomputer controller, together with the LCD touch screen, constitutes the control unit of the unit. While Dekon's unique self-control technology and up-to-edge control technology in the world create powerful control functions of our controller.
- The leading intelligent control program ensures accurate management of water temperature under any condition and guarantees energy-saving, safe, and stable operation of the unit by automatic control. Meanwhile, the advanced pre-control function enables measures to be taken timely before actual failure occurs to avoid frequent shutdown of the unit.
- The unit supports the compiling of weekly operating schedules to implement comprehensive automatic start and stop control of the unit, which truly implements unattended and automatic operation.

Main functions	Protection functions
Local and remote automatic control	Phase sequence protection
Start and stop control of the unit	Compressor motor overheat protection
Real-time display of the operating status and parameters	Compressor motor overload protection
Display and settings of control parameters	Fan overload protection
Self-test upon unit startup	Protection of too high condensation pressure (exhaust)
Adjustment and control of the energy	Protection of too low evaporation pressure (suction)
Control of the balanced operation of the compressor	Anti-freezing protection
Control to prevent frequent startup of the compressor	Disconnection protection
Graded energy-saving control of the fan	Protection of too high air exhaust temperature
Smart defrosting control	Protection of too high water temperature
Water pump interlock control	Freezing protection
Multi-unit control	Communication failure protection
Real-time displaying	
Operation permission grading function	
Automatic shutdown upon alarm and failure display function	
Historical fault memory function	
RS485 communication interface (communication function)	

Flexible and convenient group communication

- The unit adopts the modular design. Each microcomputer controller of the unit reserves the interface for connecting the combined control module. Networking control between units can be implemented by cable connection and simple master-slave settings. A maximum of 8 main units can be controlled in a combined manner, which means that the unit capacity can be easily expanded to meet various air-conditioning requirements in different places. The main unit can be used to manage all modules in a centralized manner, select the number of modules, and monitor the operating data and status.
- Standard RS485 interface and MODBUS RTU protocol are provided, and the unit is connected to the building automation system (BAS), which implements centralized control and remote monitoring of the unit and control of other attached devices according to the controlling requirement of the BAS.

Technical Specifications

Technical performance table of air-cooled scroll chiller (heat pump) (R410A)

Model ASC-AH/C4		280	330	390	450	
Nominal cooling	Cooling capacity	kW	283	332	391	455
		kcal/h	243380	285520	336260	391300
	Input power	kW	87	102	121	139
	Rated current	A	151	177	210	242
Nominal heating*	Heating capacity	kW	297	345	418	478
		kcal/h	255420	296700	359480	411080
	Input power	kW	92	109	131	149
	Rated current	A	160	189	228	259
Maximum startup current		A	473	549	615	646
Maximum operating current		A	242	271	341	374
Power supply		380V 3N~ 50Hz				
Refrigerant	Type	R410A				
	Quantity of refrigerant system	2				
Compressor	Type	Hermetic scroll compressor				
	Energy regulation range	25%-100% four-grade regulation				
	Startup type	Direct starting				
Fan	Air flow	m ³ /h	100000	150000	150000	200000
	Quantity	台	4	6	6	8
Water-side heat exchanger	Type	Highly efficient tube type				
	Water flow	m ³ /h	49	57	67	78
	Water inlet/outlet pipe diameter	DN	100	100	125	125
	Water pressure drop	kPa	73	77	71	75
	Water-side pressure	MPa	1.0			
Dimensions	Length	mm	2560	3565	3565	4570
	Width	mm	2250			
	Height	mm	2470			
Unit weight	Cooling-only transportation	kg	2250	2850	2900	3500
	Cooling-only operation	kg	2400	3000	3050	3650
	Heat pump transportation	kg	2450	3050	3100	3700
	Heat pump operation	kg	2600	3200	3250	3850

★ Note

- Under the nominal operating conditions of cooling: chilled water entering/leaving temperature is 12°C/7°C, ambient dry bulb temperature is 35°C;
- Under the nominal operating conditions of heating: hot water entering/leaving temperature is 40°C/45°C, ambient dry/wet bulb temperature is 7°C/6°C;
- Allowable voltage fluctuation is ±10%;
- * Indicates heating parameters of heat pump unit, and there are no heating parameters for standard cooling-only type;
- Operating range of perennial cooling unit: -10°C~45°C;

Specifications Under Variable Operating Condition

Corrected value of technical parameters/cooling condition of air-cooled scroll chiller (heat pump)

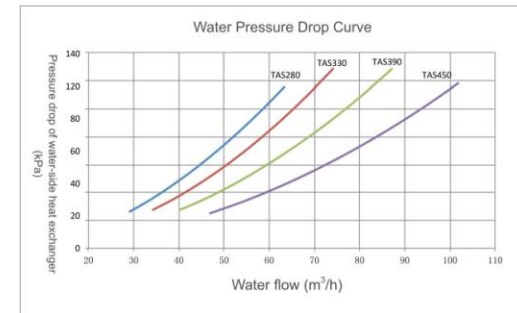
Model ASC-AH/C4	Water outlet temperature (°C)	Ambient temperature (°C)											
		20		25		30		35		40		45	
		Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW
280	5	314	67.7	299	72.9	283	78.0	266	84.7	248	92.2	229	101.1
	7	334	69.9	318	74.4	301	80.3	283	87.0	264	95.2	245	104.1
	8	344	70.6	328	75.9	310	81.8	292	88.5	272	96.7	252	105.6
	10	364	72.9	347	78.0	329	84.0	309	91.4	289	99.6	267	109.3
	12	385	75.1	367	80.3	347	87.0	326	94.4	305	103.4	282	113.0
330	5	418	78.8	398	84.7	376	91.4	354	99.6	330	108.6	305	119.7
	7	392	81.9	374	87.2	354	94.1	332	102.0	309	111.6	287	122.1
	8	403	82.8	385	88.9	364	95.9	342	103.7	319	113.3	295	123.8
	10	427	85.5	407	91.5	385	98.5	362	107.2	339	116.8	313	128.1
	12	452	88.0	431	94.1	407	102.0	383	110.7	357	121.2	331	132.5
390	5	434	94.1	413	101.4	391	108.5	368	117.9	343	128.3	317	140.6
	7	462	97.2	440	103.5	416	111.7	391	121.0	364	132.4	338	144.8
	8	475	98.3	453	105.5	429	113.7	403	123.1	375	134.4	348	146.9
	10	503	101.4	480	108.5	454	116.9	427	127.2	399	138.5	369	152.0
	12	532	104.4	507	111.7	480	121.0	451	131.3	421	143.7	390	157.2
450	5	577	109.6	549	117.9	520	127.2	490	138.5	456	151.0	422	166.5
	7	505	108.1	481	116.5	455	124.7	428	135.4	399	147.3	369	161.5
	8	537	111.6	512	118.8	485	128.3	455	139.0	424	152.1	393	166.4
	10	553	112.9	527	121.2	499	130.7	469	141.4	437	154.4	405	168.7
	12	585	116.5	558	124.7	528	134.3	496	146.1	464	159.2	429	174.6
450	15	619	120.0	590	128.3	558	139.0	525	150.8	490	165.1	454	180.6
	15	672	125.9	639	135.4	605	146.1	570	159.2	531	173.5	491	191.3

Corrected value of technical parameters/heating condition of air-cooled scroll chiller (heat pump)

Model ASC-AH1 C4	Water outlet temperature (°C)	Ambient temperature (°C)															
		-10		-5		0		5		7		10		15		21	
		Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW	Cooling capacity kW	Power kW
280	30	196	65.9	226	67.5	260	70.0	297	72.6	314	73.4	341	76.0	391	79.3	459	85.3
	35	193	70.0	222	72.6	255	74.2	292	77.6	309	78.5	335	81.1	383	85.3	449	91.2
	40	189	76.0	219	77.6	251	80.2	286	83.5	302	84.4	328	86.9	376	92.0	440	98.7
	45	187	81.9	215	84.4	246	86.9	282	90.3	297	92.0	322	94.6	369	99.6	431	107.2
	50	185	89.4	212	92.0	242	94.6	276	98.7	292	100.5	316	103.8	361	108.8	422	117.3
	55	184	97.9	210	100.5	239	103.8	272	108.0	287	110.6	311	114.0	354	119.9	413	129.2
330	30	228	78.0	263	80.0	302	82.9	345	86.0	365	87.0	396	90.0	454	94.0	533	101.0
	35	224	82.9	258	86.0	297	88.0	339	92.0	358	93.0	389	96.0	445	101.0	522	108.0
	40	220	90.0	254	92.0	292	95.0	333	99.0	351	100.0	382	103.0	437	109.0	511	117.0
	45	217	97.0	249	100.0	286	103.0	327	107.0	345	109.0	374	112.1	428	118.0	501	127.0
	50	215	105.9	247	109.0	282	112.1	321	117.0	339	119.0	367	123.0	419	128.9	491	139.0
	55	214	116.0	244	119.0	278	123.0	316	128.0	333	131.0	361	135.1	411	142.0	480	153.0
390	30	276	93.8	319	96.2	366	99.7	418	103.4	442	104.5	480	108.2	550	112.9	645	121.4
	35	272	99.7	313	103.4	359	105.7	410	110.6	434	111.7	471	115.4	539	121.4	632	129.8
	40	266	108.2	308	110.6	353	114.2	403	118.9	426	120.1	462	123.8	530	131.0	619	140.6
	45	263	116.6	302	120.1	347	123.8	396	128.6	418	131.0	454	134.7	519	141.9	607	152.6
	50	260	127.3	299	131.0	341	134.7	389	140.6	410	143.1	445	147.8	508	155.0	594	167.0
	55	259	139.4	296	143.1	337	147.8	383	153.8	404	157.5	438	162.3	498	170.7	581	183.9
450	30	316	106.7	364	109.4	419	113.4	478	117.6	505	118.9	549	123.1	629	128.4	738	138.1
	35	311	113.4	358	117.6	411	120.2	469	125.8	497	127.1	539	131.3	617	138.1	723	147.7
	40	304	123.1	352	125.8	404	129.9	461	135.3	487	136.6	529	140.8	606	149.0	708	159.9
	45	301	132.6	346	136.6	396	140.8	453	146.3	478	149.0	519	153.2	593	161.4	694	173.6
	50	297	144.8	342	149.0	390	153.2	445	159.9	469	162.7	509	168.1	581	176.3	680	190.0
	55	296	158.5	338	162.7	385	168.1	438	174.9	462	179.1	500	184.6	570	194.1	665	209.2

Specifications Under Variable Operating Condition

Water Pressure Drop Curve



Unit operating range

Cooling condition		
Tube-type heat exchanger (condenser)	Minimum temperature	Maximum temperature
Water entering temperature (upon start) °C	-	35
Water leaving temperature (during operation) °C	5	15
Fin-type heat exchanger (evaporator)	Minimum temperature	Maximum temperature
Air inlet temperature °C	15	45
Heating condition		
Tube-type heat exchanger (condenser)	Minimum temperature	Maximum temperature
Water entering temperature (upon start) °C	5	-
Water leaving temperature (during operation) °C	30	55
Fin-type heat exchanger (evaporator)	Minimum temperature	Maximum temperature
Air inlet temperature °C	-15	21

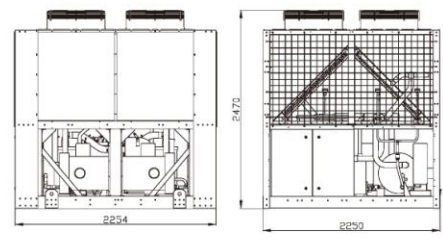
★ Note

- The function of operating under all conditions is available, thus greatly expanding the operation conditions of the unit.

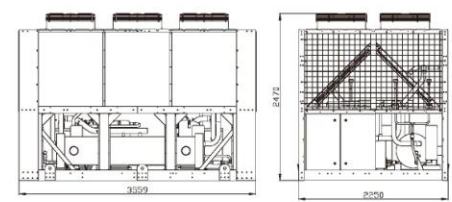
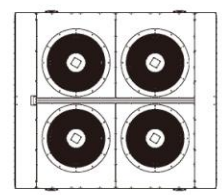
Optional Configurations

Perennial cooling/operating under all conditions	to greatly expand operating temperature range of the unit.
Compressor noise enclosure	to reduce the compressor noise.
Protection screen	to effectively protect the unit.
Accessory	spring shock absorber.
Process refrigeration unit	to provide customized inlet/outlet water temperature condition.

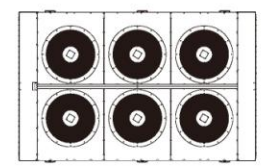
Unit Dimensions



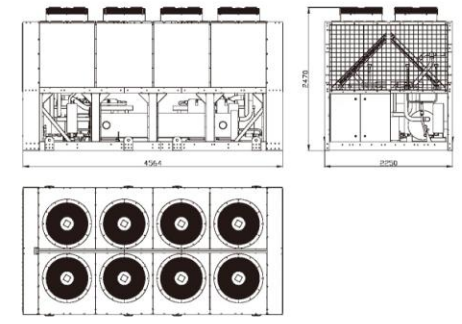
ASC280AH4



ASC330/390AH4

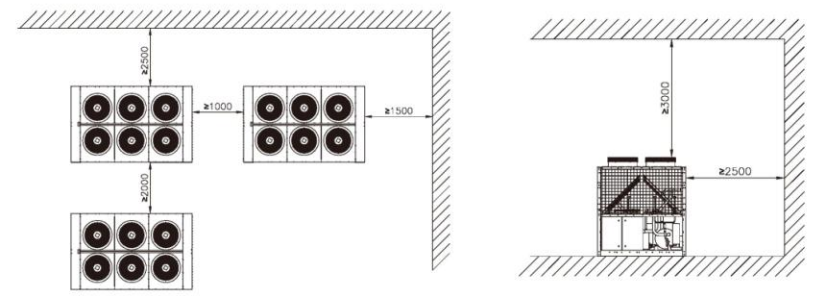


ASC450AH4



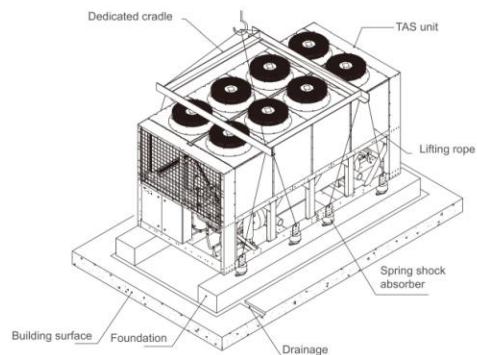
Assembly and Layout Mode

Unit Installation Space Diagrams



- Notes:
1. The place for installation must be well ventilated. To prevent inverse flow of condenser air, it is recommended to reserve side spacing as shown above; under such conditions, there should not be any obstacles under the unit;
 2. If the unit is blocked by buildings on top, at least as high as 3m shall be reserved, to ensure air ventilation;
 3. Since the re-circulating hot air seriously affects the energy efficiency ratio of unit and even causes the condensing pressure to be too high or the fan motor to get faulty, be sure to reserve the above-mentioned installation space.

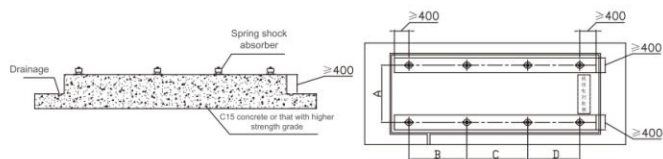
Unit Lifting and Placement Diagrams



★ Remarks

1. Lift the unit according to the diagram. Make sure to use dedicated lifting equipment, such as cradle, to protect the unit.
2. In case of any scratches occurring during lifting process, please treat the damaged parts.

Foundation drawing

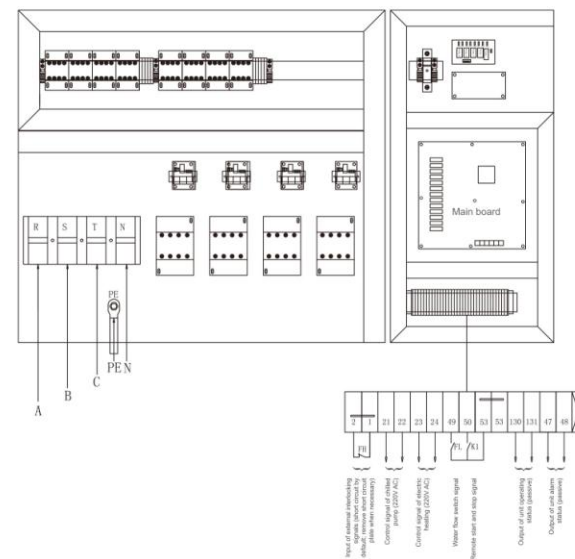


Model TAS-AH/C4	Code (mm)				Quantity of spring shock absorbers
	A	B	C	D	
280	2150	1300	—	—	4
330	2150	1300	1300	—	6
390	2150	1300	1300	—	6
450	2150	1200	1200	1200	8

★ Remarks

1. Foundation levelness $\leq 0.1\%$;
2. Foundation bearing capacity ≥ 1.5 times of unit operating weight;
3. Drainage is provided around the foundation to prevent water accumulation;
4. Shock absorber shall be installed between unit and foundation (shock absorber is skid-proof and rollover-proof, and needs not to be fastened to the foundation);
5. Spring shock absorber is optional, and before and after 7" are respectively models of shock absorber for cooling-only type and heat pump.

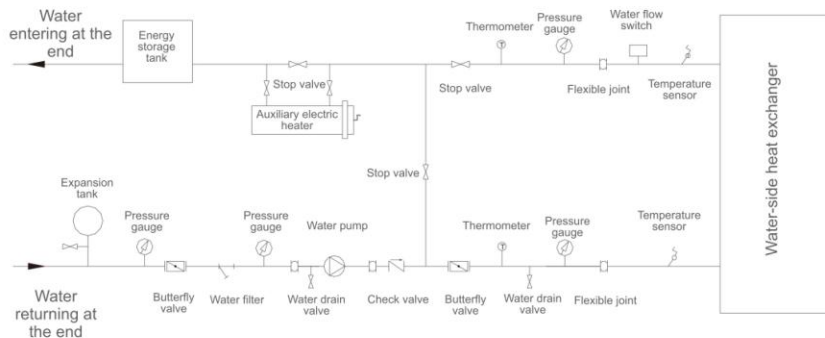
Field Wiring Diagrams



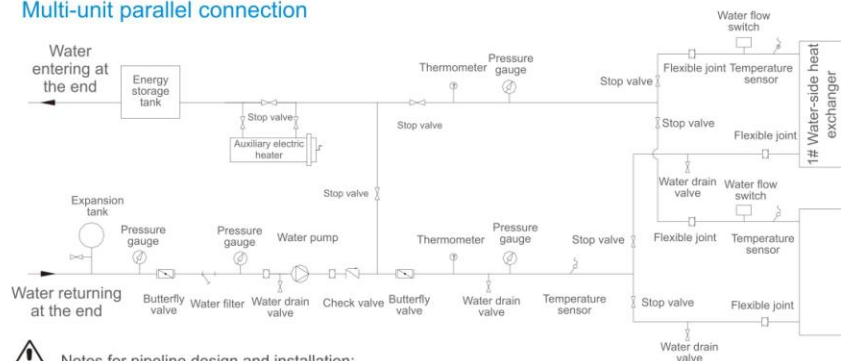
Note: The specifications of general power line must meet national regulations. To prevent dust entering into distribution box, a dust-proof shield or wire casing must be provided at the entry point of general power line after wiring work is done.

External Water Pipe Diagrams

Single unit



Multi-unit parallel connection



Notes for pipeline design and installation:

- When different modules are combined for integrated control, heat pump can not be combined with cooling-only type unit.
- Water cycling system shall be designed as simple as possible and avoiding too many elbows. Straight pipes shall be arranged on the same plane.
- Take heed of water inlet and outlet positions of heat exchanger lest any connection errors are made.
- Install manual or automatic air release valve at the top points of water cycling system.
- Expansion tank shall be anti-corrosive and rust proof and installed at the top points of entire pipeline system.
- Install thermometer and pressure gauge at water inlet and outlet positions.
- For dual-compressor units, a temperature sensing blind pipe shall be reserved at the general water pipe to install temperature sensor.
- Water drain valves should be installed at the bottom of elbows to make sure the water in the whole unit is emptied.
- Install stop valves at the pipeline connecting unit heat exchanger and user's water pipe.
- Install bypass valves between water inlet and outlet pipes of heat exchanger for future maintenance and pipeline rinsing.
- Install flexible joints to reduce vibration of pipelines.
- A filter should be installed before water pump because foreign matters in the water system may cause scale inside heat exchanger.
- To boost cooling (heating) performance and save energy, pipelines shall be completely insulated.
- To prevent frequent breakdowns of the unit caused by too small load, it is recommended to use energy storage tank.

