Warmfloor
THE TOTAL RADIANT HEATING SOLUTION

Installation & Operation Manual

of

Geothermal Heat Pump Units

For Water & Ground Source

Applications

FOR CFDY-S & CFDY-L SERIES

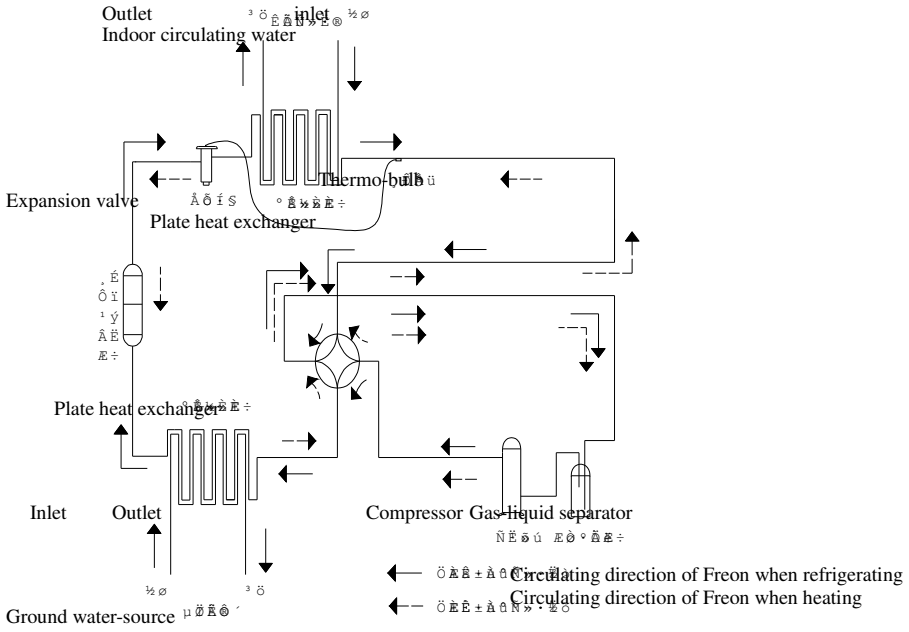
TOTAL COMFORT
CENTRAL HEATING SYSTEMS

Product Description

Heat pump based cold/hot water unit from underground source adopts heat exchange with underground sink rather than atmosphere by ordinary air conditioner. In summer, it produces 7°C cold water circulated through air conditioners in buildings by using well water as a big cooling condenser, saving 50% electricity than ordinary air-cooling heat pump based air conditioning system, hence the least power consumed cold water unit of central air conditioning. In winter, it produces 45-50°C hot water circulated through air conditioners in buildings by using well water as a big evaporator, hence a good solution of low efficient air conditioning in cold area. Besides, there are not any fuel, flue gas, waste gas/ash emission, pollution and noise. It is environment-friendly hot water boiler with minimal operation cost.

Heat pump based cold/hot water unit from underground source adopts the same principle as that from water source, utilizing underground heat and water medium. We call it underground heat pump based geothermic air conditioning if heat exchanged via buried tubes; water source heat pump based geothermic system if pumping water via wells.

Underground heat pump based cold/hot water units supply cold water in summer and hot water in winter, also a hot water boiler. We can tailor make small two purpose unit with built-in water tank to customers' requirement.



Principle diagram of water/ground source heat pump based cold/hot water unit.

Unit Specification

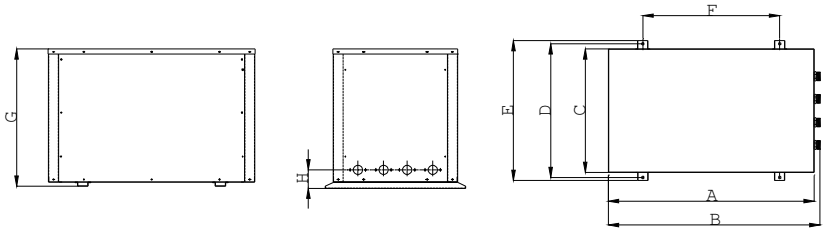
Test data: Refrigeration: cold water inlet 12°C, out 7°C; well water inlet 17°C, outlet 25°C.

Heating: hot water inlet 40°C, outlet 45°C; well water inlet 17°C, outlet 9°C

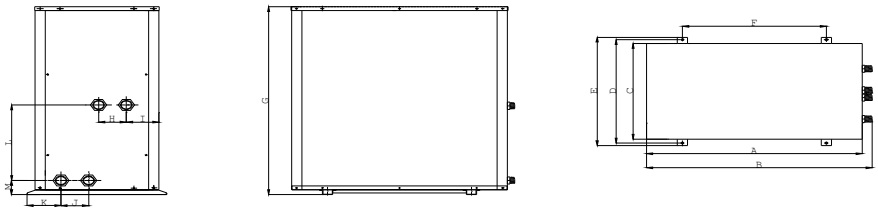
Model			CFDY-S4P	CFDY-S5P	CFDY-S6P	CFDY-S10P	CFDY-S12P	CFDY-S24P
Rfg't capa. kw			16	20	24	40	50	100
Rfg't power kw			2.6	3.0	3.6	6	7.5	15
Heat'g capa. kw			18	22	26	44	55	110
Heat'g power kw			3	3.7	4.5	7.4	9.2	18.4
Control			remote/line control, central auto control					
Safety Protect			H/L press. over-current, anti-frozen, missing/counter phase, H/L voltage, less flow					
Power supply			220V/50HZ			380V/50HZ		
Comp'r	Version		sealed rotation			volute compressor		
	No.		2	2	2	2	2	2
Ref'g	name		R22					
		Filling: kg	2.5	3.1	4	2×3.1	2×4	2×8
Cold/hot	type		Efficient inner spiral double tube evaporator					
	F	m^3/h	2.5	3.0	4	6	8	16
	D	mm	DN32	DN32	DN32	DN40	DN50	DN65
CW			Efficient inner spiral double tube evaporator					
	F	m^3/h	1.5-2.5	2-3	3-4	4-6	6-8	12-16
	D	mm	DN32	DN32	DN32	DN40	DN50	DN65
size	W	mm	1030	1030	1030	1100	1100	1770
	D	mm	680	680	680	680	680	1430
	H	mm	670	670	670	1185	1185	1400
Noise		dB(A)))	58	58	58	62	63	65
Weight		kg	148	153	158	248	260	360

Unit Dimension

Model: CFDY-S4P CFDY-S5P CFDY-S6P



Model: CFDY-S8P CFDY-S10P CFDY-S12P

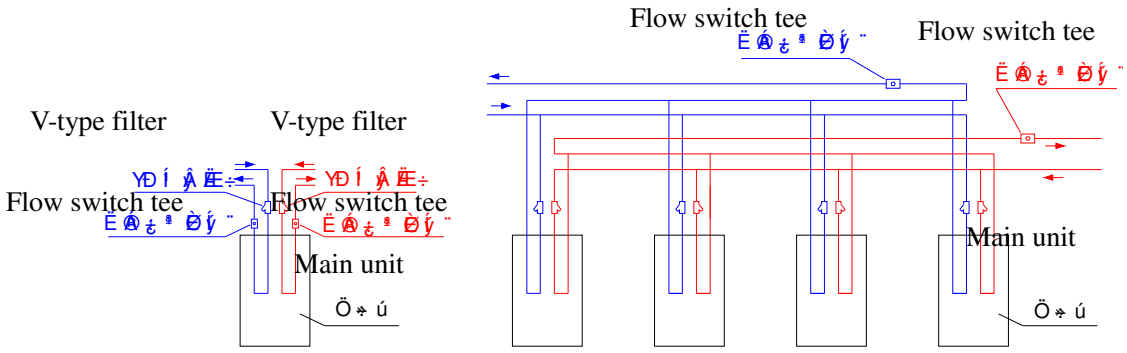


Dimensions of heat pump based cold/hot water unit:

Model	A	B	C	D	E	F	G	H	I	J	K	L	M
CFDY-S4P	1000	1030	600	650	680	670	670	90					
CFDY-S5P	1000	1030	600	650	680	670	670	90					
CFDY-S6P	1000	1030	600	650	680	670	670	90					
CFDY-S8P	1050	1100	600	650	680	700	1185	135	160	135	165	480	90
CFDY-S10P	1050	1100	600	650	680	700	1185	135	160	135	165	480	90
CFDY-S12P	1050	1100	600	650	680	700	1185	135	160	135	165	480	90
CFDY-S24P	1500	1560	700	650	680×	700	985	135	160	135	165	485	90

Installation of Water Circuit

1. Connect correctly CW and cold/hot pipeline per requirement, use SS hose to the unit for less vibration.
2. Should support water pipes separately, not leave the weight on this unit.
3. Install a drain valve at the lowest point of water system for easy discharge of residual water in the unit under repair.
4. Install an auto vent valve at the highest point of water system for continuous air purge during initial water makeup.
5. Install an expansion water tank at the highest point of water system or connect directly to running water.
6. After installation of water system, purge the system with clean water before connection to the unit.
7. Install a filter in the inlet water pipe of the unit; check and clean rubbish for smooth flow.
8. If combine several units together, install CW and cold/hot water pipe in parallel and supply equal water quantity from the same header for each unit. Design supply/return water header with suitable diameter for usually economic flow speed 2-2.5m/s.
9. Install flow valves, pressure gages and temp. Indicator at the places required for easy test and check.
10. Consider expansion and contraction when decide pipeline orientation and supports.
11. Install minimal elbows for less resistance in the system; consider accessibility of valves installed.
12. Perform hydraulic test at 0.6MPa for 30 minutes and start insulation if no leakage revealed in the system.



Single unit Multi-units

Installation scheme of heat pump based cold/hot water unit
From water/ground source

Underground Construction

Sufficient water source and suitable temperature can ensure efficient and stable operation of geothermic heat pump based air conditioning system. Better dig a well for water taking and return if possible because of high efficiency of convectional heat exchange in underground sand layer. Leave enough distance between supply and return wells. Utilize larger underground space as energy store and source by taking water from one well and returning water into several wells. Thus ensure water temp. in allowable range and long efficient operation in cooling or heating cycle of a year. Consumers in northern area should pay attention to underground heat balance due to longer heating and shorter refrigeration there. Our pumping equipment can achieve closed loop of equal water take/return by separation of gas and sand from water, hence easy water return for a long time.

Bury pipes for underground heat exchange if digging wells impossible. Based on local geological conditions, design and build underground heat exchanger with enough area and allowable temp. Range in cooling or heating cycle of a year.

Enclosed heat exchange for water take/return Close-loop heat exchange system vertically buried

Installation of Main Unit

1. Place the main unit properly on a strong base e.g. indoor/outdoor platform, courtyard ground at least 100mm higher than grade level against rain intrusion. Leave enough space around the unit for easy pipe fitting and regular service.
2. Erect the unit on solid base and provide rubber damper as necessary for least vibration or noise.
3. Erect the unit far away from electromagnetic source for least signal interference.
4. Connect water pipes correctly per labels on inlet/outlet of the unit.
5. Before unit commissioning, start water pump for proper flow and then connect pipes and power cable.

Safety measures

- Only qualified electricians can do electrical installation. Separately supply electricity to the unit, not share power source with others to avoid any failure caused by abnormal operation of others.
- Provide proper grounding and creepage protector for the unit against possible electric shock injury.
- Consider suitable design margin for power circuit capacity. Make electric terminals and joints strong without external force against any accident caused by bad connections.
- Switch off electrical equipment before hand repair. Never operate air conditioners with wet hands or wash them with water against electrical shock.
- In case of cooling medium leakage during installation, start ventilator immediately.
- All electrical control elements and protector received strict test in the

workshop. Users shall not alter or remove any of them for inspection or repair against serious damage to the unit without protection.

- Never use reset button simply in the case of fault indication. Shoot troubles first and then restart the unit. Otherwise the user shall undertake full responsibility.
- Switch off and stop electrical equipment in case of any fire accident or electric shock of people.
- Only competent workers can perform relocation or maintenance of the unit.

Caution

1. Ensure that lifting device can hold the machine weight. Use soft cables and cushions against distortion.

2. Handle the unit as vertically as possible within 15 degrees because it's filled with refrigerant.

3. Put protection caps on inlet/outlet pipe ends after open package against intrusion of small animal/debris.