



ADVANCE COOL TECHNOLOGY CO.,LTD.

AIR SOURCE HEAT PUMP



THE CHILLER EXPERT

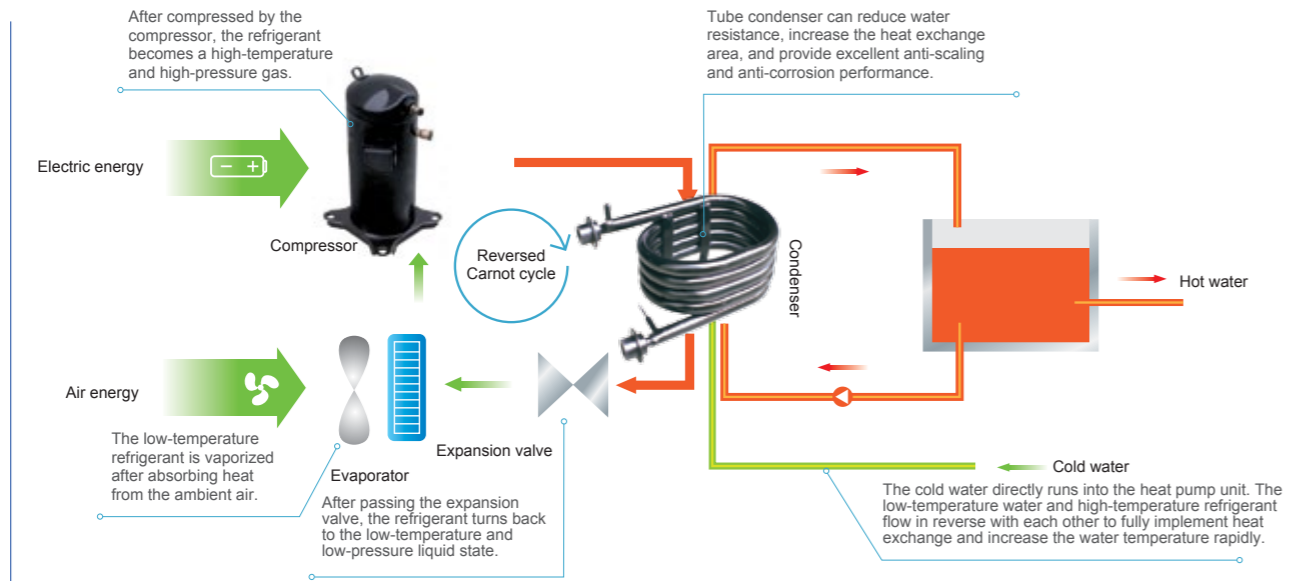
Advanced Design, Smart Life

Intelligent Technology
Better Life

Directly-heated type circulating technology



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Working Principle of Air Source Heat Pump Water Heater

Integrated Intelligent Control, More Energy Efficient

The intelligent centralized control mechanism manages all components of the water-heating system. Through intelligent analysis and calculation, it achieves real-time and precise control over each water heater unit and adjusts the working status of the system accessories correspondingly. In this case, unit efficiency is improved and energy consumption for the operation of the system accessories is reduced, saving users considerable operating costs.

Control over heat pump unit

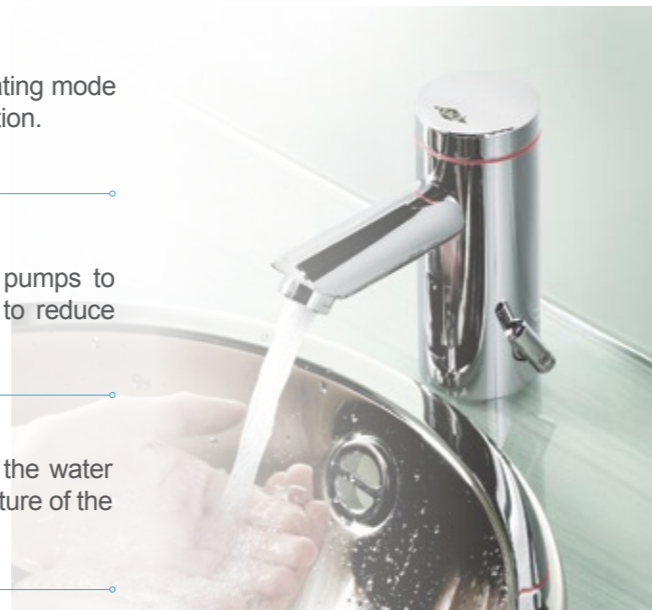
One-key startup, automatic judgment on operating mode of heat pump unit, and power-off memory function.

Control over water pump

Controls the startup and shutdown of water pumps to adapt to the current operating condition and to reduce power consumption of water pumps.

Control over water tank

Directly sets and controls the temperature of the water tank and monitors the water level and temperature of the water tank in real time.



Solenoid valve

A solenoid valve of internationally renowned brand is used to maintain smooth hot water flow in the pipes, guaranteeing the stable operation of the unit.



Fan

The unit adopts an axial flow fan with low noise, low power consumption, and high efficiency. Designed to be waterproof, the unit meets all requirements of outdoor use, durable and reliable.



Evaporator

The fin tube evaporator uses hydrophilic aluminum foils and inner grooved copper tubes to ensure fullest heat exchange between the refrigerant and ambient air and efficient heat exchange on the air side.



Electronic expansion valve

An electronic expansion valve of well-known brand is used to serve as the throttle apparatus, ensuring that the unit operates normally when faced with load changes, defrosting, startup, shutdown and so on.



Thermostatic water valve

Imported with original packaging, the thermostatic water valve can adjust both the water temperature and water flow, ensuring that constant-temperature hot water is available upon startup.



Motor

The multi-gear motor, perfectly matched, can operate under a wide range of application environments.



Compressor

A flexible scroll compressor of world-renowned brand helps to create a perfect heating system based on the high-temperature and -pressure working conditions of the heat pump unit, ensuring stability and reliability.





Custom-made, Perfect Integration

ACT has distinguished experience in commercial water heating, from system design and equipment matching, to pipeline installation and operation debugging, and is capable of providing stable, energy-saving and efficient water-heating systems.



1 Designs the optimal system solutions based on customers' water heating demand and environmental conditions

2 Helps customers with accurate selection of water heating device



3 Determines the specifications and models of pipeline, water pump, water tank and other components and reasonably lay out the pipelines according to the field situation

4 Debugs system components carefully to ensure stable and efficient operation of the system



Continuous hot water supply keeps you worry-free during winter time



Dual inflow water adjustment, rapid heating, and constant-temperature outflow water

Innovative technology of dual water flow adjustment can achieve accurate adjustment according to water inlet temperature and flow rate, to provide high-temperature water rapidly, thus effectively solving the problem of slow-speed water heating that usually occurs to common heat pumps in winters; rapid charge of constant-temperature hot water during peak usage periods can be guaranteed. Furthermore, the water output and temperature are displayed in real time for convenient operation.

Slow frosting and fast defrosting ensuring continuous hot water supply

Poor design of heat pump units tends to cause repeated defrosting in winter, seriously affecting normal operation and leading to intermittent hot water supply. The improved evaporator can automatically adjust the refrigerant flow to slow frosting. Moreover, the 4-way valve reversing defrosting technology is employed to achieve more rapid and thorough defrosting, thereby increasing the efficient heating time of heat pump units in winter and ensuring continuous hot water supply.



Free from the impact of water pressure fluctuation

During winter, the water flow in heat pump units is relatively low and the water pressure fluctuation will cause sharp fluctuation in water temperature, or even trigger high pressure protection and stop the unit. Therefore, we use a thermostatic water valve to monitor and timely and accurately adjust the water flow and temperature, considerably improving the operating stability of the unit.



Professional integration capacity, stable system

We provide optimal custom-made solutions of water heating system and full-pack services covering installation and commissioning, ensuring project quality to provide customers with stable water systems.

Excellent Performance, Energy Efficient, Environmentally Friendly



Stable Operation

- Lower operating temperature - uses R410A refrigerant and can operate at temperatures as low as -10°C.
- Efficient defrosting - 4-way valve reversing defrosting, quick and without residue.
- Quick response - innovative thermostatic water valve performs multilevel adjustments according to water temperature and flow, enabling quick raise in water temperature.
- Stable water supply - very adaptable water supply pressure allows water supplement without shutdown of unit.



High Energy Efficiency

- Internationally renowned and highly efficient compressor to ensure efficient, stable and reliable operation of the heat pump unit.
- Heat in the air is fully utilized to heat water based on the reversed Carnot cycle; direct-heating circulating technology facilitates efficient heat exchange between refrigerant and water, and complies with national energy-saving standards.

User-friendly

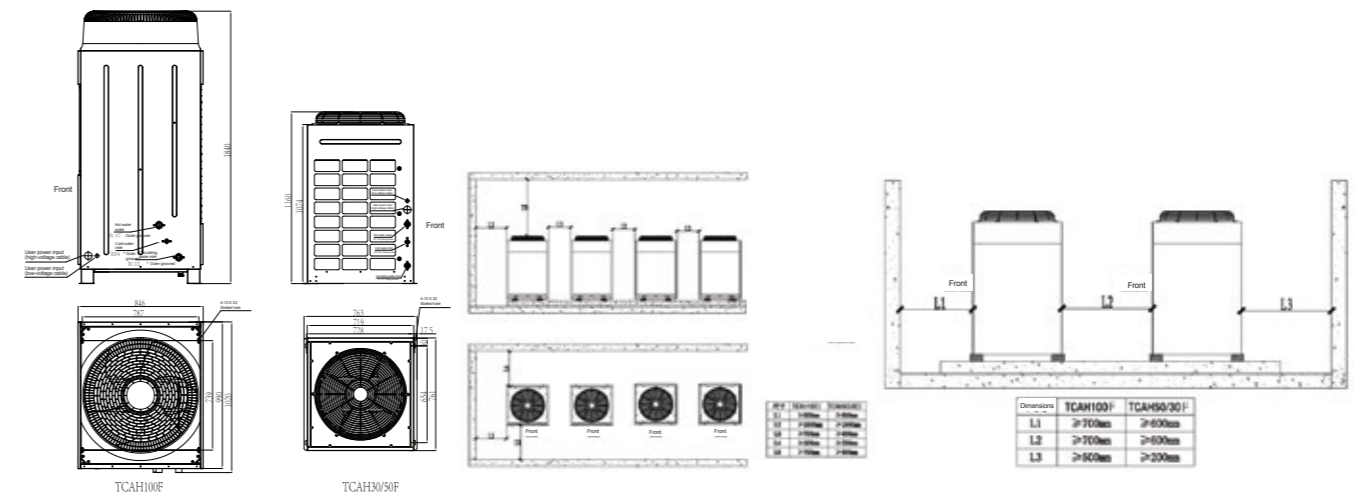
- Centralized control - intelligent control over the modular operation of multiple units concurrently, and includes the water pump, water tank and other system components in the monitoring coverage, so that the entire water heating system runs accurately and coordinately.
- Intelligent adjustment - automatically adjusts water temperature in winter and summer, and operates energy-efficiently.
- Automatic operation - can provide E-heater control signals, operates automatically and energy-efficiently.

Safe and Reliable

- Water and electricity isolated from each other, safer for use.
- Branded and quality components
- Extreme operating conditions, reliable operation
- Multiple protection, stable and durable



Dimensions



Model	Unit Dimensions	Packaging Dimensions
TCAH100F	1020 × 846 × 1840mm	1150 × 920 × 2045mm
TCAH50F / TCAH30F	763×761×1160mm	869 × 926 × 1360mm

Performance Parameter

	Model	TCAH100F	TCAH50F	TCAH30F
One-time heating	Nominal heating capacity (kW)	42	21	14
	Rated input power (kW)	9.54	4.88	3.25
	Rated current (A)	17.6	8.8	15.5
	COP (W/W)	4.4	4.3	4.3
	Nominal water output (m³/h)	0.902	0.451	0.301
	Highest water outlet temperature (°C)	60	60	60
Circulating heating	Nominal heating capacity (kW)	38	19.8	10.8
	Rated input power (kW)	10.3	6.02	3.3
	Rated water flow (m³/h)	6.5	3.4	1.86
	Maximum water inlet temperature (°C)	50	50	50
	Pressure loss at circulating water side (kPa)	45	80	80
	Entire unit	Power supply	380V 3N~50Hz	380V 3N~50Hz
Operating voltage range		380 ± 10%	380 ± 10%	220 ± 10%
Maximum total power (kW)		13.2	6.8	4.4
Maximum running current (A)		23.3	11.7	21
Applicable ambient temperature (°C)		-10 ~ 48	-10 ~ 48	-10 ~ 48
Noise (dB(A))		65	60	60
Maximum allowable pressure at the high pressure side (MPa)		4.2	4.2	4.2
Maximum allowable pressure at the low pressure side (MPa)		3.1	3.1	3.1
Maximum allowable pressure at the high pressure side (MPa)		1.0	1.0	1.0
Refrigerant/filling quantity		R410A/5.2kg	R410A/2.4kg	R410A/1.5kg
Waterproofing grade		IPX4, applicable to outdoor applications	IPX4, applicable to outdoor applications	IPX4, applicable to outdoor applications
Protection class		I	I	I
Climate type		Common	Common	Common
Cold water inlet pipe diameter (outer grooved)		DN20 (R3/4")	DN20 (NPT 3/4")	DN20 (NPT 3/4")
Hot water outlet pipe diameter (outer grooved)	DN40 (R1 1/2")	DN32 (R1 1/4")	DN32 (R1 1/4")	
Circulating water inlet pipe diameter (outer grooved)	DN40 (R1 1/2")	DN32 (R1 1/4")	DN32 (R1 1/4")	
Net weight (kg)	287	170	153	
Gross weight (kg)	310	195	178	

Note:

- Nominal heating capacity test conditions for one-time heating: outdoor dry/wet bulb temperature is 20/15°C; water inlet temperature is 15°C; water outlet temperature is 55°C.
- Models, parameters and performance due to product improvement may change without notice. Please refer to the nameplate parameters and real product.
- Nominal heating capacity test conditions of circulating heating: outdoor dry/wet bulb temperature is 20/15°C; water inlet temperature is 47°C; water outlet temperature is 52°C.
- The parameters are for reference only when selecting models.

Table of Variable Working Condition Parameters

Ambient Temperature (°C)	Water Inlet Temperature (°C)	Water Outlet Temperature (°C)	TCAH30F Heating Capacity (kW)	TCAH50F Heating Capacity (kW)	TCAH100F Heating Capacity (kW)
-10	9	45	0.543	0.547	0.594
-7	9	47	0.594	0.573	0.649
2	9	50	0.730	0.741	0.767
7	9	51	0.833	0.842	0.868
20	15	55	1.000	1.000	1.000
27	15	55	1.081	1.085	1.159
35	29	55	1.161	1.129	1.249
43	29	55	1.226	1.173	1.305
48	34	55	1.277	1.270	1.293

Model	Water Inlet/Outlet Temperature Difference (°C)	Ambient Temperature (°C)								
		-10	-7	2	7	20	27	35	43	48
		Water output	Water output	Water output	Water output	Water output	Water output	Water output	Water output	Water output
TCAH30F	30	0.653	0.790	0.938	1.043	1.333	1.383	1.449	1.416	1.387
	35	0.560	0.677	0.804	0.894	1.143	1.185	1.242	1.213	1.387
	40	0.490	0.593	0.704	0.782	1.000	1.037	1.086	1.062	1.214
TCAH50F	30	0.729	0.833	1.009	1.161	1.333	1.477	1.081	1.562	1.682
	35	0.625	0.714	0.865	0.995	1.143	1.266	0.927	1.338	1.441
	40	0.547	0.625	0.757	0.871	1.000	1.108	0.811	1.171	1.261
TCAH100F	30	0.757	0.897	1.009	1.141	1.333	1.532	1.598	1.683	1.651
	35	0.649	0.769	0.865	0.978	1.143	1.313	1.369	1.443	1.416
	40	0.568	0.673	0.757	0.856	1.000	1.149	1.198	1.262	1.239



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