PRO

TICA®

Ark thermal ATW heat pump

R32 Split / R410A Split

CE

Established in 1991

TICA is a professional enterprise specialized in R&D, manufacturing, sales and services of environment cleaning and thermal energy utilization.

TICA is a national high-tech enterprise, a single leading enterprise cultivated by the Ministry of Industry and Information Technology, a national brand cultivation enterprise of the Ministry of Industry and Information Technology, and a vice chairman member of China Refrigeration and Air-conditioning Industry Association. It has a national-recognized enterprise technology center, an enterprise academician workstation, and a post-doctoral research workstation. Its projects cover Beijing Bird's Nest Stadium, Water Cube, Wukesong Indoor Stadium, PetroChina, Sinopec, State Grid, Nanjing Panda, Hangzhou Xiaoshan International Airport, Hainan Airlines Group, Shangri-La Hotel, Manila Ocean Park, Abu Dhabi Al Muneera, SM City in Philippines and Unilever, etc.

TICA is also the outstanding provider of central air conditioners for China's subway networks and has successfully served nearly 60 key subway lines in major cities such as Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu, Suzhou, Hangzhou and Tianjin. TICA is a professional supplier and service provider in China that specializes in system integration of clean environment. While for microelectronics, hospital operating rooms, biopharmaceutical industry and other professional purification areas, our market share has achieved over 40% in each.

TICA Quality For IAQ

TICA focuses on indoor air quality (IAQ) in clean environments. Product lines include return air purifiers, heat recovery ventilators, fresh air purifiers, air purifiers, as well as the clean air handling units and digital variable-capacity air handling units used in the professional purification field. Regarding core technology, TICA established an ISO class 1 super-clean environment integration system and won the first prize of CMIST.
TICA's product lines include modular chillers, VRF units, screw chillers, centrifugal chillers, and ORC low-temperature waste heat power generation systems. In 2015, TICA and United Technologies Corporation (UTC) established a global strategic joint venture cooperation relationship and acquired PureCycle, an ORC low-temperature power generation company owned by Pratt & Whitney under UTC. TICA obtained PureCycle trademarks and more than 100 patents and national copyrights. TICA's efficient centrifugal chillers, water-cooled screw chillers, and air-cooled screw chillers are manufactured with the technical license of Carrier under UTC.
TICA is characterized by excellent system integration capability. In the application of "Efficient Refrigeration System of Underground Railway Station", the integrated COP of the refrigeration room amounts to 6.0, and the research achievement reaches the international advanced level. In 2018, TICA merged and acquired an OFC central air conditioning enterprise ***SMARDT***.TICA's excellent system integration capability and the ***SMARDT*** OFC water chillers help increase the integrated COP of the efficient equipment room to 6.7 to 7.0.
TICA---We're striving.

TICA aims to build itself into a world-leading system integration supplier and service provider that specializes in clean environment and thermal energy utilization.


Nanjing Plant


Guangzhou Plant


Tianjin Plant


Chengdu Plant


Kuala Lumpur Plant

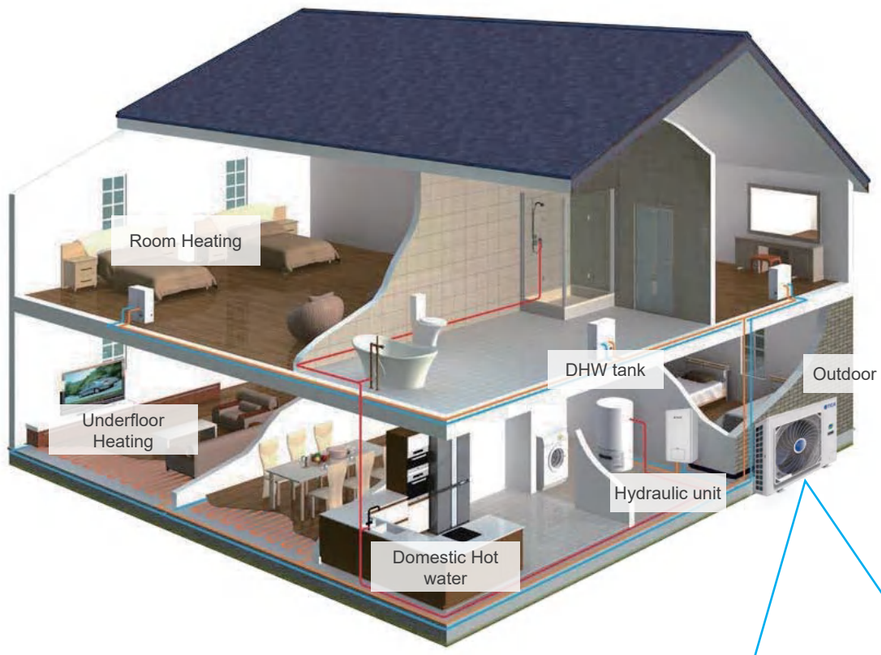
Smardt HQ, Montreal

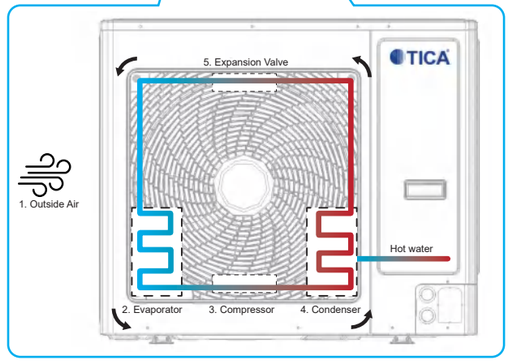

Energy Base

Content

What is Ark thermal ATW heat pump ?

A heat pump is part of a home heating and cooling system and is installed outside your home.They are powered by electricity and transfer heat using refrigerant to provide comfort all year round.





Ark Thermal Advanced Heating Technology

TICA air to water heat pump system has been specially designed to provide a space and domestic hot water solution to both new build and renovated homes. Even more remarkable thing is TICA advanced heating technology that can minimize energy consumption more than any other solution in the market.

Ark Thermal ATW split heat pump

The wide span systems with high efficiency can cover heating loads of various types of houses.

As the hot water efficiency becomes more and more important, TICA can provide an optimized solution for this.

TICA ATW split heat pump unit is a single device that can also provide a cooling solution besides the heating and hot water provided by boilers.

Ark Thermal R410A Series

Split 12~20kW

Product Overview

Product Lineup

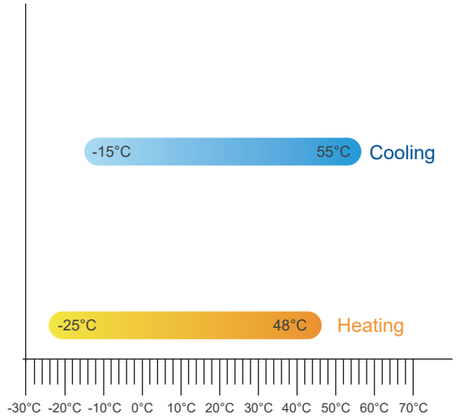
	Capacity(kW)	12	14	16	18	20
Split Outdoor unit	220-240V-1N-50Hz	●	●	●		
	380-415V-3N-50HZ				●	●

Overview

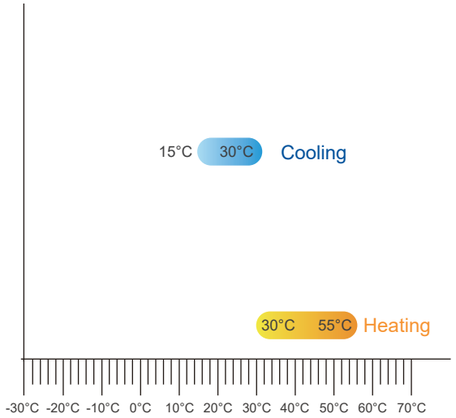
▼ Refrigerant R410A
▼ DC Inverter technology allows precise consumption on real load
▼ Maximum water temperature up to 55°C by heat pump
▼ Minimum operation ambient temperature down to -25°C
▼ High energy efficiency level A+++ for energy saving (Water outlet temperature at 35°C)
▼ Offers heating capacity of 100% at 7°C(Water outlet temperature at 35°C
▼ Provide space heating, cooling and domestic hot water(field supplied)

Wide Operation Range

Ambient temperature range



Leaving water temperature setting range



Compatible With Different Kinds of Terminals

Fan coil unit

Water tank (field supplies)

Floor heating loop

High Efficiency

One-Stop Configuration Upgrade

Upgrade 1

(Mitsubishi)

All DC inverter compliant enhanced vapor injection compressor

Match the running frequency smartly based on the load change in the air side.

Upgrade 2

(Grundfos of Denmark)

High-efficiency inverter screening water pump

Regulate the system water flow smartly based on the load change in the air side.

Upgrade 3

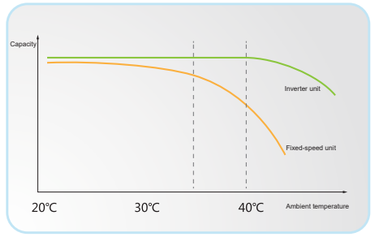
(Shibaura of Japan)

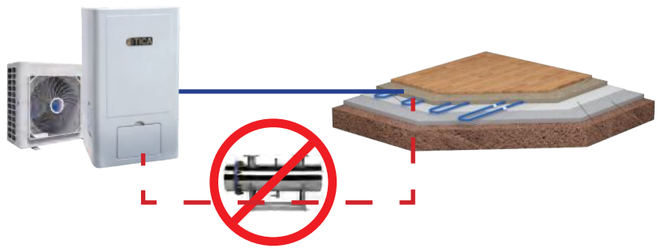
High-efficiency anti-interference inverter motor

Match the air flow smartly based on the load change in the air side.

All DC Inverter Vs. Fixed-Speed Compressor

Automatically regulate the unit frequency to meet the indoor capability requirements to the maximum extent while guaranteeing energy saving.



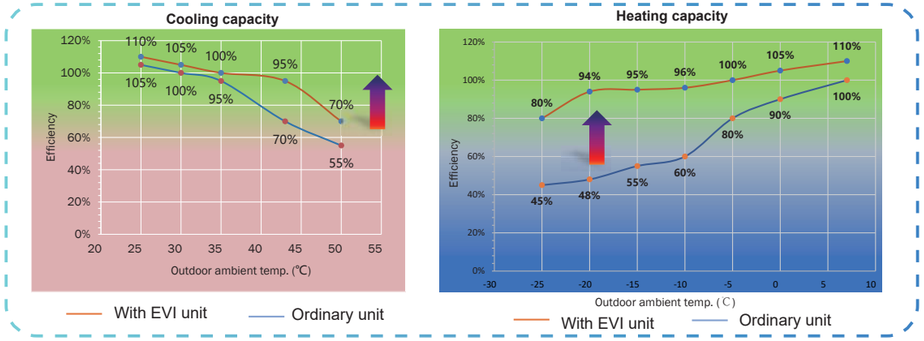


Electric heater is not required

Enhanced Vapor Injection Vs. Common System

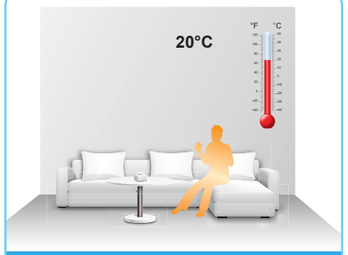
TICA's original all-condition enhanced vapor injection technology is used in Air to water split heat pump chiller, fully improving the unit running capability of cooling and heating. It easily implements cooling and heating in extreme conditions, with energy efficiency 20% higher than common units.

No electric auxiliary heat is needed in low-temperature environments in winter,saving more energy.

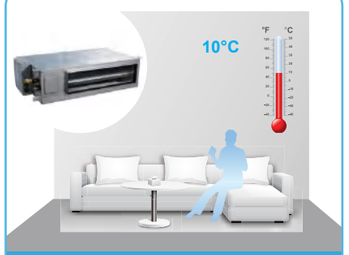


Superpower Heat Storage for Long-term Heat Preservation

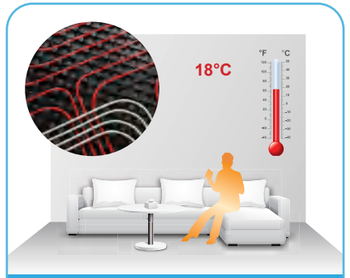
Air To Water Split Heat Pump Chiller taking water as the cool/heat carrier, provides a large heat capacity and powerful heat storage capabilities, beneficial for long-term heat preservation indoors. One hour later after the unit is powered off, the indoor environment temperature decreases by 2°C only.



Room with normal heating



One hour later after the unit is powered off Room heated by traditional air conditioner



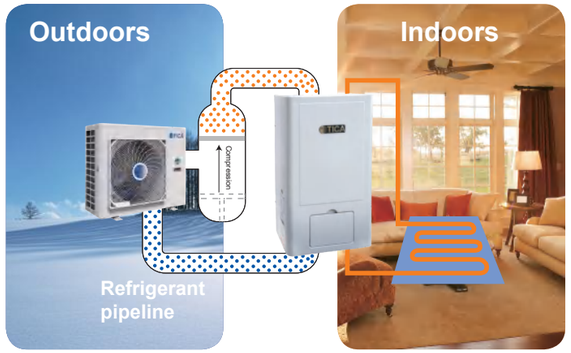
One hour later after the unit is powered off Room heated by Split heat pump

High Reliability

Multi-tier Anti-freezing for More Secure Water System

The unit implements anti-freezing detection based on the water flow, water temperature, and refrigerant temperature and provides three-tier anti-freezing procedures to prevent local freezing of water pipelines in winter. In addition, the unit adopts a separated structure to install the water system indoors, offering higher anti-freezing protection and more peace of mind.

Separated structure brings you peace of mind



Fast Defrosting for Efficient Heating

Intelligent Defrosting

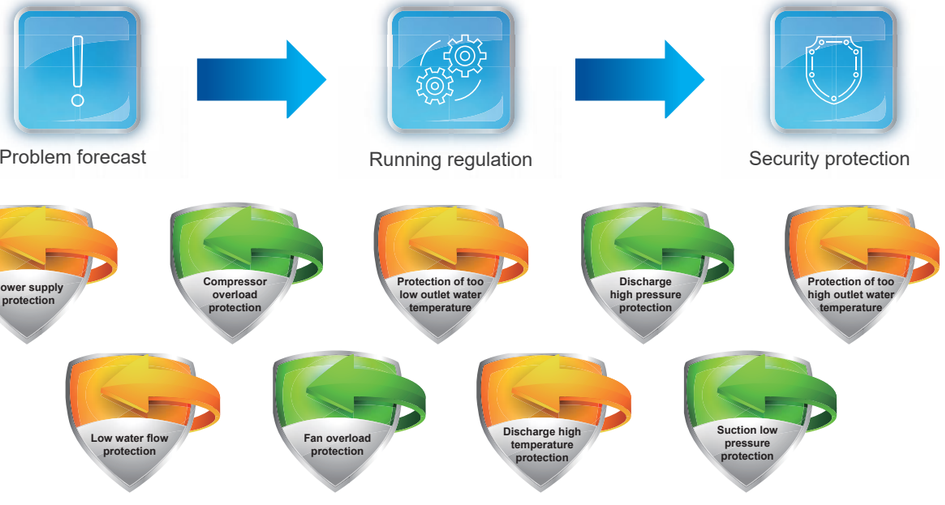
The unit intelligently determines whether to defrost based on the outdoor environment temperature and running status, to implement defrosting when frost exists and heating when frost does not exist, prevent mistaken defrosting, and improve heating efficiency to the maximum extent.

Powerful Defrosting

In severe conditions such as high humidity and low environment temperature, the unit automatically regulates to optimize defrosting effect, enhance heat exchange efficiency, and actively improve efficiency through powerful defrosting.

Comprehensive Security Protection for More Reliable Unit Running

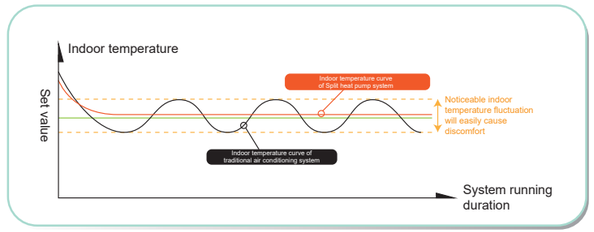
The unit provides various hardware protection and software protection for control functions, to forecast faults timely and regulate running status for unit reliability.



Comfort

Fast Cooling/Heating and Constant Room Temperature to Make You More Pleasant

After the air conditioner is powered on, the compressor rapidly starts and the unit operates at a high frequency to reach the set indoor temperature promptly. In addition, the system regulates the output of ODU and indoor water supply flow/temperature in real time based on the change of indoor load, to control the room temperature accurately. With Split heat pump full inverter air source chiller (heat pump), the room temperature fluctuates ±1°C, resolving the "unstable temperature" issue of traditional air conditioners and making you feel more comfortable.



Quiet Enjoyment and Better Household Experience

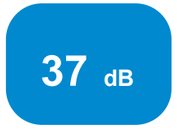
The unit uses 9-tier noise reduction technologies to effectively reduce the noise when the unit is started, runs in full load, and runs in partial load. Three silent modes provide more all-day noise reduction solutions for household life.

Smart day silent mode

Automatic night silent mode

Powerful night silent mode

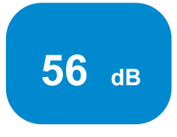
Peaceful suburb



IDU running

Library

Quiet office



ODU running

Chatting in living room

TIPS When floor heating is used in a radiation manner, because no moving parts such as fans and motors are installed indoors, nearly no noise is generated and family members can enjoy a peaceful space.

Convenience

Varieties of Control

Air to water split heat pump chiller is equipped with a full-touch LCD controller to easily implement integrated control of air conditioning and floor heating.

Operating mode

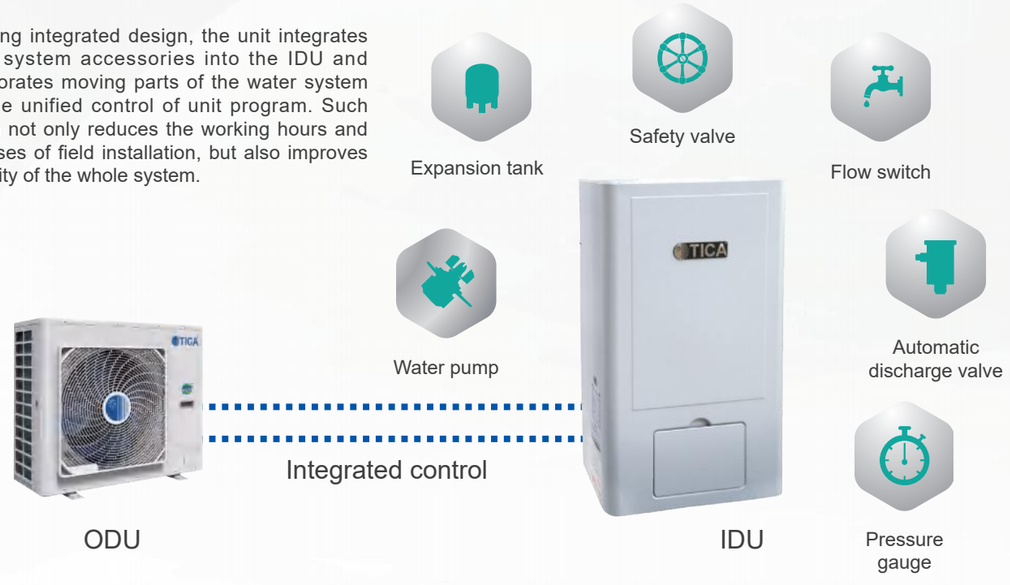
- Fan coil cooling
- Fan coil heating
- Floor heating
- Floor heat preservation

Regular function

- Outdoor environment Temperature display
- Time, date, and week display
- Room temperature setting and display
- Scheduled power-on/off
- Automatic startup upon power recovery
- Ultra quiet operation
- Powerful defrosting
- Error check
- Password setting

Integrated Design for Worry-Free Operation

Adopting integrated design, the unit integrates water system accessories into the IDU and incorporates moving parts of the water system into the unified control of unit program. Such design not only reduces the working hours and expenses of field installation, but also improves reliability of the whole system.



Smart Home

The unit provides standard RS485 communication interfaces and Modbus communication protocol to easily access the third-party building automation system and smart home central control system.

Specifications

Outdoor unit model			TSCA120FHL	TSCA140FHL	TSCA160FHL	TSCA180FHL	TSCA200FHL
Hydronic box model			TSCI120FHL(D)	TSCI140FHL(D)	TSCI160FHL(D)	TSCI180FHLD	TSCI200FHLD
Heating[1]	Capacity	kW	12.5	14.2	16	18.5	21
	Rated input	kW	3.2	3.74	4.26	4.31	5.07
	COP		3.91	3.8	3.76	4.29	4.14
Heating[2]	Capacity	kW	11.5	14	15.8	19	21
	Rated input	kW	3.32	4.36	5.02	6.07	6.82
	COP		3.46	3.21	3.15	3.13	3.08
Cooling[3]	Capacity	kW	12	13.5	14.5	18.5	22
	Rated input	kW	2.8	3.35	3.82	4.86	5.94
	EER		4.29	4.03	3.8	3.81	3.7
Cooling[4]	Capacity	kW	12	13.5	14.5	17.5	19.5
	Rated input	kW	4.24	5.01	5.56	6.22	7.29
	EER		2.83	2.69	2.61	2.81	2.67
Seasonal space heating energy efficiency class[5]	Water outlet at 35°C	class	A+++				
	Water outlet at 55°C	class	A++				

Notes:

1. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 30°C, Water outlet 35°C.
2. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 40°C, Water outlet 45°C.
3. Outdoor air temperature 35°C DB; Water inlet 23°C, Water outlet 18°C.
5. Outdoor air temperature 35°C DB; Water inlet 12°C, Water outlet 7°C.
6. Seasonal space heating energy efficiency class testes in average climate general.

Outdoor unit model			TSCA120FHL	TSCA140FHL	TSCA160FHL	TSCA180FHL	TSCA200FHL
Power supply		V/Ph/Hz	220-240/1/50			380-415/3/50	
Refrigerant	Type		R410A				
	Charged volume	kg	3.05	3.05	3.05	4.4	4.4
Sound power level		dB(A)	67	69	70	71	71
Net dimension (W×H×D)		mm	980×840×420			980×1260×420	
Net weight		kg	96	96	96	96	96
Pipe size O.D.	Liquid	mm	9.52	9.52	9.52	9.52	9.52
	Gas	mm	19.05	19.05	19.05	19.05	19.05
Connection method			Pipe socket				
Between indoor and outdoor unit	Height difference	m	Max.6				
	Pipe length	m	Max.25				
Ambient temperature range	Cooling	°C	-25~48				
	Heating	°C	-15~55				

Hydronic box model---wall mounted type			TSCI120FHL	TSCI140FHL	TSCI160FHL
Power supply		V/Ph/Hz	220-240/1/50		
Net dimension (W×H×D)		mm	520×892×245		
Net weight		kg	53	53	53
Water pump	Max. pump head	m	9.5	8.0	6.5
Connection	Water side	mm	External thread (R 1-1/4')		
	Refrigerant liquid	mm	9.52	9.52	9.52
	Refrigerant gas	mm	19.05	19.05	19.05

Hydronic box model---ceiling type			TSCI120FHLD	TSCI140FHLD	TSCI160FHLD	TSCI180FHLD	TSCI200FHLD
Power supply		V/Ph/Hz	220-240/1/50				
Net dimension (W×H×D)		mm	1000×220×500				
Net weight		kg	53	53	53	53	53
Water pump	Max. pump head	m	9.7	8.5	7.5	5.5	4
Connection	Water side	mm	External thread (R 1-1/4')				
	Refrigerant liquid	mm	9.52	9.52	9.52	9.52	9.52
	Refrigerant gas	mm	19.05	19.05	19.05	19.05	19.05

Ark Thermal
R32 Series

Split 4~16kW

Product Overview

Product Lineup

Split Outdoor unit	Capacity (kW)	4	6	8	10	12	14	16
	220-240V-1 N-50Hz	●	●	●	●	●	●	●
	380-415V-3N-50HZ					●	●	●

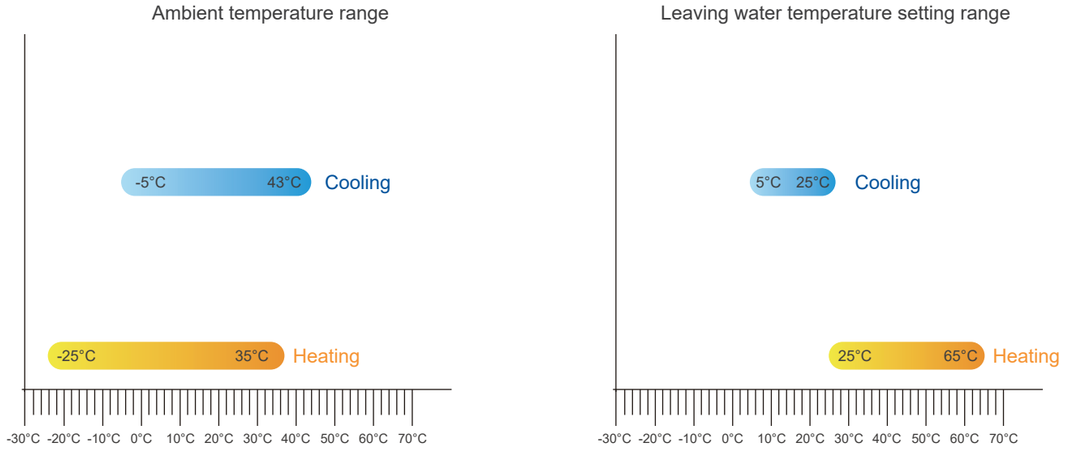
Split Hydronic box	Capacity (kW)	4	6	8	10	12	14	16
	220-240V-1 N-50Hz	●	●	●	●	●	●	●

Overview

Refrigerant R32 75% less impact on global warming
DC Inverter technology allows precise consumption on real load
Maximum water temperature up to 65°C by heat pump
Minimum operation ambient temperature down to -25°C
High energy efficiency level A+++ for energy saving (Water outlet temperature at 35°C)
Offers heating capacity of 100% at -7°C Water outlet temperature at 35°C;
Provide space heating, cooling and domestic hot water, total heat solution
Compatible with other heat sources such as solar panels and boilers

R32 A+++

Wide Operation Range



Compatible With Different Kinds of Terminals

Fan coil unit

Radiator

Water tank (field supplies)

Floor heating loop

High Efficiency

All DC Design

Compressor

DC Inverter compressor
- CE certification
- Twin eccentric cams
- Spray liquid cooling control
- Compact structure

Pump

DC inverter water pump
- CE certification
- High efficiency

Fan motor

DC Inverter fan motor
- CE/CCC certification
- BLDC fan motor with stepless control
- Quiet operation
- > Low power consumption

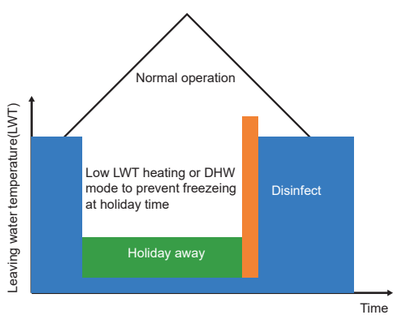
High Reliability

Preheating and Drying Up for Floor

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even ruptured during floor heating operation. We provide drying up mode which is used after the initial installation of floor loops and preheating mode for the first heating during seasonal heating in order to protect the floor. During the process, the water temperature would be increased gradually.

Holiday Away

Holiday away function is a mode for improving system reliability and saving energy. Unit operates in heating mode and/or DHW mode with low water temperature to prevent water from freezing in the winter during holiday outside. The user can pre-set , the disinfection mode before he returns home to make sure that germ-free water is available to be used when he returns.



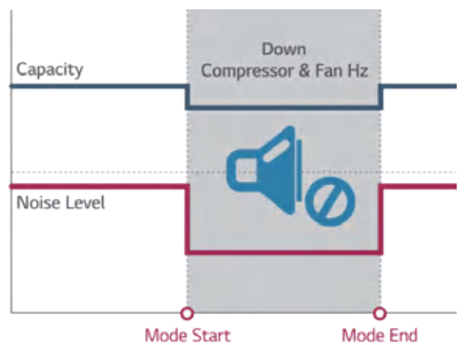
Comfort

Silent Mode

Multiple optimization design makes noise reduction:

Triple noise reduction

Silent mode decrease the sound effectively
Level 2 is more silent than level1.

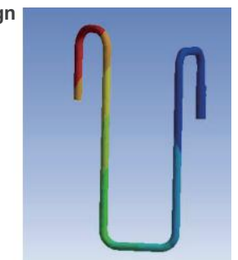


Twin rotary compressor

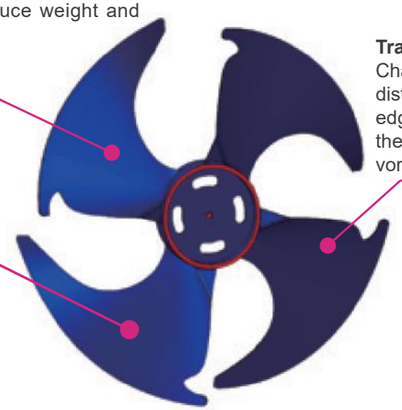
Bionic fan design

Suction surface concave design
Reduce the size of wake shedding vortex Improve the flow field on blade surface Reduce weight and improve efficiency

Trailing edge notch design
Change pressure distribution in the trailing edge of the blade Reduce the noise of blade wake vortex shedding



Leading edge thickening design
Reduce low frequency noise
Effectively improve the blade strength



Convenience

USB Function

Convenient program upgrade

No need to carry any other heavy equipments but only USB can realize program upgrade of indoor unit and outdoor unit.

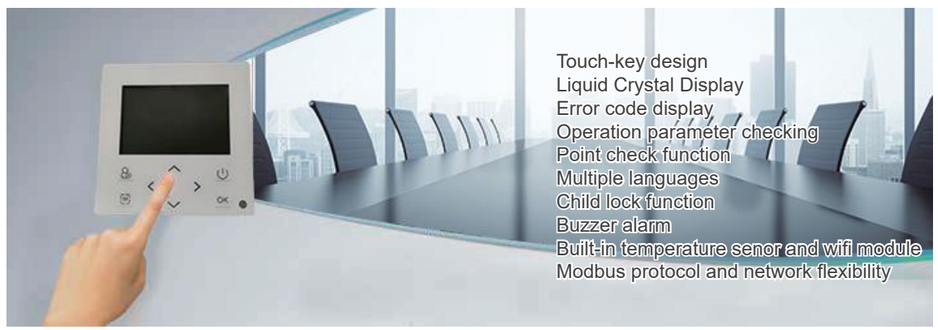
Parameter setting transmission between wired controllers

Installer can quickly copy the setting from one controller to another via USB, which save the time of on-site installation.

Holiday Home

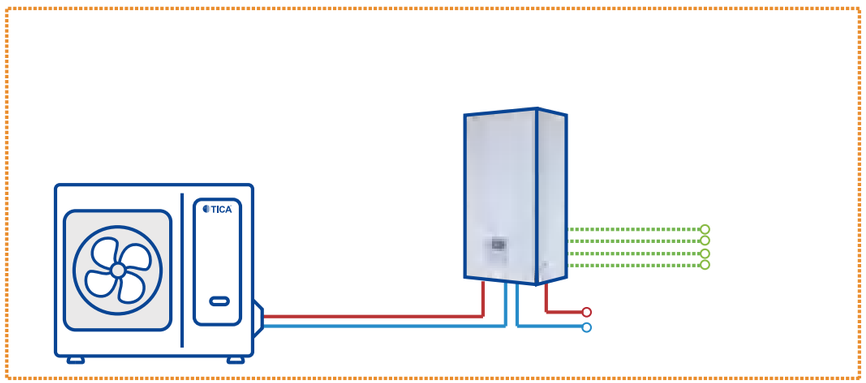
Holiday home function is used to deviate from the normal schedules without having to change them during the holiday at home.

Wired Controller



Typical Application

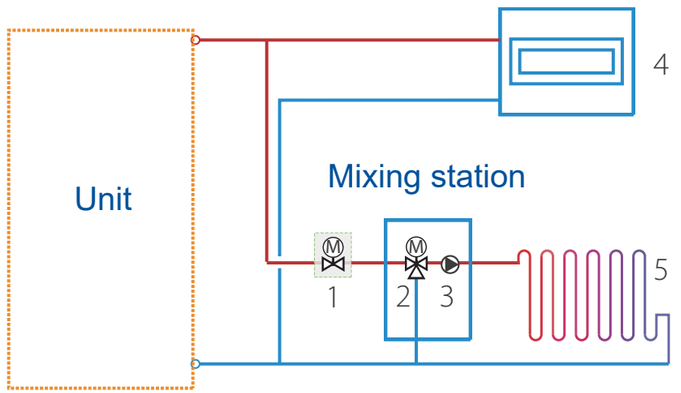
Practical applications are various, including but not limited to the following applications. The application examples given below are for illustration only.



Split(Outdoor unit + Hydronic box)

Heating and Cooling

Floor heating loops is used for space heating and fan coil unit is used for both space heating and cooling. For heating mode, floor heating loops and fan coil unit require different operating water temperature. To achieve these two temperature, a mixing station(field supplied) which is consists of 3-way valve and water pump is used to adapt the water temperature according to requirements of the floor heating loops. The mixing station is controlled by the unit. For cooling mode, 2-way valve is used to prevent cool water from entering floor heating loops then result in condensation during cooling.



Notes:

1. 2-way valve(field supplied)
2. 3-way valve(field supplied)
3. Water pump(field supplied)
4. Fan coil unit(TICA can supply)
5. Floor heating loop(field supplied)

Specifications

R32 Series Split

Outdoor unit model			TSCA 040JHL6A	TSCA 060JHL6A	TSCA 080JHL6A	TSCA 100JHL6A	TSCA 120JHL6A	TSCA 140JHL6A	TSCA 160JHL6A	TSCA 120JHLA6A	TSCA 140JHLA6A	TSCA 160JHLA6A
Hydronic box model			TSCI 040JHL6A	TSCI 060JHL6A	TSCI 080JHL6A	TSCI 100JHL6A	TSCI 120JHL6A	TSCI 140JHL6A	TSCI 160JHL6A	TSCI 120JHLA6A	TSCI 140JHLA6A	TSCI 160JHLA6A
Heating[1]	Capacity	kW	4.25	6.20	8.30	10.0	12.1	14.5	16.0	12.1	14.5	16.0
	Rated input	kW	0.82	1.24	1.60	2.00	2.44	3.09	3.56	2.44	3.09	3.56
	COP		5.20	5.00	5.20	5.00	4.95	4.70	4.50	4.95	4.70	4.50
Heating[2]	Capacity	kW	4.35	6.35	8.20	10.0	12.3	14.2	16.0	12.3	14.2	16.0
	Rated input	kW	1.14	1.69	2.08	2.63	3.24	3.89	4.44	3.24	3.89	4.44
	COP		3.80	3.75	3.95	3.80	3.80	3.65	3.60	3.80	3.65	3.60
Heating[3]	Capacity	kW	4.40	6.00	7.50	9.50	12.0	13.8	16.0	12.0	13.8	16.0
	Rated input	kW	1.49	2.00	2.36	3.06	3.87	4.60	5.52	3.87	4.60	5.52
	COP		2.95	3.00	3.18	3.10	3.10	3.00	2.90	3.10	3.00	2.90
Cooling[4]	Capacity	kW	4.50	6.55	8.40	10.00	12.00	13.50	14.2	12.00	13.50	14.2
	Rated input	kW	0.81	1.34	1.66	2.08	3.00	3.74	3.93	3.00	3.74	3[93
	EER		5.55	4.90	5.05	4.80	4.00	3.61	3.61	4.00	3.61	3.61
Cooling[5]	Capacity	kW	4.70	7.00	7.40	8.20	11.6	12.7	14.0	11.6	12.7	14.0
	Rated input	kW	1.36	2.33	2.19	2.48	4.22	4.98	5.71	4.22	4.98	5.71
	EER		3.45	3.00	3.38	3.30	2.75	2.55	2.45	2.75	2.55	2.45
Seasonal space heating energy efficiency class[6]	Water outlet at 35°C	class	A+++									
	Water outlet at 55°C	class	A++									
Hydronic box sound power level[7]		dB	38		42		43					

Notes:
1. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 30°C, Water outlet 35°C.
2. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 40°C, Water outlet 45°C.
3. Outdoor air temperature 7°C DB, 6°C WB; Water inlet 47°C, Water outlet 55°C.
4. Outdoor air temperature 35°C DB; Water inlet 23°C, Water outlet 18°C.
5. Outdoor air temperature 35°C DB; Water inlet 12°C, Water outlet 7°C.
6. Seasonal space heating energy efficiency class testes in average climate general.
7. Testing standard: EN12102-1.
8. Relevant EU standards and legislation: EN14511; EN14825; EN50564; EN12102; (EU) No 811/2013; (EU) No 813/2013; OJ 2014/C 207/02:2014.

R32 Series Split Outdoor Unit

Outdoor unit model			TSCA 040JHL6A	TSCA 060JHL6A	TSCA 080JHL6A	TSCA 100JHL6A	TSCA 120JHL6A	TSCA 140JHL6A	TSCA 160JHL6A	TSCA 120JHLA6A	TSCA 140JHLA6A	TSCA 160JHLA6A
Power supply		V/Ph/Hz	220-240/1/50							380-415/3/50		
Refrigerant	Type(GWP)		R32(675)									
	Charged volume	kg	1.50		1.65		1.84					
Sound power Level1		dB	56	58	59	60	64	65	68	64	65	68
Net dimension (WxHxD)		mm	1008x712x426		1118x865x523							
Packing dimension (WxHxD)		mm	1065x810x485		1190x970x560							
Net/Gross weight		kg	58/63.5		77/89		97/110.5			112/125.5		
Pipe size O.D.	Liquid	mm	6.35		9.52							
	Gas	mm	15.88		15.88							
Connection method			Flared									
Between indoor and outdoor unit	Height difference	m	Max.20									
	Pipe length	m	2-30									
Additional refrigerant	Chargment	g/m	20		38							
	Max. pipe length for no additional refrigerant	m	15									
Ambient temperature range	Cooling	°C	-5-43									
	Heating	°C	-25-35									
	DHW	°C	-25-43									

Note: 1.Testing standard: ENI2102-1.

R32 Series Split Hydronic Box

Hydronic box model			TSCI040JHL6A	TSCI060JHL6A	TSCI080JHL6A	TSCI100JHL6A	TSCI120JHL6A	TSCI140JHL6A	TSCI160JHL6A
Power supply		V/Ph/Hz	220-240/1/50						
Unit dimension (WxHxD)		mm	420×790×270						
Packing dimension (WxHxD)		mm	525×1050×360						
Net/Gross weight		kg	37/43		37/43		39/45		
Waterpump	Max. pump head	m	9						
Connection	Water side	mm	R1"						
	Refrigerant liguid	mm	6.35		9.52				
	Refrigerant gas	mm	15.88		15.88				
Backup E-heater2	Standard mounted	kW	/						
	Optional	kW	3/9		3/9		3/9		
	Capacity steps		1/3		1/3		1/3		
	Power supply 3kW	V/Ph/Hz	220-240/1/50						
	Power supply 9kW	V/Ph/Hz	380-415/3/50						
LWT setting range	Cooling	°C	5~25						
	Heating	°C	25~65						
	DHW	°C	30~60						

Note: 1.Testing standard: EN12102-1.
2. For three phase type backup electric heater, 3/6kW can be achieved by changing DIP switch when hydronic box is equipped with 9kW.

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