

TOSHIBA AIRCONDITIONING
Advancing the **eco**-evolution

Air to water Heat Pump System



The heating and cooling systems of the future!

A step in the right direction of reducing pollution and CO₂ emissions

The increase of CO₂ and other green house gases is a key concern.

Following the European commitment of reducing 20% of the emissions by 2020, energy waste from residential space heating and domestic hot water have been identified as the possible reduction targets.

Air-to-water heat pumps are considered as renewable energy technology compared to heating systems dependent on fossil fuel or non efficient electrical heating.

They are now considered as ideal solutions for space heating and domestic hot water.

Residential heat production by means of gas, oil or electricity contribute to raise the CO₂ emissions level in the atmosphere. In addition these traditional heating systems are less efficient and therefore the energy running costs increase.

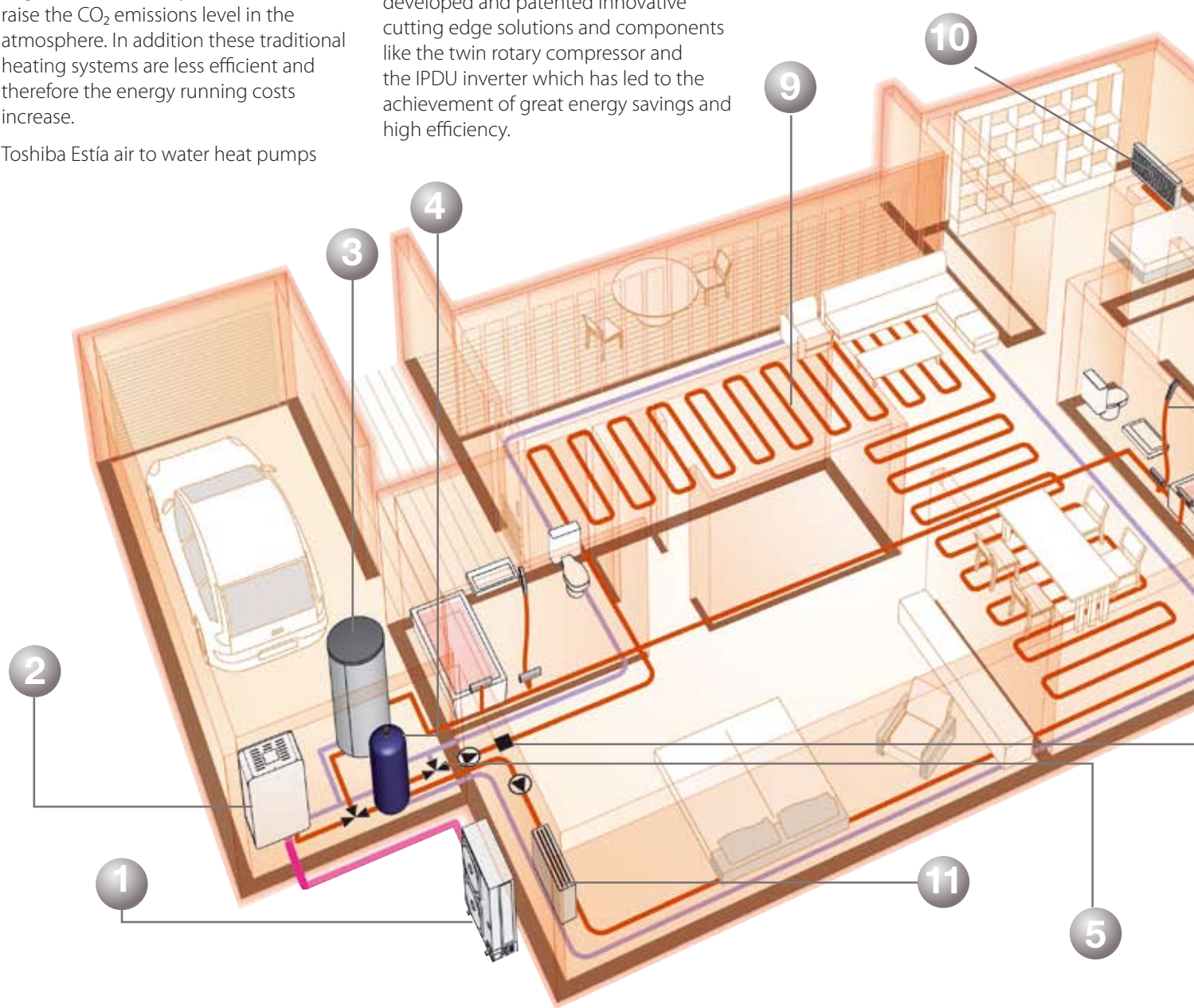
Toshiba Estía air to water heat pumps

are the ideal solution to increase energy efficiency (COP), using air as a main source of energy. This is an all in one system designed to deliver the right temperature for space heating, for domestic sanitary hot water and with the additional advantage of offering air conditioning in the warmer seasons.

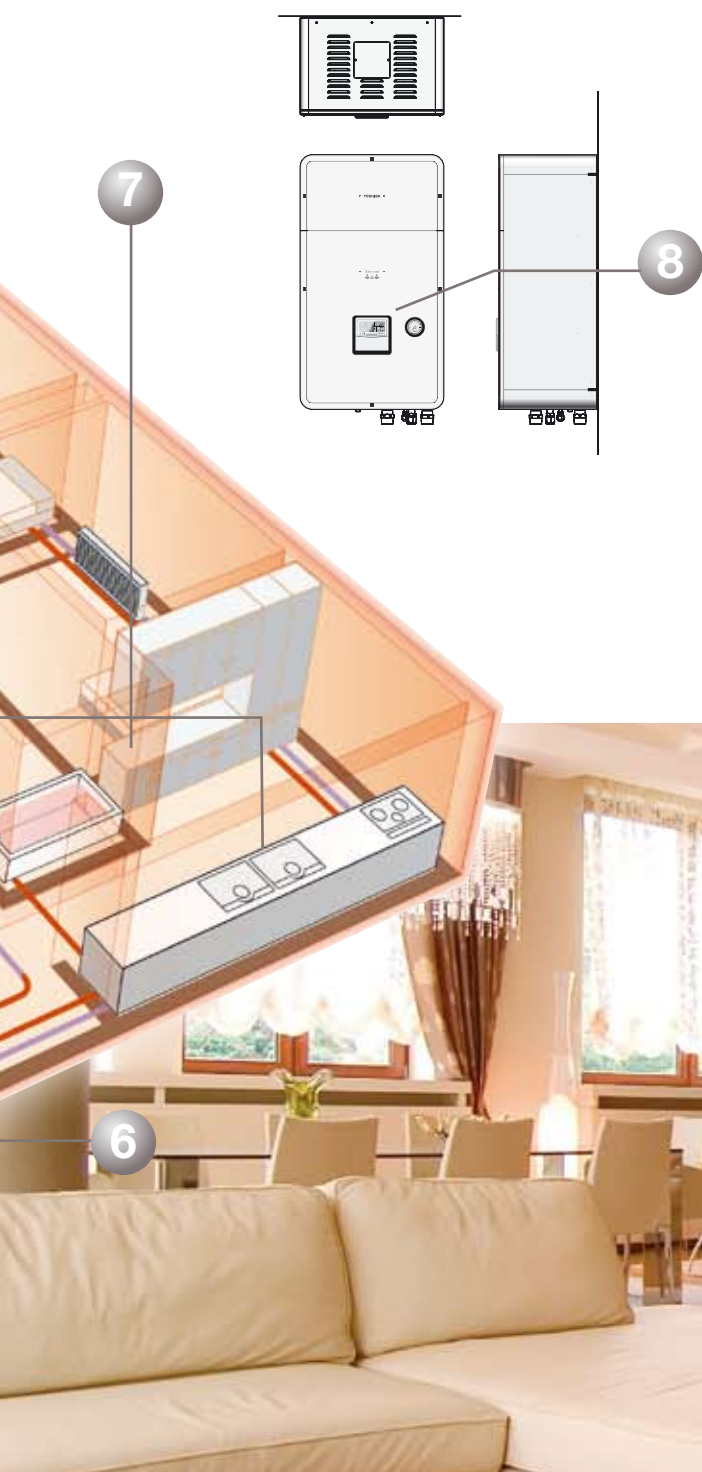
Toshiba air to water heat pump systems can manage two independent zones. This solution enables the delivery of water to diverse emitters at different temperature levels up to 55 °C.

This new technology enables greater energy savings and the use of the Toshiba high efficiency heat pump units ensure long term reliability.

Toshiba engineers in recent years have developed and patented innovative cutting edge solutions and components like the twin rotary compressor and the IPDU inverter which has led to the achievement of great energy savings and high efficiency.



1. Outdoor unit
2. Hydro unit
3. Domestic hot water tank
4. Buffer tank (local supply)
5. Mixing valve (local supply)
6. Temperature sensor
7. Hot water supply
8. Remote controller with weekly timer
9. Floor heating (local supply)
10. Low temperature radiator (local supply)
11. Fan coil unit (local supply)



Outdoor unit



Toshiba has a long term experience of successes in air to air heat pump production. The same reliable and award winning technology is at the core of the new air to water heat pumps. Above all the advanced inverter technology and the DC twin rotary compressor. Estia heat pumps operate with the reliable and safe R-410A refrigerant.

Hydro unit



The high efficiency plate heat exchanger receives the optimum quantity of refrigerant to produce hot water at low or medium temperature (20-55 °C), or cold water (10-20 °C). A back-up heater (3, 6 or 9 kW options) further supports the operation for extreme conditions. The hydro unit integrates the advanced control of water temperature to allow an optimized distribution to emitters and to the domestic hot water tank.

Domestic hot water tank



The Estia tank is a compact stainless steel insulated tank producing domestic hot water for sanitary use. The performance of the overall system is also maximized thanks to the integrated coaxial heat exchanger which uses hot water produced by the heat pump (whenever energy efficient and possible). With the optimized control logic, whenever additional hot water is needed, an internal electrical heater is activated. This solution reduces running cost and guarantees a constant level hot water temperature. Three storage capacities (150, 210 or 300 litres) meet any household requirements.

Controller with weekly timer



It controls the distribution of hot water for up to 2 zones and to the domestic hot water tank. The built in software logic collects the signals from the sensors, regulates the water temperature and optimizes the system's energy consumption. In addition the anti-bacteria control routinely increases the temperature in the domestic hot water tank. The easy to use remote control is conveniently attached to the hydronic unit. With its large and detailed display it is possible to visualize and set all the major operating parameters and also program the weekly timer.

Advantages



World-leading energy efficiency - COP of 4.66*

With its best in class COP performance, Estía air to water heat pump system delivers more heating power with less energy consumption.

Estía uses high quality components and material which contribute to the overall savings in energy consumption.

With the Toshiba advanced inverter, Estía air to water heat pump system only delivers the heating capacity required; thus consuming only the necessary electricity.

The hot water temperature is also optimized thanks to Toshiba advanced control depending on the outside air temperature. The milder outside, the air-to-water systems automatically produces lower water temperature to anticipate decreased needs of space heating. The same control logic allows to anticipate as well increasing heating needs when weather conditions become extreme; this overall temperature management gives the best conditions of comfort.

All this saving has a positive impact on the personal electricity bill and the whole community by reducing the CO₂ emissions in the atmosphere.



*11kW model

Easy to install

Quick and easy to install. The hydro module unit can be placed safely in the most suitable place within the house.

There's no need for chimney or underground captors which require additional works on site.

The compact outdoor unit can be placed anywhere outside the house or on a balcony, thanks to extensive piping options.



Environment conscious

The use of Toshiba Estía heat pump contribute to the reduction of global CO₂ emissions in the atmosphere and limit the use of fossil fuels or other non-renewable energy primary sources.

Whenever required for maintenance purpose, all the R410A refrigerant (non ozone depleting) can be completely sucked back to the outdoor unit through the powerful embedded Toshiba "pump down" operation.



One system, multiple solutions

Estía heat pump systems can be used in combination with different types of emitters: existing heating low temperature radiators, floor heating or fan coil units.



The right temperature at the right time

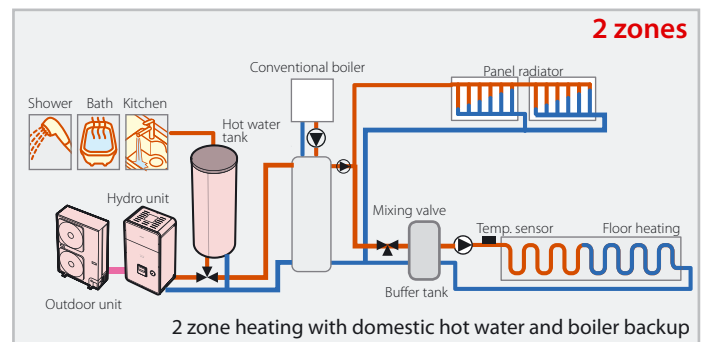
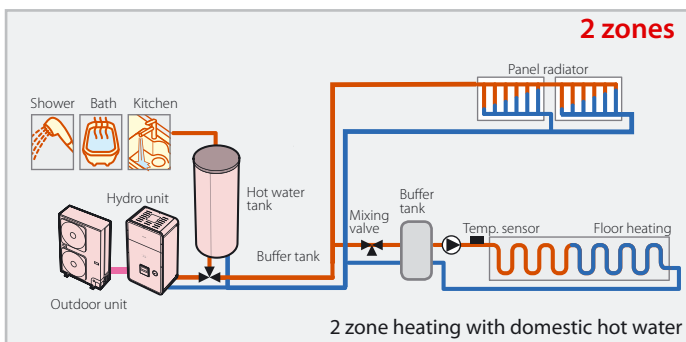
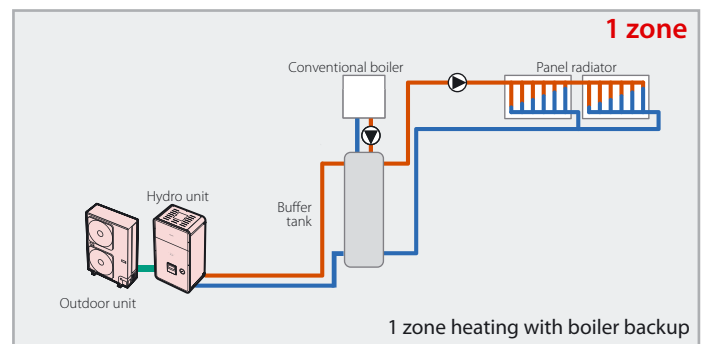
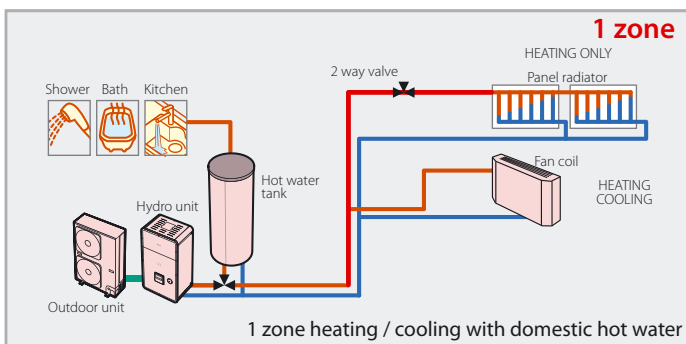
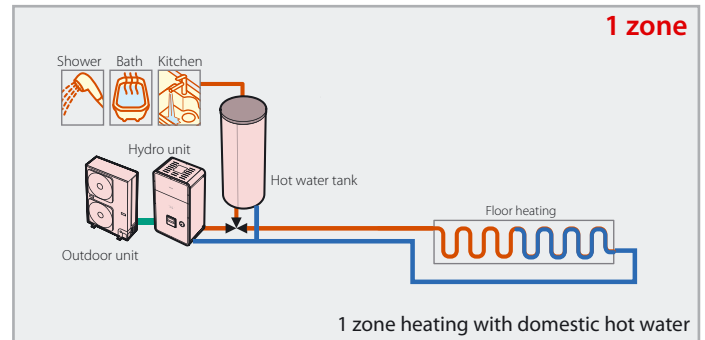
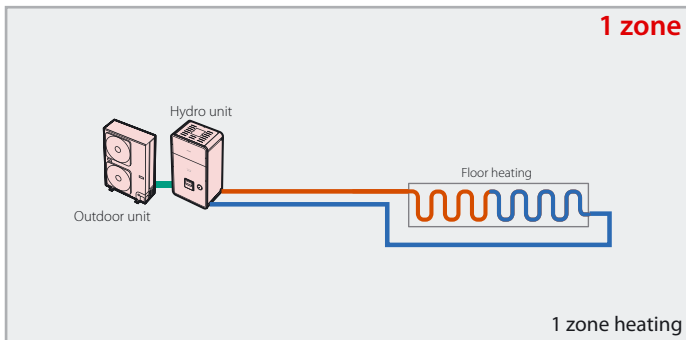
It can produce water at different temperatures for several applications simultaneously.

Toshiba Estía air to water heat pump system operates smoothly both with low outdoor air temperature down to -20 °C in winter and up to 43 °C in the summer season. The system has a unique anti-ice build-up protection embedded.



One system, full combination flexibility

For new houses or refurbishment Estía heat pump offers a variety of combinations, some examples are shown below:



In existing dwellings already equipped with traditional gas or fuel boilers, Toshiba Estía air to water heat pump system can be combined with the existing heating system to cover exclusively and in an optimized way all the heating needs, all year round. Then, the boiler is only used as a back-up source during some extreme weather days of the winter.

The intelligent Toshiba control balances the energy source in the most efficient way.



Everything under control

The remote controller is designed to be simple, intuitive and easy to use.

Two zones parameters can be controlled and displayed simultaneously. An area is also dedicated to the domestic hot water management settings and operations.

Timer control: it is possible to program the desired functions and day and night parameters for every day of the week (up to 10 actions/day).

Space heating management: select the operating mode for two different temperature zones, including the choice of automatic heat curve or constant water temperature.

Let's highlight 3 important functions:

Night operation: to automatically self-adjust the temperature during the night.

Frost protection: to enable the unit to operate flawlessly at very cold outside temperature.

Night quiet operation: reduces the noise level of the outdoor unit by 6 to 7 dB(A)*, highly appreciated in heavy residential area.

Domestic hot water settings: activates the hot water function. Plus two separate buttons, easy to use to immediately activate the following important functions.

Hot water boost: to quickly raise the domestic hot water temperature.

Anti bacteria function: at regular time interval and for a programmable period of time, the tank water is heated at high water temperature to kill the bacteria.

The display includes both icons and indications that let you easily visualize the operating parameters.

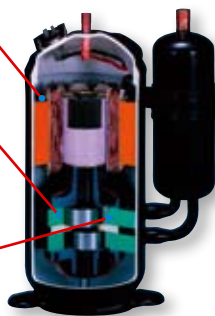
*In nominal conditions. Induces power delivery reduction.



Improved motor windings deliver greater motor efficiency

More effective compression thanks to high-precision parts

Flow channels re-designed to deliver more efficient compression



Toshiba advanced technology

Toshiba Inverter uses the new, vector controlled, Intelligent Power Drive Unit, which enables a wider range of frequencies and voltages.

The Toshiba DC Twin Rotary Compressor has a large capacity range operation, with an effective system of power limitation, which reduces the power consumption.

Performance is further improved by the high-speed converter circuit which calculates and optimizes the power supply to the compressor.

Savings in action

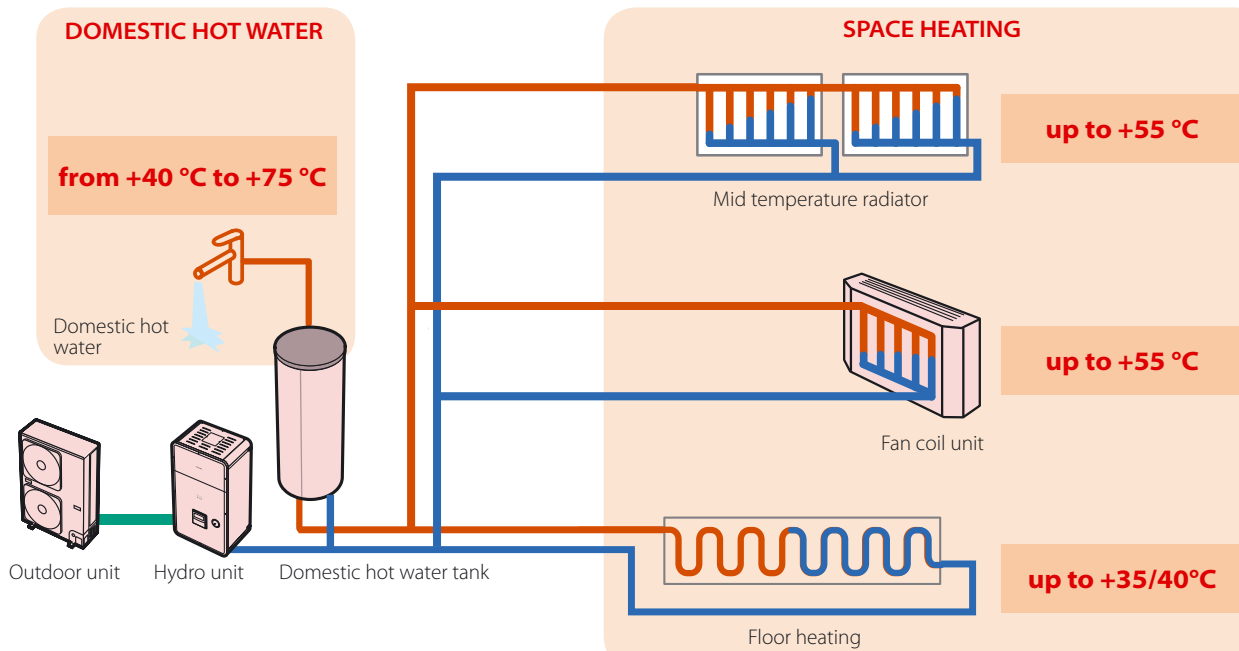
Incentives

Every country in Europe has already issued or is in the process of promoting incentives programs for the installation of heat pump systems.

Grants or tax rebates are calculated using the nominal COP as a reference, with progressively annual efficiency is entering into consideration. The installation of an Estía air to water heat pump system with top nominal COP and outstandingly high partial load COP thanks to its inverter DC Twin rotary compressor, guarantees to match most of the local governments requirements.



Hot water temperatures range



The installer can choose to set a constant temperature hot water set point or the heating auto curve control.

In autumn, when the outside air temperature is warm, it is not efficient for the Estía air to water heat pump system to operate at maximum hot water temperature. The heating auto curve control allows to set automatically the hot water temperature target, considering the outdoor conditions and thus optimizing the energy consumption of the heating system.

This outstanding energy efficient management is made possible thanks to the advance vectorial inverter control of the Toshiba outdoor unit devices.



Outdoor unit			HWS-802H-E	HWS-1102H-E	HWS-1402H-E
Hydro unit combination			HWS-802XWH**E	HWS-1402XWH**E	HWS-1402XWH**E
Nominal heating power*	kW		8	11,2	14
Power input	kW	H	1,96	2,4	3,15
COP energy efficiency	W/W	H	4,08	4,66	4,45
Nominal cooling power*	kW		6	10	11
Power input	kW	C	2,13	3,52	4,08
EER energy efficiency	W/W	C	2,82	2,84	2,69
Dimensions (h x w x d)	mm		890 x 900 x 320	1340 x 900 x 320	1340 x 900 x 320
Weight	kg		63	93	93
Sound pressure level	dB(A)		49	49	51
Compressor type			DC Twin Rotary	DC Twin Rotary	DC Twin Rotary
Refrigerant			R-410A	R-410A	R-410A
Flare connections (gas – liquid)			5/8" – 3/8"	5/8" – 3/8"	5/8" – 3/8"
Minimum pipe length	m		5	3	3
Maximum pipe length	m		30	30	30
Maximum height difference	m		30	30	30
Chargeless pipe length	m		30	30	30
Power supply	V-ph-Hz		230-1-50	230-1-50	230-1-50

C = cooling mode
H = heating mode

Technical specifications hydro unit

Hydro Unit			HWS-802XWHM3-E	HWS-802XWHT6-E	HWS-1402XWHM3-E	HWS-1402XWHT6-E	HWS-1402XWHT9-E
To be used with			HWS-802H-E	HWS-802H-E	HWS-1102H-E / HWS-1402H-E	HWS-1102H-E / HWS-1402H-E	HWS-1102H-E / HWS-1402H-E
Leaving water temperature	°C	H	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55	20 ~ 55
Leaving water temperature	°C	C	10 ~ 25	10 ~ 25	10 ~ 25	10 ~ 25	10 ~ 25
Dimensions (h x w x d)	mm		925 x 525 x 355	925 x 525 x 355	925 x 525 x 355	925 x 525 x 355	925 x 525 x 355
Weight	kg		50	50	54	54	54
Sound pressure level	dB(A)		29	29	29	29	29
Electric back up heater	kW		3	6	3	6	9
Electric back up heater	V-ph-Hz		230-1-50	400-3N-50	230-1-50	400-3N-50	400-3N-50

Technical specifications hot water tank

Domestic hot water tank		HWS-1501CSHM3-E	HWS-2101CSHM3-E	HWS-3001CSHM3-E
Water volume	l	150	210	300
Max water temperature	°C	75	75	75
Electric heater	kW	2,75	2,75	2,75
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50
Height	mm	1090	1474	2040
Diameter	mm	550	550	550
Material		Stainless steel	Stainless steel	Stainless steel

Accessories

Model	Function
TCB-PCIN3E	Boiler operation signal output, Alarm signal output, Compressor operation signal output, Defrost signal output
TCB-PCM03E	Room thermostat input, Emergency operation stop input

* The capacities in this catalogue are calculated based on following conditions:
Heating: Leaving hot water temperature: 35°C (ΔT 5°C). Outdoor air temperature: 7 °C DB / 6 °C WB.
Cooling: Leaving cold water temperature: 7°C (ΔT 5°C). Outdoor air temperature: 35 °C DB.
The sound pressure level is given at 1 m distance from outdoor units, and 1.5 m distance from hydro units.



Address, City
Phone, Fax
Mail
Site

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