aquanex
nex gen R32 inverter

HEAT PUMP WATER HEATER

MWH In-line Space Heating

temperzone
climate innovations

aquanex
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New Generation Temperzone In-line Systems

Heating Capacity
77.5kW - 154.3kW

ThermoShell®
technology

Inverter In-line
system

Innovative Heat Pump Water Heater Solutions

The future is here, Aquanex in-line design revolutionises the way heat pump water heaters are applied. Adapting an integrated whole system design ethos, Temperzone solutions deliver comfort and convenience that is more cost effective, efficient and extremely reliable.

Cost Effective Design

Temperzone In-line systems are designed to significantly reduce the installed system cost compared with traditional systems. In-line design delivers leaving water at the right temperature required for the application and has lower water flow rates. This eliminates the traditional requirement for larger pumps and larger piping diameters.

Better Performing Technology

Temperzone In-line system technology allows for substantial efficiency gains over traditional installations. This is achieved through a precise control of heated water supply for optimised heat absorption by the application. As the heating load of the application is met the MWH heat pump water heater reduces energy input and increases in efficiency.

Reliable Operation

Temperzone In-line systems are low maintenance, with low service requirements. Its ThermoShell® heat exchanger, unlike traditional heat exchangers, are fouling resistant. Also, the advanced unit controller combined with application specific design uniquely enables the compressor to constantly operate within its design limits improving unit life.

Applications

- Fan coil space heating
- Boiler replacement
- Radiator panels
- Fresh air tempering
- Process heating

Features

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Heat Pump Water Heater
(77.5kW - 154.3kW)

R32

ThermoShell® technology

Inverter In-line system

In-line Design
Directly delivers water at the required temperature removing the requirement for a intermediate water tank*

ThermoShell®
ThermoShell® heat exchanger non-fouling design for long life performance

Inverter Compressors
For superior part load performance and increased efficiency

Low GWP Refrigerant
R32 refrigerant has a significantly lower GWP than R410A

Electronic Expansion Valve
Electronic expansion valves for greater control and efficiency

Multi-speed Fans
Multi speed condenser fans for better efficiency and control

Marine Grade Powder Coating
Polyester powder coated with highly corrosion resistant pre-coating for long life durability

Intelligent Unit Controller
Ensures the unit runs at its optimum efficiency and provides system operation data

Low Ambient Temperature Operation
Operates down to -10°C ambient temperature

Local or 3rd Party Control
Operates with Temperzone local or 3rd party controllers

Epoxy Coated Coils
Corrosion resistant epoxy coated coils for long life coil protection

BMS
BACnet™ or Modbus via RS485 (or TCP/IP option)
*BACnet via PLC

*An inline tank may be required in cold regions where a minimum water volume is needed for de-ice operation and system volume does not meet minimum requirements. Refer application manual.

Lower Global Warming Potential Air Conditioning

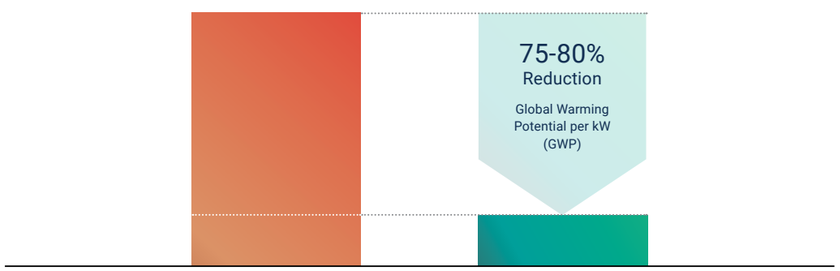
Leading the way in providing low GWP commercial R32 air conditioning solutions.

Lower global warming potential

Due to a smaller refrigerant charge and a reduced refrigerant GWP of 677, these R32 refrigerant systems represent a 75-80% reduction in overall GWP per kW of heating when compared to R410A systems (GWP 2088)*.

Reducing future costs

As higher GWP refrigerants face increasing cost due to emissions tax levies the specification of R32 systems will represent a significant reduction in the future costs associated with owning and maintaining these systems.



*AR4 Standard

General Operating Principles

Heat-pump water heaters are the most environmentally responsible and efficient water heating technology available on the market today, providing all season heating performance.

How does a heat pump water heater work?

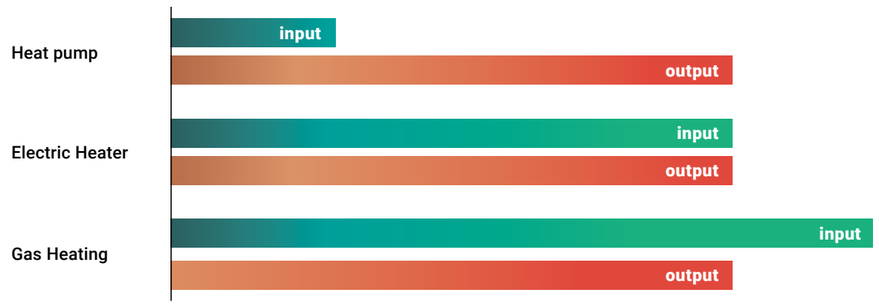
A heat pump water heater extracts energy from the air by boiling refrigerant based heat-transfer fluid. The refrigerant vapour is compressed which greatly increases its temperature. The high temperature refrigerant is passed through a heat exchanger where the energy is transferred from the refrigerant to the water causing the refrigerant to condense. The refrigerant is returned to a low energy state where it can repeat the cycle. Because a heat pump water heater uses electricity only to transfer energy from one place to another, it does so much more efficiently than converting the electricity directly to heat.

How efficient are heat pump water heaters?

Compared to electric element and gas water heaters, heat pump water heaters are much more efficient. Gas water heaters convert gas energy into heat through combustion, this process is typically only 70-80% efficient. Electric element heaters are 100% efficient converting one purchased unit of electricity into one unit of heat. Heat pump water heaters are generally 300-400% efficient converting one purchased unit of electricity into 3-4 units of heat. The graph below compares the relative energy efficiency of each the technologies.

Energy Efficiency Comparison

Comparative energy input and output for various heating technologies*.



*Conditions: 7/6°C db/wb outdoor ambient; EWT 30°C; LWT 45°C

Innovative Heat Pump Water Heater System

Designed to resolve the inefficiencies presented by current market products, Temperzone In-line heat pump water heater innovation improves the effectiveness and efficiency of integrated systems.

Temperzone In-line Advantage

Through the use of advanced variable capacity technology, integrated system design and control principles, Temperzone In-line heat pump water heaters offer industry leading energy efficiency and reliability.

Different applications have unique heating demand requirements the water heating system must deliver. Temperzone In-line systems directly provide the capacity required for the application eliminating the need for intermediate buffer tanks* and primary and secondary circuits. It does this by controlling the supply water temperature and varying the water flow rates to meet the required heating demand.

This approach reduces installed system capital costs, and significantly increases system efficiency, especially under part-load conditions, resulting in one of the most cost-effective water heating systems on the market.

*An inline tank may be required in cold regions where a minimum water volume is needed for de-ice operation and system volume does not meet minimum requirements. Refer application manual.

Main Benefits of Temperzone In-line Systems

Inverter In-line system

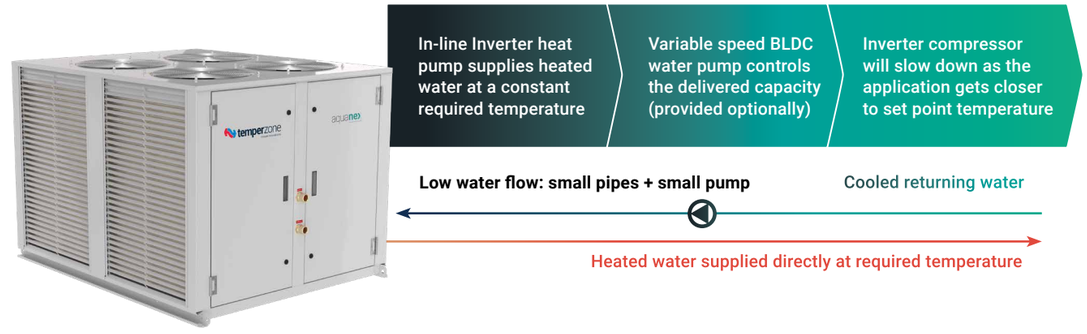
- Eliminates need for intermediate buffer tanks*
- Accommodates smaller piping diameter
- Reduction in required pump power
- Reliable long life system design
- Most energy efficient system
- Low service / maintenance

Efficient Temperzone In-line System

Temperzone In-line systems are inverter based variable capacity systems. The utilisation of inverter compressor technology, ThermoShell heat exchanger technology, advanced system controls and optionally provided variable speed BLDC pumps allows MWH systems to supply a constant supply water temperature to the application regardless of the ambient conditions and return water temperature.

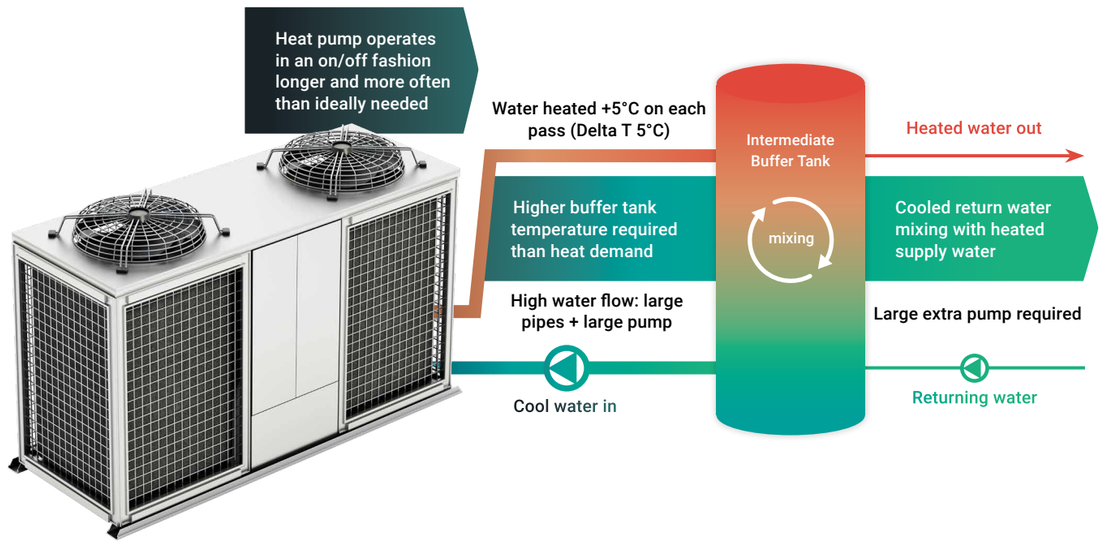
The BLDC variable speed pump (provided optionally) will control the delivered capacity by efficiently controlling the water flow rate. This integrated system design reduces capital costs and significantly reduces system energy consumption. Temperzone MWH units maintain a fixed supply water temperature of 25-55°C.

*An inline tank may be required in cold regions where a minimum water volume is needed for de-ice operation and system volume does not meet minimum requirements. Refer application manual.



Inefficient Conventional Systems

A conventional system is typically designed with a fixed speed compressor, large pump and large pipes. Water is continually cycled at high flow rates through the heat pump to be heated in increments of 5°C on every pass until the intermediate buffer tank reaches the set temperature.

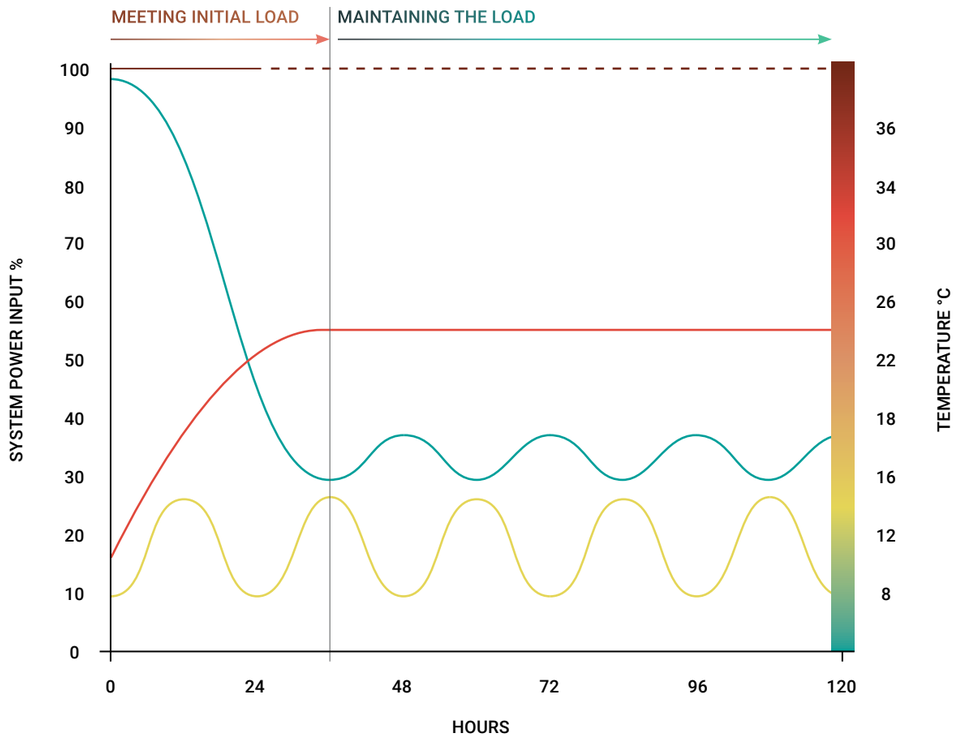


Superior Efficiency

A conventional heat pump, typically operates at high speed turning itself on and off as the intermediate buffer tank requires heating. This method is inefficient as the intermediate buffer tank must be overheated beyond the demand set point.

Temperzone In-line systems take full advantage of inverter compressor technology which increase in efficiency at part load operation.

The MWH inverter compressor, as the load is met, significantly reduces energy consumption by turning itself down to operate at part load while still maintaining the heating requirements of the application.



Variable Capacity Inverter Compressor

Inverter In-line system

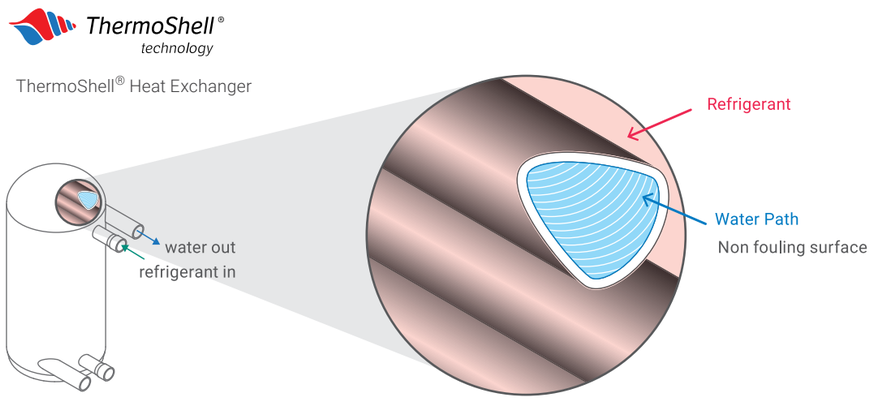
Highly efficient variable capacity inverter compressors allow Temperzone In-line systems to ramp up and down to deliver a constant leaving water temperature. Inverter compressors are extremely efficient when operating at part load. As the application gets closer to set temperature the Temperzone In-line system will slow the inverter compressor down to operate at part load and substantially reduce energy consumption.

Non Fouling ThermoShell® Technology

The Temperzone MWH Series applies the most appropriate technology for the application, and integrates advanced control logic to maximize heating system efficiency, energy delivery and unit reliability.

ThermoShell® Technology Heat Exchangers

Heat pump water heaters have at their core a refrigerant-to-water heat exchanger and its performance is critical to the overall performance of the system. Temperzone's ThermoShell® heat exchanger is designed to operate extremely efficiently under low water flow rates. This enables Temperzone In-line systems, which require lower water flow rates, to provide superior performance. Alternative heat exchanger designs are highly prone to fouling over time which reduces performance and greatly shortens the life of the system. Temperzone's ThermoShell® eliminates this fouling risk and guarantees the same performance year after year.



BLDC Variable Speed Pumps

Highly efficient optional variable speed pumps effectively control the heating capacity of the system by varying the water flow rate. The smart pump has a EC motor that reduces energy use by around 50%.

Enhanced Vapour Injection

Specially designed for colder climates, EVI technology provides the assurance that comfort levels will be maintained at low ambient temperatures.

How does EVI technology work?

In colder climates, the capacity performance of standard heat pumps is reduced when the ambient temperature drops to between +10 °C and -5 °C. EVI hardware works in combination with Temperzone's proprietary UC8 software, to inject vapour directly into the scroll plate of the compressor. The resultant cooling on the compressor provides increased capacity in cold conditions. EVI operation is controlled within the compressor envelope, ensuring both longevity and reliability of the compressor.

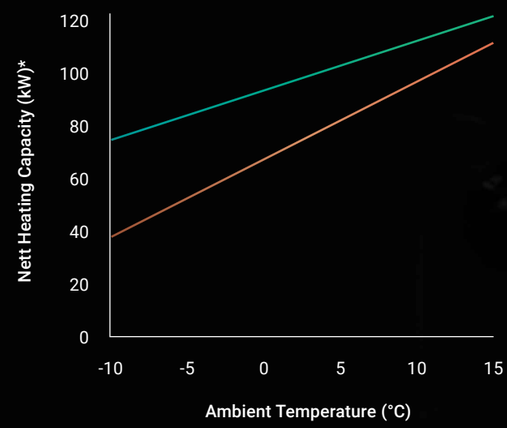
EVI Benefits

- All year round performance
- Increased capacity at low ambient temperature (down to -10 °C)
- Unlocks the full potential of the compressor
- Guarantees compressor protection under high loads

EVI Unit

Non EVI unit

*Nett capacity trend lines for MWH900 see technical data for gross capacities.



Reliability & Durability

1
Highly corrosion resistant epoxy coated coils to suit harsh climate conditions

2
Marine grade pretreatment and polyester powder coated galvanised steel, inside and out

3
Advanced integrated controls with full safety design integration

4
Maintenance-free non-fouling, long life ThermoShell® heat exchanger

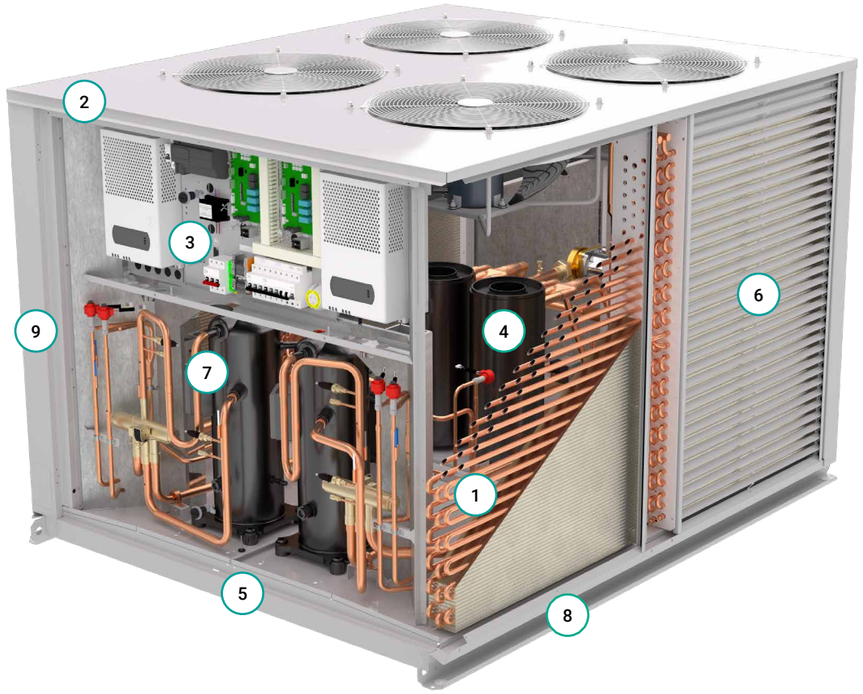
5
SKT coated screws provide a higher corrosion resistance than 316 stainless steel

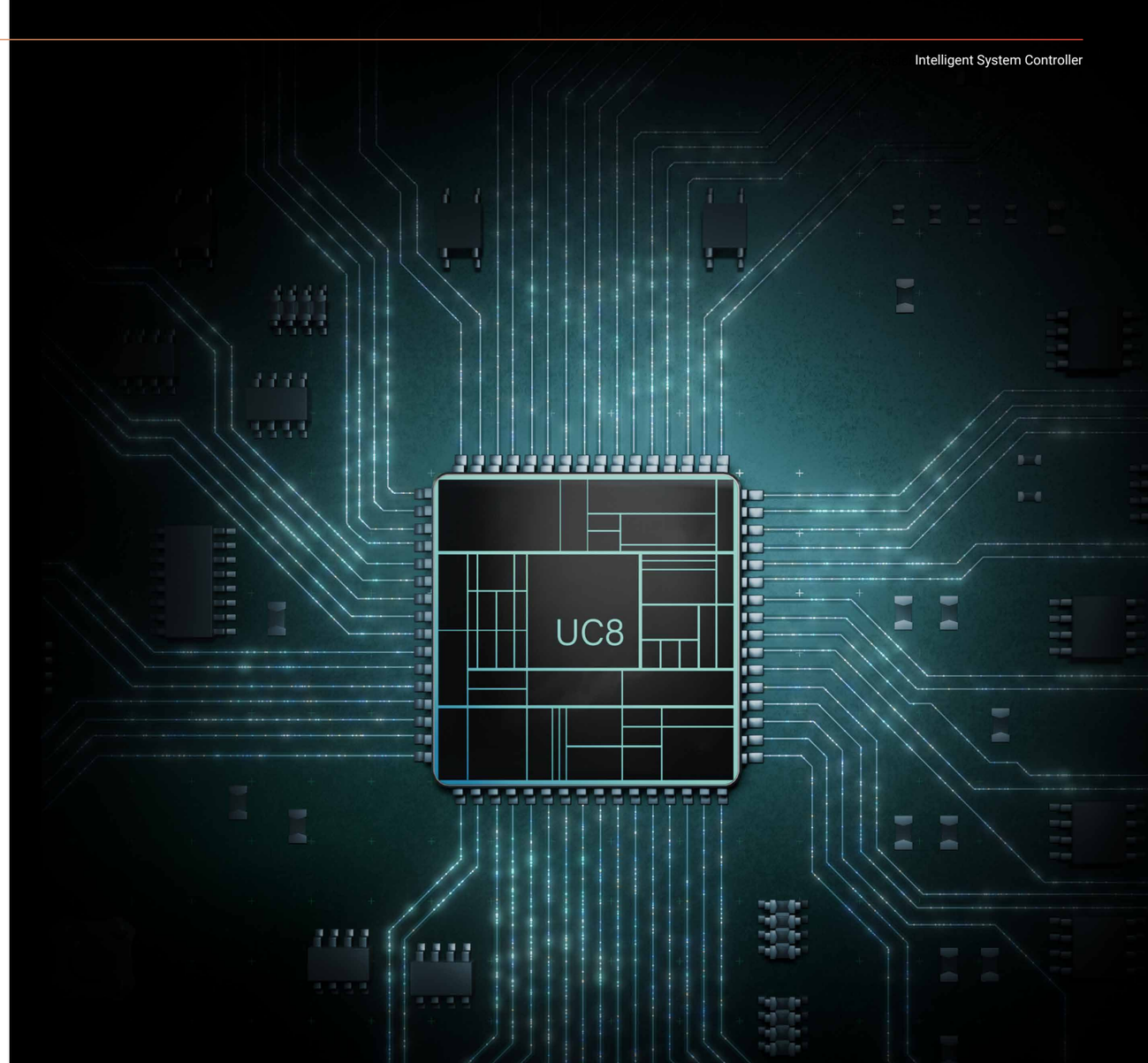
6
Commercially constructed compact system design. Louvre guards for added coil protection

7
Inverter compressor in-line technology for optimal efficiency and heating service

8
Draining base preventing water and ice accumulation inside the unit

9
Easy service and maintenance access using panels and leak-free doors





Intelligent System Controller

Temperzone's proprietary electronic controller intelligently monitors the refrigerant conditions, ambient and returning water temperature to deliver precise leaving water temperature while optimising system efficiency. A unique duplex electronic expansion valve control system ensures reliability and performance under a wide range of ambient temperatures (down to -10°C), while pressure transducers allow for precision pressure monitoring and control.

WiFi Service Utility Tool

WiFi Service Utility (WSU) is a portable control interface that plugs directly into the UC8 board on a Temperzone Air Conditioning Unit. It allows you to monitor a wide range of operational parameters, view fault logs and even take control of the unit. It has its own WiFi network built in and the control and diagnostics are done wirelessly from a smartphone, tablet or notebook PC.

MWH Water Heating Specifications

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Model	MWH 900 (no EVI)	MWH 900 (with EVI)	MWH 2000 (no EVI)	MWH 2000 (with EVI)
Heating Capacity (kW)				
Nominal Heating Capacity (net) [1]	77.5	89.3	140	154.3
Heating Capacity Range [2]	22.3 ~ 91.9	21 ~ 105	14 ~ 201	14 ~ 220
COP				
COP Heating [1]	3.35	3.14	3.09	3.33
Power				
Power Supply [4]	3 phase 400 V a.c. 50 Hz + N + E			
Input Power (kW) [1]	23.1	23.1	45.2	46.5
Running Current (A/sys)	16 / 18 / 16	16 / 18 / 16	103 A/ph	103 A/ph
Max. Running Current (A/sys)	30 / 33 / 30	30 / 33 / 30	121 A/ph	121 A/ph
Compressor				
Type	Inverter Scroll (x2)		Inverter Scroll (x4)	
Refrigerant	R32			
Technology				
Heat Exchanger	ThermoShell (x2)		ThermoShell (x4)	
Fans	3 speed Axial 500mm (x4)		EC Axial 800mm (x2)	
Pump Type Required	Integrated, BLDC (available option)		External, BLDC	
Max Head Delivery of Pump (m)	12		-	

Model	MWH 900 (no EVI)	MWH 900 (with EVI)	MWH 2000 (no EVI)	MWH 2000 (with EVI)
Noise Data (dBA)				
SPL @ 3 Metres	62		69	
Water Flow				
Nominal Water Flow Rate l/min.[1]	88	100	200	217
Entering Pressure Drop (kPa) [3]	45	50	16	21
Temperature Metrics (°C)				
LWT Range	25 ~ 55			
Min./Max. EWT	20 / 50			
Design Water Temp (EWT/LWT)	30 / 45			
Design HEX Differential	15			
Min. Ambient Operating Temp.	-10			
Communication				
Unit Controller	UC8 (x2)		UC8 (x4)	
Program Logic Controller	Schneider M172			
Communication Options	BMS / Modbus / BACnet			
Overall Dimensions & Weight				
W x D x H (mm)	1863 x 1477 x 1259		2842 x 2032 x 2114	
Net Weight (kg)	617	617	1533	1546

[1] Rating conditions: 7/6°C db/wb outdoor ambient; EWT 30°C; LWT 45°C.
[2] Ranges at rating conditions: Min. speed [1 comp.] ~ max. 100% [2 comp.]
[3] Pressure drop at Water Flow rate and rating conditions above
[4] Voltage range: 380–440 V
The manufacturer reserves the right to make changes in specifications at any time without notice or obligation.

temperzone
climate innovations

temperzone.com

Australia
ausales@temperzone.com

New Zealand
nzsales@temperzone.com

Singapore
sales@temperzone.com.sg

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