



**MAGNUS**<sup>®</sup>  
powerhouse water heaters

HEAT PUMP WATER HEATER

# Underfloor Heat Pumps



**temperzone**  
climate innovations



In-Line Design,  
A Revolutionary In  
Heat Pump Water  
Heater Application

Heating Capacity  
16.1kW - 37.5kW

 **ThermoShell**<sup>®</sup>  
technology

 **Inverter In-line**  
system



# Innovative Heat Pump Water Heater Solutions

Temperzone is dedicated to pioneering innovative new technologies and creating market-leading, easy-to-use solutions that offer precision climate control.

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



## Over 65 Years of Industry Experience

With over 65 years of expertise in the design of leading climate innovations, trust temperzone to offer the most efficient and reliable solutions for local conditions.

## Cost Effective Design

MAGNUS 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

MAGNUS 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 MWU heat pump water heater reduces energy input and increases in efficiency.

## Reliable Operation

MAGNUS 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.

# Features

**MAGNUS**<sup>®</sup>  
powerhouse water heaters



**In-line Design**

Directly delivers water at the required temperature removing the requirement for a water storage tank



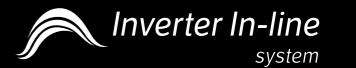
**ThermoShell<sup>®</sup>**

ThermoShell<sup>®</sup> heat exchanger non-fouling design for long life performance



**Inverter Compressors**

For superior part load performance and increased efficiency



**Electronic Expansion Valve**

Electronic expansion valves for greater control and efficiency



**Multi-speed Fans**

Multi speed condenser fans for better efficiency and control



**Low Ambient Temperature Operation**

Operates down to -10°C ambient temperature



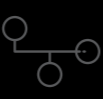
**Marine Grade Powder Coating**

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



**Local or 3rd Party Control**

Operates with Temperzone local or 3rd party controllers



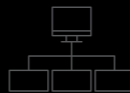
**Durable Compact Design**

Robust high quality commercial construction.



**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



# Heat Pump Water Heater Efficiency

A heat pump water heater is the most efficient form of heating as it is able to turn one unit of input power into four units of output power making it 400% efficient under typical operating conditions. Gas is typically only 70-80% efficient while electricity is only 100% efficient, so even though the initial cost may be higher for a heat pump system the very low cost of operation means the system is the most cost effective option.



Comparative energy input and output for various heating technologies\*



\* conditions: 7/6°C db/wb outdoor ambient; EWT 25°C; LWT 35°C

# Lowest Carbon Emissions

## MAGNUS Underfloor Heat Pumps

Utilising heat pump water heater technology leads to substantially reduced carbon emissions when compared to conventional water heating systems. Using renewable energy, individual units have nearly no carbon emissions and have the lowest overall carbon footprint. Carbon emissions can be reduced by as much as 70% when compared to gas boiler heating systems.

## Intelligent De-ice Performance

In very cold ambient conditions ice will form on the evaporator coil during operation. Our coil design has been optimised for the local humid marine climate to more effectively remove ice build-up while maintaining unit efficiency. Combined with our intelligent de-ice system, these are the most effective cold climate heat-pump water heating units on the market.

## Operates Down to -10°C Ambient

Designed for the harshest conditions, MAGNUS Underfloor heat pumps feature electronic expansion valves (EEV) which enable these units to operate in ambient temperatures down to -10°C and ensure efficient heating, whatever the weather.



# Innovative In-line Design Systems

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

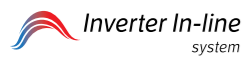
## MAGNUS In-line Advantage

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.

Temperzone In-line systems directly provide the capacity required for the underfloor heating eliminating the need for water storage 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.

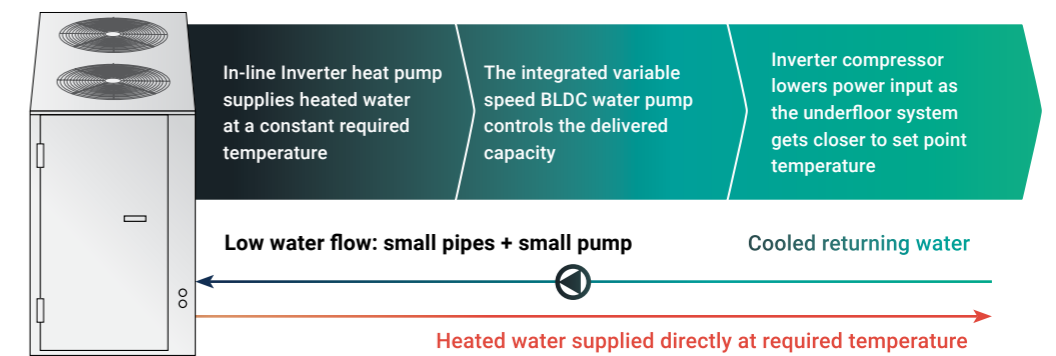
## Main Benefits of MAGNUS In-line Systems



- Reduction in piping diameter required
- Reduction in required pump power
- Reliable long life system design
- Most energy efficient system
- Compact system design
- Low service / maintenance

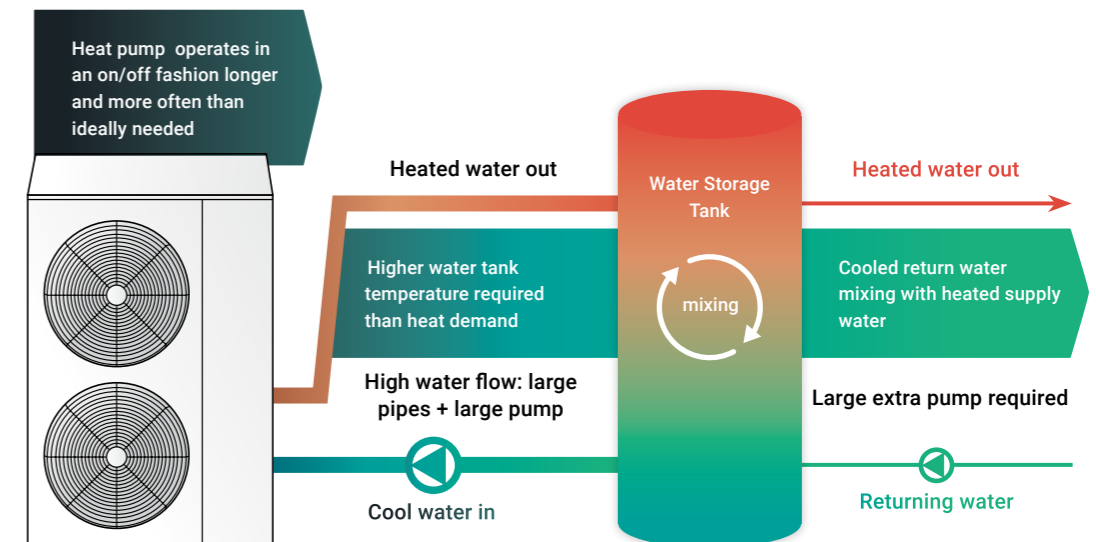
## Efficient Temperzone In-line System

MAGNUS In-line systems are designed to directly provide water at the right temperature required by the underfloor system; conventional heat pumps are not able to do this. Unlike conventional underfloor heat pumps, MAGNUS In-line underfloor heat pumps are specifically designed for underfloor heating to maximise efficiency and cost effectiveness.



## Inefficient Conventional Systems

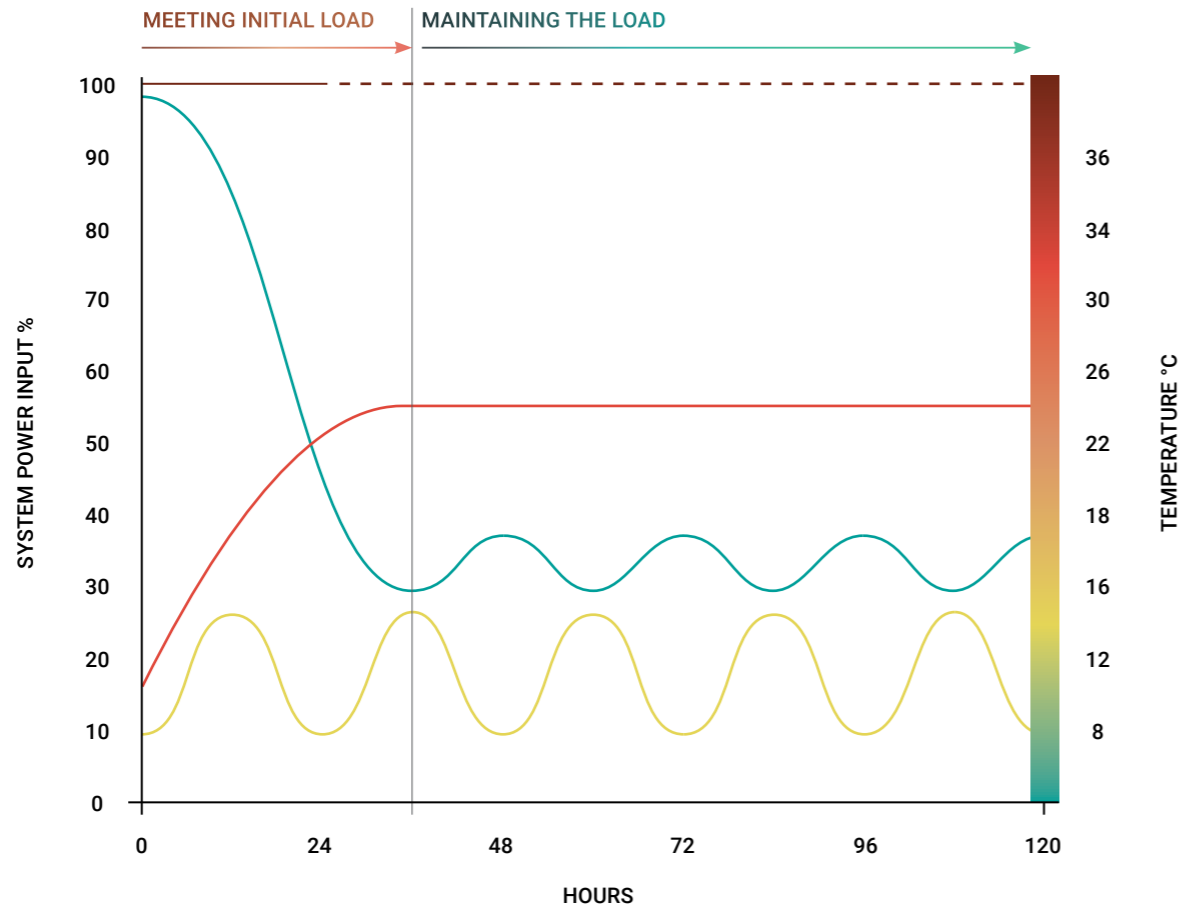
Conventional underfloor heat pump system design is inefficient. Situated between the heat pump and underfloor network is a water storage tank or secondary heat exchanger which must be heated so water can be supplied to the underfloor tubing. Because returning cooled water mixes with the heated water the tank must be heated to a higher temperature than the underfloor requires. This continual mixing and the need for a higher water tank temperature makes the system inefficient as the heat pump must operate for longer and at a higher power input than ideally required.



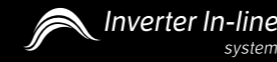
# Superior Efficiency

Achieving energy savings over conventional buffer tank systems, the MAGNUS In-line system fully utilises its inverter compressor technology by reducing its power input as the floor warms up to the set temperature. Conventional fixed speed (and inverter) buffer tank systems are less efficient as they must operate longer and with higher energy input than ideally required.

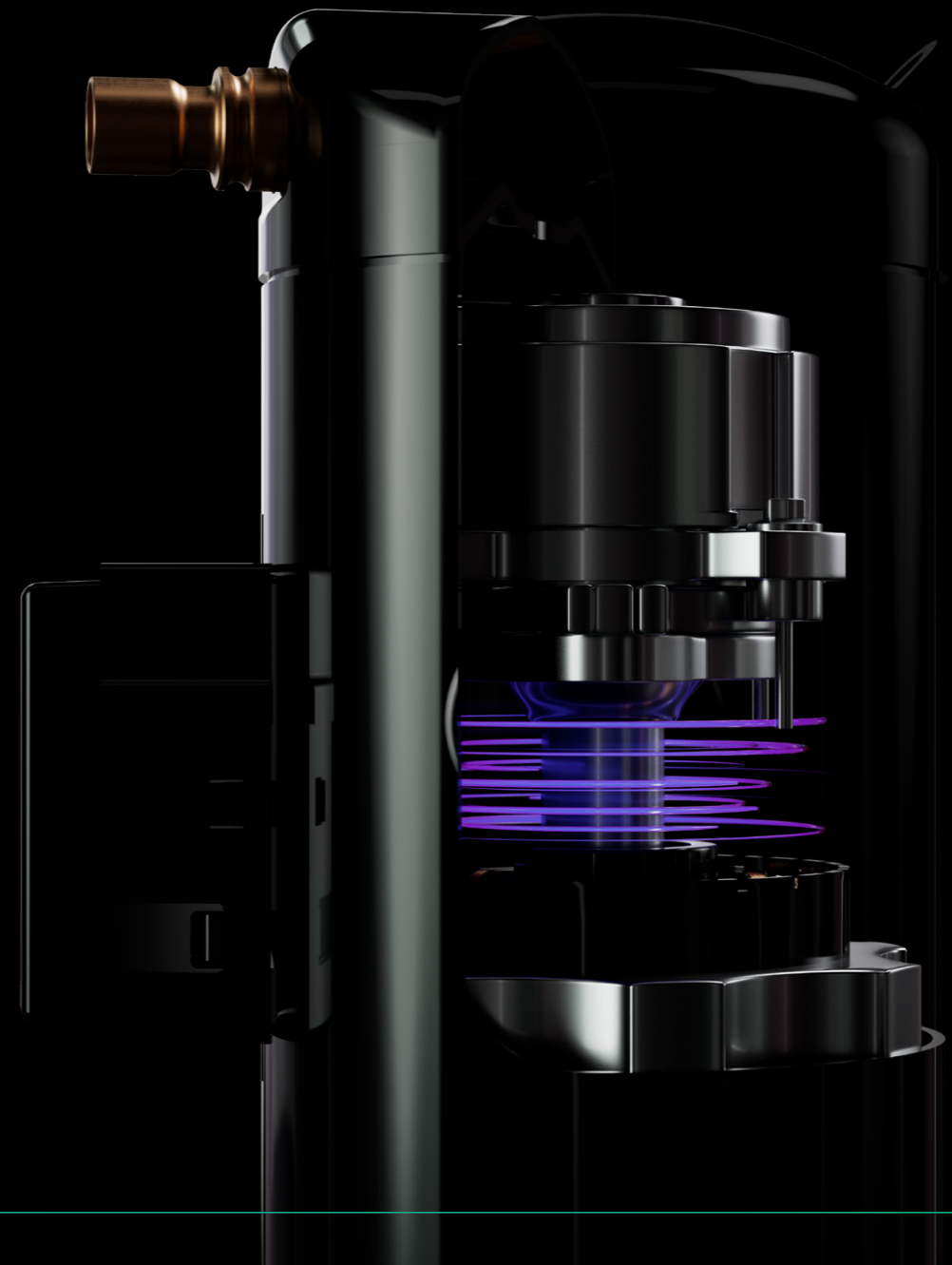
- System Power Input Comparison
- Conventional on/off system input power
  - MAGNUS In-line system input power
  - Indoor Temperature (set 24°C)
  - Ambient Temperature



## Variable Capacity Inverter Compressor



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.

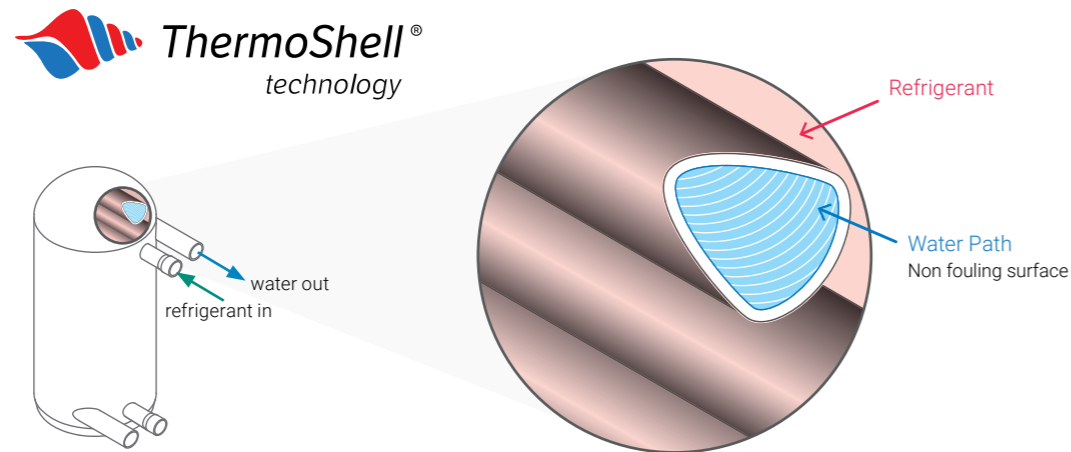


# Non Fouling ThermoShell® Technology

The Temperzone MWU Series applies the most appropriate technology for the application, and integrates advanced control logic to maximise 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 MAGNUS 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.



ThermoShell® Heat Exchanger

## BLDC Variable Speed Pumps

MAGNUS In-line underfloor systems only require a single small highly efficient variable speed pump which is integrated into the unit. These Class A pumps feature an EC motor which reduces energy use by around 50%. Conventional systems have high water flow rates so require two large costly pumps to run the system.

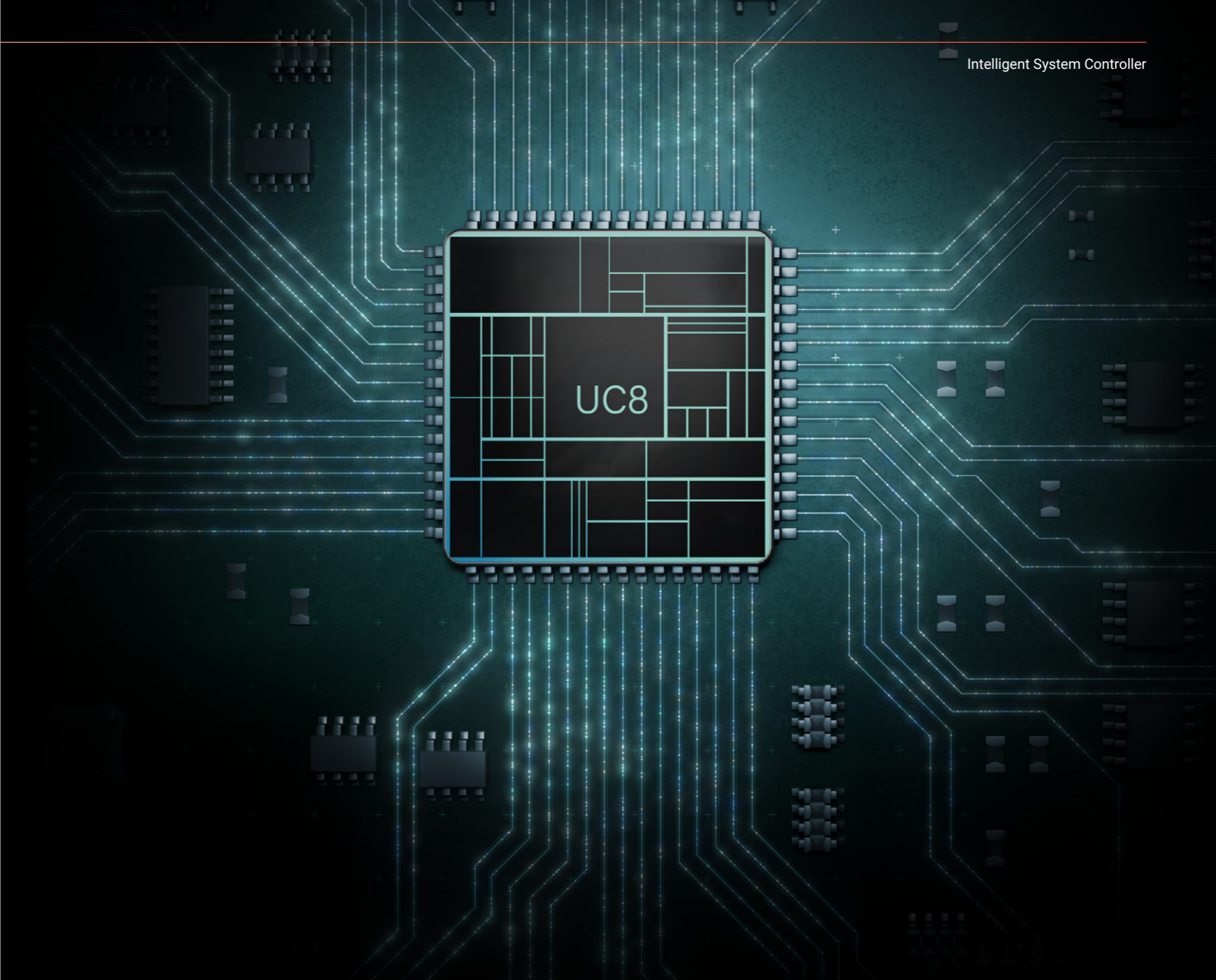
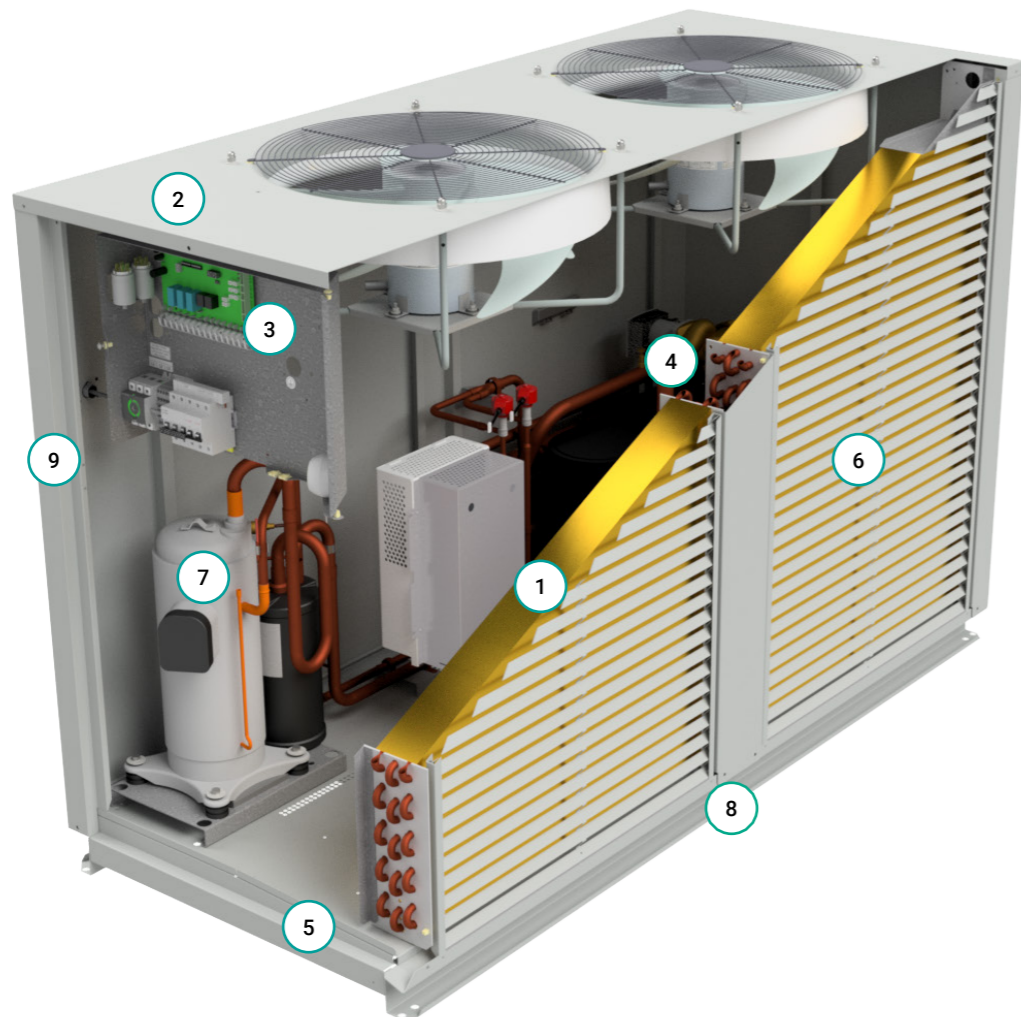
Ideal solution for aged care facilities





# 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, 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.

### BMS Control Integration

Providing for centralised management control, the UC8 controller is BMS compatible via digital and analogue signals or via Modbus.

### Local or 3rd Party Control

Choose either Temperzone's TZT-100 advanced thermostat controller, or utilise 3rd-party control integration with 12VAC or 24VDC control.

# MWU Water Heating Specifications



Model	MWU 180	MWU 250	MWU 450
<b>Heating Performance</b>			
Nominal Heating Capacity (kW)*	16.1	20.4	37.5
Heating Capacity Range (kW)	3.7 ~ 20.0	4.6 ~ 25.5	8.5 ~ 46.5
Input Power (KW)*	3.9	5.0	9.3
COP Heating*	4.11	4.08	4.04
Water Flow Rate (l/min.)	23	29	54
<b>Components</b>			
Heat Exchanger	ThermoShell		ThermoShell x3
Fans	3 spd Axial 500mm		3 spd Axial 500mm (x2)
Electronic Expansion Valves	1		2
Pump	Integrated BLDC		
Water Connections	1" BSP male (x2)		1 1/4" BSP male (x2)
<b>Power</b>			
Power Source	1ph. 230V ac 50Hz	3ph. 400V ac 50Hz	
Running Amps - Total sys. (A/ph.)	18	8.5 / 9.5 / 8.5	16 / 18 / 16
Max Running Amps - Total sys. (A/ph.)	29	16 / 18 / 16	30 / 33 / 30
<b>Compressor</b>			
Type	Inverter Scroll		
Refrigerant	R410A		

Model	MWU 180	MWU 250	MWU 450
<b>Sound Data</b>			
Sound Power (SWL) dB(A)**	72	73	75
Sound Pressure @ 3m (SPL) dB(A)	56	57	59
<b>Design Specifications</b>			
Min./Max. EWT °C (Heating)	10 / 35		
Design HEX Differential °C	10		
Entering Pressure Drop * kPa	34 (5 psi)	55 (8 psi)	21 (3 psi)
Min. Ambient Operating Temp.	-10°C		
LWT Range °C	25 ~ 45 (factory setting 35)		
<b>Communication</b>			
Unit Controller	UC8		
Communication Options	TZT-100 (controller included) / Modbus (BACNET option) / 3rd Party controls		
<b>Overall Dimensions, Weight &amp; Finish</b>			
W x D x H (mm)	978 x 804 x 1199		1814 x 803 x 1199
Net Weight (kg)	169	178	322
Unit Finish	Zinc galvanised steel / grey polyester powder coat		

\* Rating conditions: 7/6°C db/wb outdoor ambient; EWT 25°C; LWT 35°C.

\*\*Radiated. BS 848.2 : 2004. Direct method of measurement (reverberant room).

The manufacturer reserves the right to make changes in specifications at any time without notice or obligation.



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