



# Aqualean Horizontal Water Cooled Packaged Air Conditioner

More thermal comfort with less  
energy consumption



Exclusively distributed by



# Aqualean Water Cooled Packaged Unit



## Introduction & Overview

AQUALEAN is a water sourced heat pump packaged unit, designed to provide high efficiency air conditioning and ventilation for hotels/motels, open-plan, cellular offices and other similar commercial applications. Each unit responds to the specific heating or cooling load of the individual assigned zones.

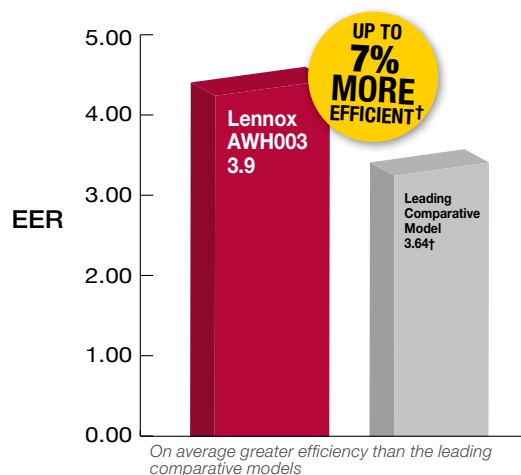
Additionally, it ensures an excellent comfort level for occupants, better control of energy consumption and lower seasonal operating costs. It is generally connected to a closed water loop (boiler/cooling tower or geothermal application) or to an open ground water loop.

## Market Segments

- Retail
- Business Parks / Offices
- Hotels / Lodging / Accommodation
- Multi-residential / Aged care
- Civic
- Light commercial

## Key Features

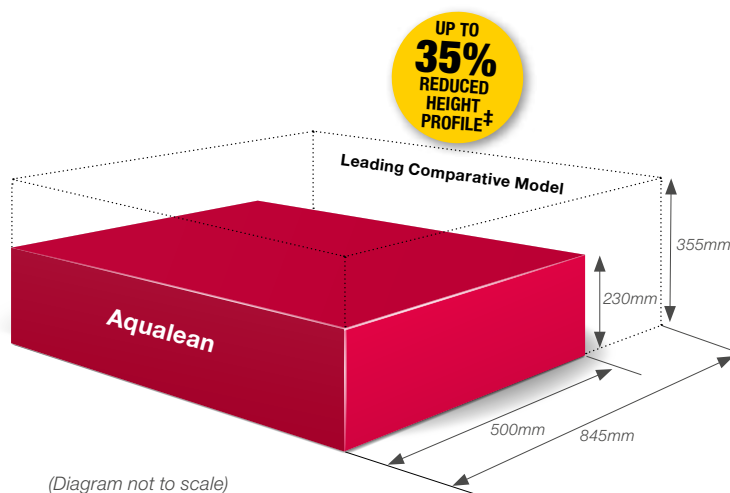
- High efficiency system
- Compact solution and reduced height
- Specially dimensioned for ceiling installation
- Quiet operation
- Low energy consumption
- Wide choice of communication interfaces



### Energy Efficiency

The Lennox Aqualean range is on average more energy efficient than market leading comparative models. For the 3kW unit, the difference is 7%†. This is due to main component attributes including; Climatic™ DDC controller, rotary/scroll compressors, EC/AC centrifugal fans, coaxial/plate heat exchanger, electronic expansion valves, pressure transducers and temperature sensors standard across the range.

† 7% more efficient is based on a comparison of the cooling efficiencies of the leading comparative model and Lennox AWH003. Average based on the cooling efficiencies of leading comparative models and Lennox Aqualean models. Source: Comparative brand literature, April, 2017



### Floor Height Optimisation

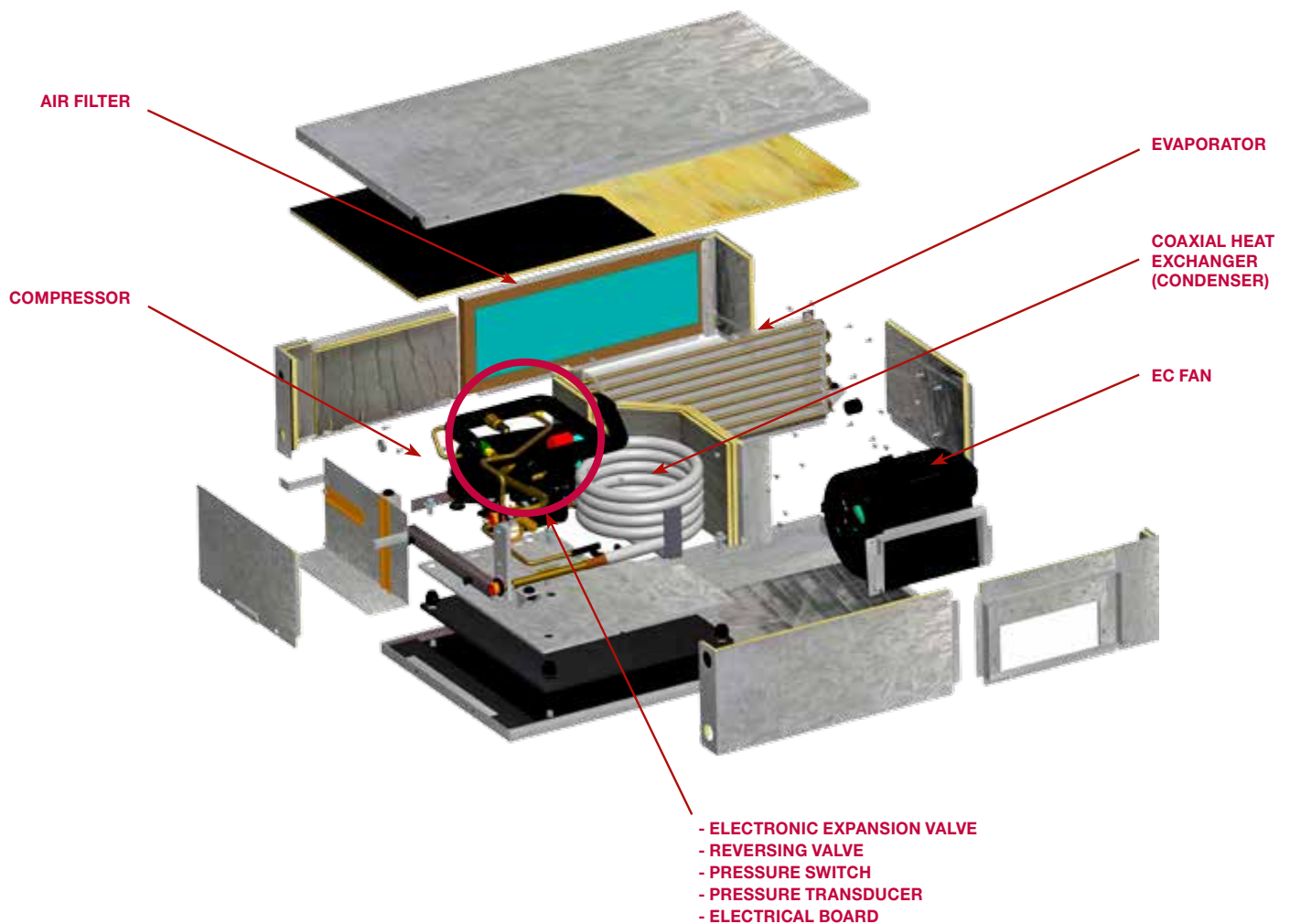
The 2kW and 3kW units are the lowest height profile in the market at just 230mm. Since a building's air conditioning equipment typically occupies the ceiling space, the Aqualean has the potential to save 125mm in each floor ceiling. This saving can reduce the slab to slab height in a high rise building so that an additional floor can be added to a 22 story building (with a slab to slab height of 2.8m) without increasing the overall building height.

‡ 35% reduced height profile when comparing the Lennox Aqualean AWH003 with the leading comparative model. Source: Comparative brand literature, April, 2017

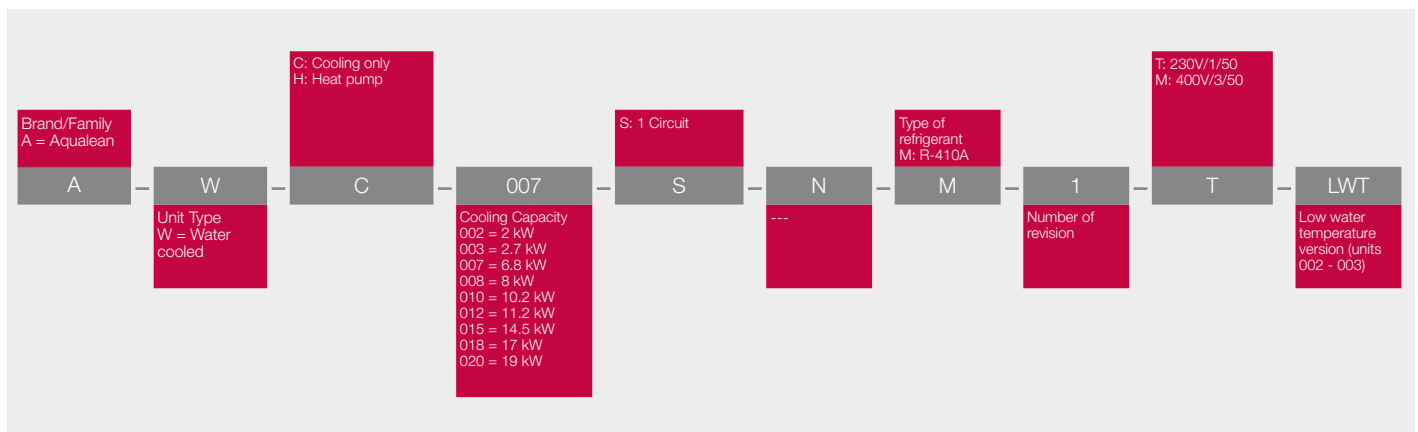
## Features & Benefits

The Aqualean water sourced heat pump is one of the most efficient, environmentally friendly systems available for cooling and heating. Key features include:

- High efficiency system thanks to scroll/rotary compressor operating with R410A
- Compact self-supporting casing with very short height to lower dropped ceiling dimensions
- Auto adjust 3 speed supply fans
- Washable polypropylene air filter
- Lennox's advanced Climatic controller is designed to improve energy efficiency and reliability. Accurate operation is managed by electronic expansion valves, pressure transducers and temperature sensors. This controller integrates master/slave capability and a wide choice of communication protocol for BMS HLI.




## Nomenclature



# Aqualean Water Cooled Packaged Unit



## Control Options

DC60 Comfort Display	DM60 Multiple Display	DS60 Service Display
Standard for 007-020 Optional for 002-003	Optional	Optional
up to 30m	Distance 1000m up to 8 units	up to 30m
ON/OFF unit Control operating mode Fan speed management Temperature setting Time setting  View: Number of units Alarm code Ambient temperature Supply temperature	Basic functionalities Time schedule setting	Full accessibility Professional mode
		

## BMS Communication Options

The control board is equipped with a RS485 serial communication port to allow remote management through communication bus. According to the desired communication protocol, the Aqualean control board can be fitted with ModBus®, LonWorks® or BacNET® communication interface.

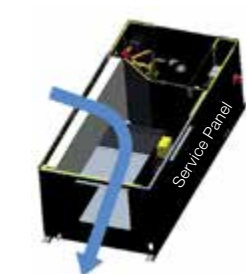
## Airflow Configuration

Units are assembled with supply airflow configuration on the side (90° angle to the return).

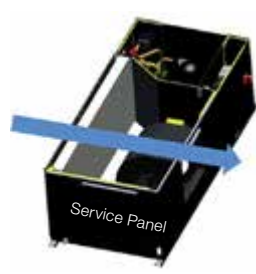
On site, the fan can easily be repositioned for an in-line supply.

For models AWC/H 018-020 the additional sheet metal parts and fan support are not needed and can be removed.

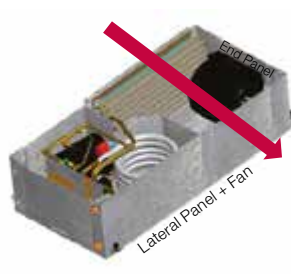
See picture below for airflow configurations.



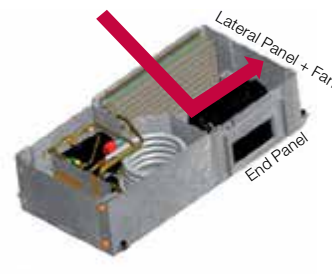
Standard (Units 007 to 020)



On Site (Units 007 to 020)



Standard (Units 002 to 003)



On Site (Units 002 to 003)

## Components

### Cabinet

The cabinet is made of unpainted galvanised steel. Thanks to its compact dimensions, and its technical features, the unit can be positioned in almost any location. Thermal-acoustic insulation in the compressor area reduces noise levels.

**Units 002-003:** - 10 mm (M1) insulation in air section.

**Units 007-020:** - 25 mm A2, S1, D0 (M0) in the air treatment section.

### Air Exchanger

Made of copper tubing with aluminium swirl fins, the air exchanger is designed and specially dimensioned to obtain the maximum output.

### Compressor

**Units 002-003:** - Rotary compressor

**Units 007-020:** - Scroll compressor

Each type of compressor includes internal thermic protection. The compressor is mounted on vibration-absorbent blocks both on the inside and outside, statically and dynamically balanced.

### Fan

**Units 002-003:** - EC fan motor

**Units 007-020:** - Centrifugal fan motor in units 007 to 020 with 3 fan speeds.

An automatic mode allows the fan to automatically adapt the airflow rate to demand to generate energy savings (airflow variation between min/nominal/max airflow).

### Water Exchanger

**Units 002-003:** - Coaxial exchanger

**Units 007-020:** - Plate heat exchanger, compact and resistant, made of brazed stainless steel plates and specially selected and designed for this type of unit.

### Cooling/Heating Circuit

Manufactured with welded dehumidified copper tubes.

#### Cooling only units (AWC):

Includes a dehydrator filter, a liquid receiver, an electronic expansion valve, as well as a high pressure switch and low pressure transducer.

#### Heat pump units (AWH):

Includes a 4-way valve, and a liquid receiver in the sizes 007 to 020.

**The unit is factory charged with R410A refrigerant (unless otherwise ordered).**

### Water Circuit

Aqualean includes water threaded connections.

### Air Filter

Washable polypropylene air filter. Filter installed on a rail for easy maintenance.

### Electric Circuit

The electrical box includes all the components and the main terminal blocks. The unit includes a printed board and a reversible working mode for the heat pump units. It also includes alarms, distance control and 230V 1 Amps connection for a circulation water pump.

### Remote Control

The unit is delivered with a customer display offering the following functionalities:

- On/Off
- Operating mode selection (Cooling/Heating/Auto)
- Room temperature set point setting
- Airflow rate setting (Mini/Nominal/Max/Auto)
- Supervision of units connected in Master/Slave (up to 10 units) A DS60 controller is required to enable this function
- Time setting
- Ambience temperature reading
- Alarm codes reading

### Options

#### Units 002 to 020:

- ModBus/BACnet/LonWorks Interface
- DM60 display for scheduling/zoning settings
- DS60 service display



#### Units 007 to 020:

- Electrical heater mounted on fan discharge
- Paddle flow switch
- Water filter
- Main disconnect switch
- 3 Phase protection
- Compressor acoustic insulation
- Low water loop temperature
- Water differential pressure switch

# Aqualean Water Cooled Packaged Unit



## Technical Data Summary

		Super Low Profile		Standard Profile						
										
UNIT MODEL		AWH002	AWH003	AWC007 AWH007	AWC008 AWH008	AWC010 AWH010	AWC012 AWH012	AWC015 AWH015	AWC018 AWH018	AWC020 AWH020
TOTAL COOLING CAPACITY	COOLING kW	2.0	2.7	6.8	8.0	10.2	11.2	14.5	17.0	19.0
	HEATING kW	2.6	3.5	8.0	9.5	12.2	13.4	16.9	19.4	21.8
INPUT POWER	COOLING kW	0.5	0.7	1.6	2.1	2.5	3.1	3.7	4.3	4.7
	HEATING kW	0.6	0.8	2.1	2.5	3.1	3.7	4.5	5.0	6.0
EER	COOLING	4.3	3.9	4.3	3.9	4.1	3.6	4.0	4.0	4.0
COP	HEATING	4.4	4.3	3.8	3.8	4.0	3.7	3.7	3.9	3.6
AIR EXCHANGER	TYPE	Copper tubes with aluminium swirl fins								
WATER EXCHANGER	TYPE	Coaxial exchanger		Plate heat exchanger						
COMPRESSOR	TYPE	Tecumseh Rotary		Copeland Scroll						
POWER SUPPLY	V / Ø / Hz	230V / 1 / 50						-	-	-
		-	-	-	-	-	400V / 3 / 50			
MAXIMUM RUNNING CURRENT	A	3.6	4.9	14.4	17.6	24.6	28.6/10.6	12.9	14.7	17.9
STARTING CURRENT (DOL)	A	15.3	17.3	61.6	68.6	100.6	130.6/45.6	54.1	66.9	77.9
AIRFLOW	MAXIMUM (L/S)	135	153	397	450	583	611	725	861	972
	NOMINAL (L/S)	122	143	347	417	528	556	681	778	861
	MINIMUM (L/S)	79	93	281	347	431	450	514	572	681
WATER FLOW	MAXIMUM (L/S)	0.19	0.22	0.58	0.69	0.87	0.96	1.22	1.44	1.62
	NOMINAL (L/S)	0.14	0.16	0.40	0.48	0.61	0.67	0.85	1.01	1.14
	MINIMUM (L/S)	0.10	0.11	0.28	0.34	0.43	0.47	0.60	0.71	0.79
MAXIMUM STATIC PRESSURE	Pa	90	100	150	125	150	150	150	150	150
NOMINAL WATER PRESSURE DROP	kPa	20	24	25	30	40	48	40	45	55
DIMENSIONS	HEIGHT (mm)	230	230	441	441	491	491	491	531	531
	WIDTH (mm)	1000	1000	886	886	1180	1180	1180	1600	1600
	DEPTH (mm)	500	500	492	492	623	623	623	703	703
NET WEIGHT	AWC (kg)	-	-	69	70	109	111	113	148	148
	AWH (kg)	53	56	71	72	111	113	116	151	151
SOUND PRESSURE LEVEL <sup>3</sup>	LOW/HIGH SPEED (dBA)	41/43	43/46	49/51	50/52	48/51	49/51	49/53	46/51	47/54
SOUND POWER LEVEL	LOW/HIGH SPEED (dBA)	46/48	52/54	62/64	66/69	65/68	67/70	69/72	66/70	69/73

1. Total cooling capacity at AS/NZS 3823.1.3 rating conditions:  
Exchanger air inlet temperature: 27°C DB, 19°C WB  
Exchanger water inlet temperature: 30°C

2. Total heating capacity at AS/NZS 3823.1.3 rating conditions:  
Exchanger air inlet temperature: 20°C DB  
Exchanger water inlet temperature: 20°C

3. Sound Pressure Level measured at a distance of 2m from the unit, with duct in aspiration and air discharge, normal absorption in accordance with room size and unit capacity

4. Water operating range: Cooling 16°C to 45°C,  
Heating 10°C to 25°C (Standard version)  
Cooling 0°C to 45°C, Heating 10°C to 25°C (LWT for 007-020 models)  
Cooling 0°C to 45°C, Heating 0°C to 25°C (LWT for 002-003)

\*Operation with water outlet temperature below 5°C requires antifreeze solution

## Field Information

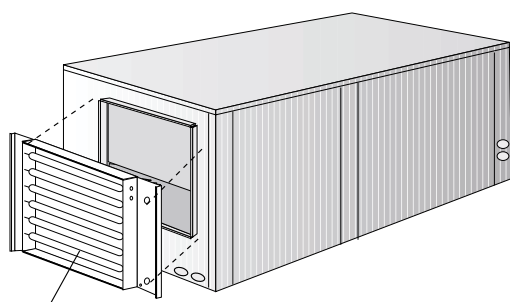
UNIT MODEL		AWH002	AWH003	AWH007 AWC007	AWH008 AWC008	AWH010 AWC010	AWH012 AWC012	AWH015 AWC015	AWH018 AWC018	AWH020 AWC020
REFRIGERANT (R410A)	FACTORY CHARGE (kg)	0.6	0.65	1.3	1.3	1.85	1.95	2.4	2.9	2.9
HYDRAULIC CONNECTIONS	SIZE/TYPE	1/2" G	1/2" G	1" G	1" G	1" G	1" G	1" G	1" G	1" G
AIR DUCT SPIGOT (STD)	SUPPLY H x W (mm)	142 X 300	142 X 300	215 X 240	215 X 240	295 X 271	295 X 271	295 X 271	295 X 339	295 X 339

## Optional Accessories

UNIT MODEL		AWH002	AWH003	AWC007 AWH007	AWC008 AWH008	AWC010 AWH010	AWC012 AWH012	AWC015 AWH015	AWC018 AWH018	AWC020 AWH020
ELECTRIC HEATER OPTION	S/M/H (kW)	-	-	2/5/-	2/5/-	3/5/-	3/5/9	3/5/9	5/9/12	5/9/12
ELECTRONIC EXPANSION VALVE		•	•	•	•	•	•	•	•	•
EC FAN MOTOR		•	•	-	-	-	-	-	-	-
AIR FILTER		•	•	•	•	•	•	•	•	•
COMPRESSOR ACOUSTIC JACKET		-	-	◦	◦	◦	◦	◦	◦	◦
DC60 REMOTE CONTROL		◦	◦	•	•	•	•	•	•	•
DM60 DISPLAY FOR SCHEDULING AND ZONING		◦	◦	◦	◦	◦	◦	◦	◦	◦
DS60 SERVICE DISPLAY		◦	◦	◦	◦	◦	◦	◦	◦	◦
BMS COMPATIBILITY: MODBUS, BACNET, LONWORKS		◦	◦	◦	◦	◦	◦	◦	◦	◦
MAIN SWITCH		-	-	◦	◦	◦	◦	◦	◦	◦
THREE PHASE PROTECTION		-	-	-	-	-	◦	◦	◦	◦
WATER FILTER		-	-	◦	◦	◦	◦	◦	◦	◦
FLOW SWITCH		-	-	◦	◦	◦	◦	◦	◦	◦
WATER DIFFERENTIAL PRESSURE SWITCH		-	-	◦	◦	◦	◦	◦	◦	◦
LOW WATER TEMPERATURE		◦	◦	◦	◦	◦	◦	◦	◦	◦

- Standard
- Optional
- N/A

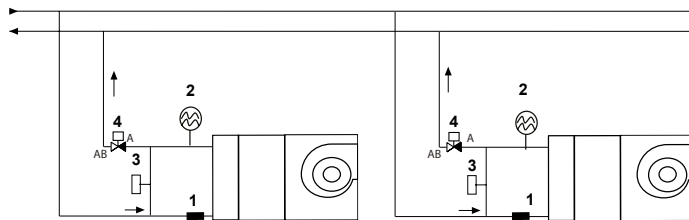
### Heating Options (Units 007 to 020)



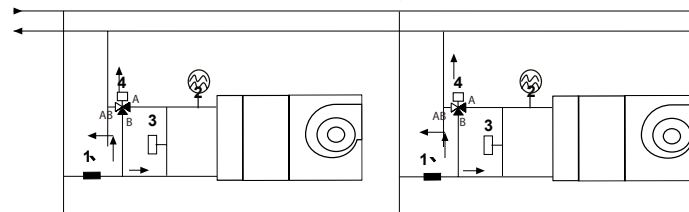
Electrical heater

### Hydraulic Options (Supplied loose)

#### UNITS INSTALLATION WITH TWO WAY VALVES (UNITS 007 TO 020)



#### UNITS INSTALLATION WITH THREE WAY VALVES (UNITS 007 TO 020 and 002-003 LWT version)



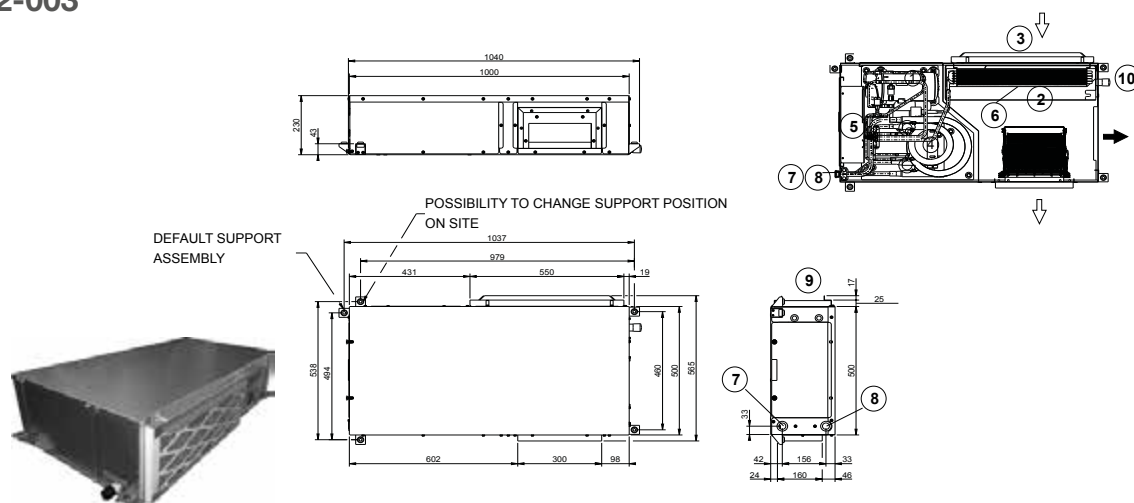
# Aqualean Water Cooled Packaged Unit



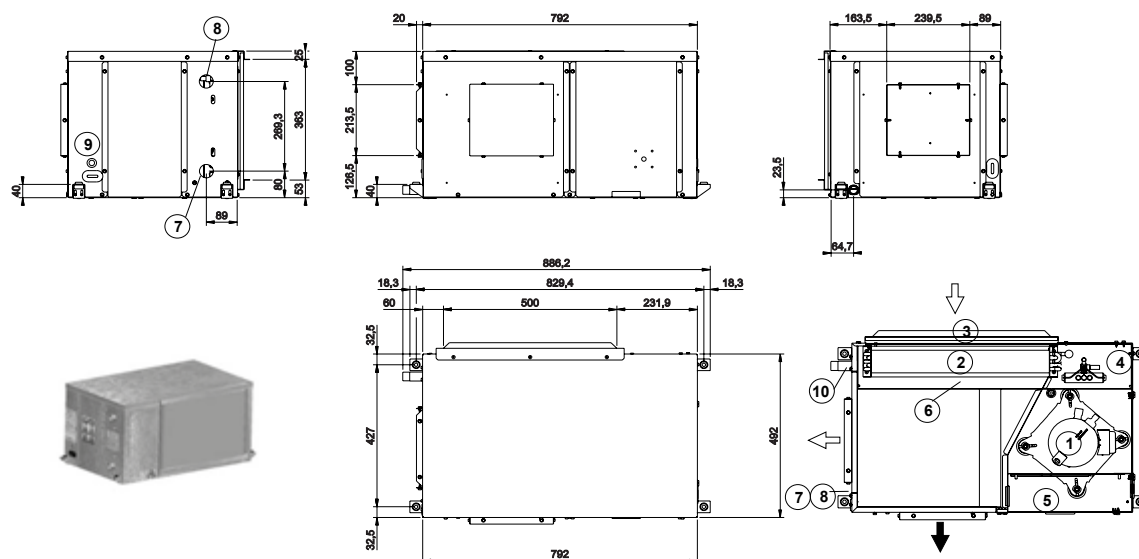
## Dimensions

①	Compressor	⑤	Electrical box	⑨	Power supply
②	Coil	⑥	Drip tray	⑩	Drainage
③	Air filter	⑦	Inlet water	➔	Air configuration standard
④	Water exchanger	⑧	Outlet water	➔	Air configuration option on site

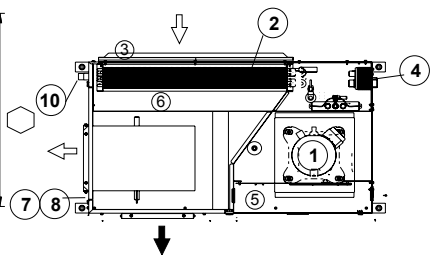
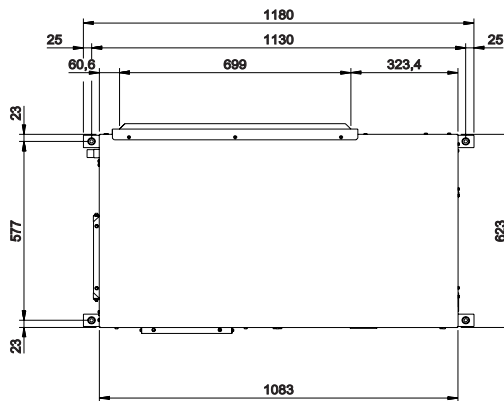
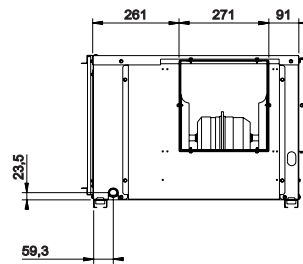
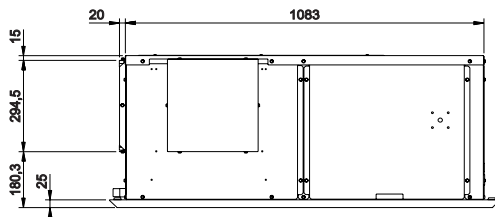
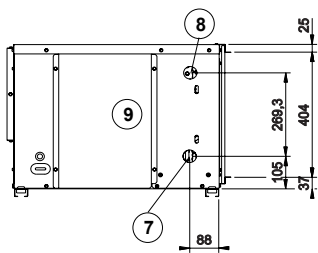
### AWH 002-003



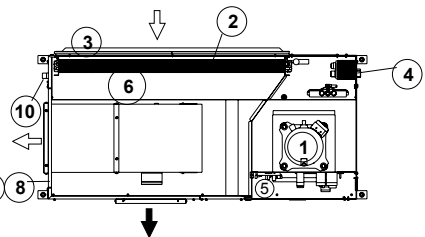
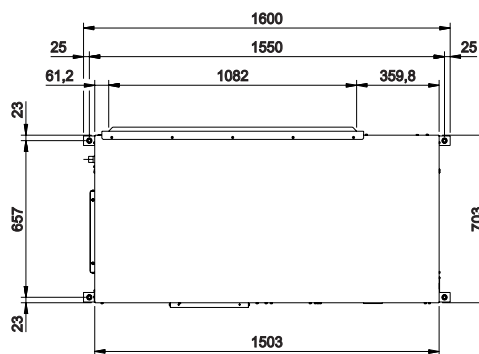
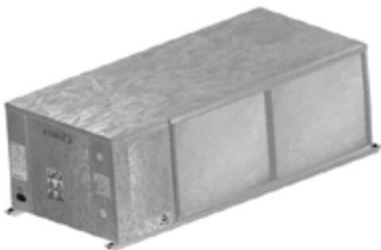
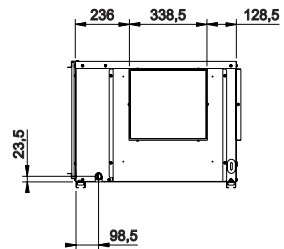
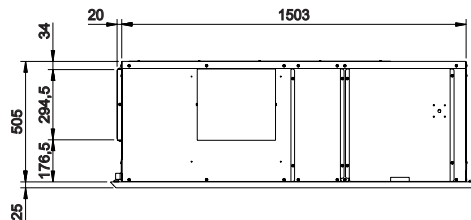
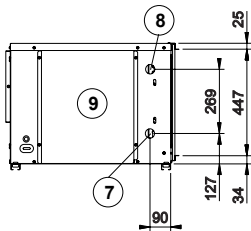
### AWC/AWH 007-008



**AWH/AWH 010-012-015**



**AWC/AWH 018-020**





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australia

**13 23 50**

lennoxaustralia.com.au

new zealand

**0800 653 330**

lennoxnz.co.nz

