

# COMMERCIAL HEAT PUMP



Heat water by using free energy from the air with our Air to Water models or by using waste heat from a chiller with our Water to Water models

## CASE STUDY

### AUSTRALIAN UNITY

PARRAMATTA, NSW

A modern office building comprising 14 levels of office space in Parramatta needed an end-of-trip facility.

#### Hot Water Requirements

With the project requirements calling for a high-efficiency hot water plant capable of accommodating 10 showers and a 2000 litre load over a two-hour peak, the Rheem Commercial team sized and proposed a ducted commercial air to water heat pump. Configured to vent cool discharge air into the car park entrance via a sheet metal duct, the system's flexibility was also a major advantage when it came to accommodating the limited space available for the hot water plant.

#### Solution

In order to provide hot water boost in situations where higher than expected peak loads or low overnight temperatures preclude heat pump hot water recovery, a 15kW heating element was installed in the top third of the 2000 litre Rheem Stainless Steel storage tank.



# RHEEM COMMERCIAL HEAT PUMP

As the largest supplier of commercial water heaters in Australasia, Rheem Commercial is now introducing two groups of heat pumps with two different technologies by collecting free heat energy from air and waste heat from the building chilling circuit.

Rheem can now boast an expanded, true commercial grade, high thermal efficiency, WaterMark certified heat pump range – in both air to water and water to water technologies.

These high efficiency models offer:

- Reduced running costs and CO<sub>2</sub> emissions for building owners
- High quality components for durability
- Suitability to most of New Zealand's climate
- Rheem iQ control provides on-board diagnostics, system configuration and optional BMS connectivity
- Two model sizes in each range that broaden your redundancy and shrink your plant footprint

Manufactured by Rheem in Australia, the Commercial Heat Pump range in New Zealand is supported by a nationwide service centre network along with New Zealand technical support.



# AIR TO WATER HEAT PUMP

FOR WHERE ENERGY EFFICIENCY IS ESSENTIAL



HOT WATER TO

65°C

SAVE UP TO 75% ENERGY

FLEXIBLE USES CAR PARK AIR



65°C hot water in a super-efficient, super-compact package.



## Highly efficient

Up to 25% of the operating cost of an electric water heater. Delivers hot water up to 65°C, with a system Coefficient of Performance (COP) of up to 4.0<sup>1</sup>. This makes it substantially cheaper to run than electric, natural gas or ULPG. Highly efficient option for fuel redundancy. Heat pumps can also be used as a preheat to other boost fuel types.

## Green points

Adds to the green points from end-of-trip facilities. The heat pump is designed to draw its air from and discharge within basement car parks without flueing, unlike gas systems.

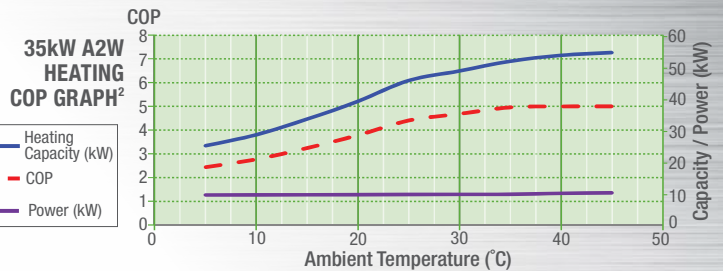
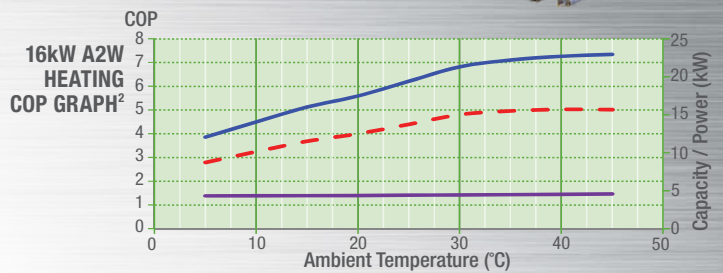
## Multiple installation options

Designed for both vertical or horizontal discharge options, with a discharge fan option available in both ducted and non-ducted versions. Horizontal discharge models can also be stacked two high to reduce plant footprint (suffix 'S').

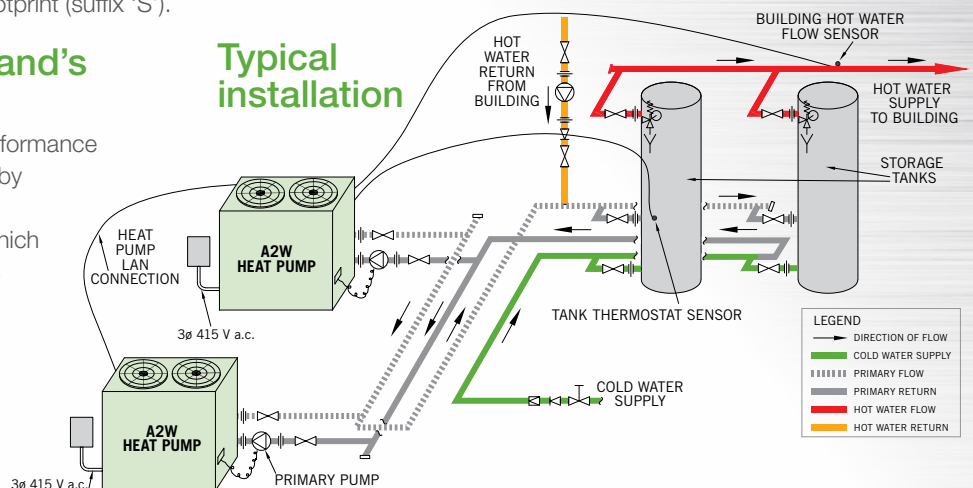
## Suits most of New Zealand's climate\*

Automatic defrost allows continued performance in low ambient temperature conditions by diverting a portion of the hot refrigerant to the evaporator coil to melt any ice which may form. In addition, the evaporator is dipped to provide extra protection in corrosive atmospheres, and the unit has been tested in ambient conditions as high as 40°C.

\*Enquire at Rheem NZ Ltd for very cold climates



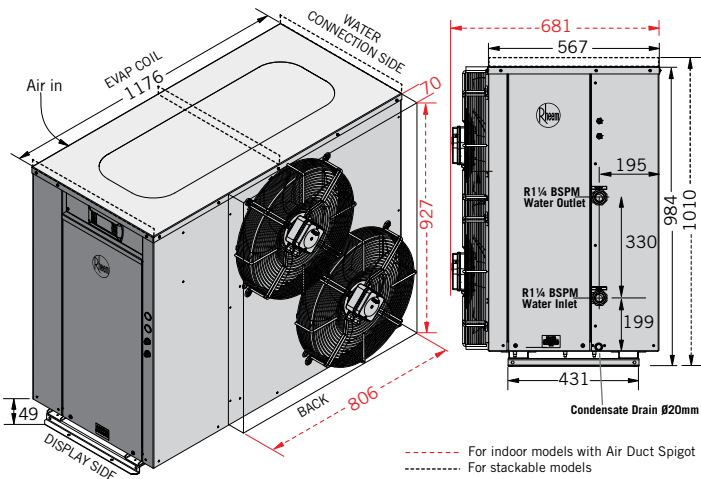
## Typical installation



# AIR TO WATER 16kW MODEL TECHNICAL DATA

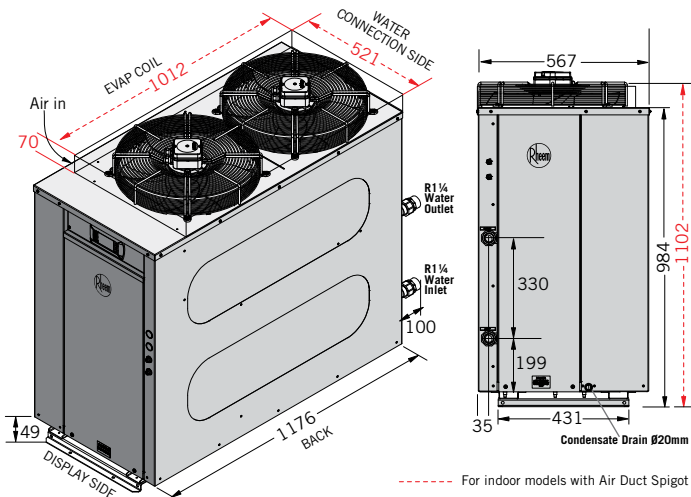
## 16kW AIR TO WATER – ALL HORIZONTAL DISCHARGE MODELS

953016H0 – Non Ducted    953016HS – Non Ducted stackable  
952016H0 – Ducted        952016HS – Ducted stackable



## 16kW AIR TO WATER – ALL VERTICAL DISCHARGE MODELS

95301600 – Non Ducted    95201600 – Ducted



### RECOVERY

| Ambient Temperature °C     | 5   | 10   | 15   | 20           | 25   | 30   | 35   | 40  |
|----------------------------|-----|------|------|--------------|------|------|------|-----|
| Output (kW)                | 12  | 14.5 | 16.4 | <b>17.46</b> | 19.5 | 21.7 | 22.5 | 23  |
| Recovery – Litres per hour |     |      |      |              |      |      |      |     |
| 20°C rise                  | 516 | 624  | 705  | 751          | 839  | 933  | 968  | 989 |
| 25°C rise                  | 413 | 499  | 564  | 601          | 671  | 746  | 774  | 791 |
| 30°C rise                  | 344 | 416  | 470  | 501          | 559  | 622  | 645  | 659 |
| 35°C rise                  | 295 | 356  | 403  | 429          | 479  | 533  | 553  | 565 |
| 40°C rise                  | 258 | 312  | 353  | 375          | 419  | 467  | 484  | 495 |
| 45°C rise                  | 229 | 277  | 313  | 334          | 373  | 415  | 430  | 440 |
| <b>50°C rise</b>           | 206 | 249  | 282  | <b>300</b>   | 335  | 373  | 387  | 396 |
| 55°C rise                  | 188 | 227  | 256  | 273          | 305  | 339  | 352  | 360 |

### PRODUCT DATA

|  |                | Ducted Exhaust   | Non Ducted Exhaust   |
|--|----------------|------------------|--|
| Heating Capacity <sup>1</sup>                            | kW             | 17.46            | 17.46  |
| Power Input <sup>1</sup>                                 | kW             | 4.01             | 4.01   |
| COP <sup>1</sup>   |                | 4.0              | 4.0  |
| Recovery @ 50°C Rise <sup>1</sup>                        | L/hr           |                  | 300  |
| Operating Range (ambient)                                | °C             |                  | 5-45   |
| Outlet Temperature                                       | °C             |                  | 65   |
| Refrigerant  |                |                  | R134a  |
| TPR Valve Setting (VE/SS)                                | kPa            |                  | 1000/850   |
| ECV Setting (VE/SS) <sup>3</sup>                         | kPa            |                  | 850 / 700  |
| <b>Maximum Water Pressure Supply</b>                     |                |                  |  |
| Without ECV (VE/SS) <sup>3</sup>                         | kPa            |                  | 800/680  |
| With ECV (VE/SS) <sup>3</sup>                            | kPa            |                  | 650/550  |
| Electrical Connection                                    |                | 3Phase/415V/50Hz |  |
| Max Current per Phase (running, incl pump)               | Amps           | 17.06            | 15.22  |
| Minimum Circuit Size (per phase)                         | Amps           |                  | 20   |
| Air Flow (at maximum static pressure)                    | L/s            |                  | 1600   |
| Maximum Static Pressure                                  | Pa             | 80               | 20   |
| Minimum Ventilation per inlet and outlet                 | m <sup>2</sup> |                  | 1  |
| Minimum room volume for indoor installation <sup>4</sup> | m <sup>3</sup> |                  | 7.5  |
| Sound Pressure Level                                     | dBA            |                  | 59@3m  |
| Approx Weight Empty                                      | kg             |                  | 120  |
| Approx Weight Full                                       | kg             |                  | 125  |
| Storage per Heat Pump                                    | L              |                  | 400-4,000  |
| <b>Clearances</b>  |                |                  |  |
| Evap Coil Side   | mm             |                  | 500  |
| Back (vertical discharge models)                         | mm             |                  | Nil  |
| Back (horizontal discharge models)                       | mm             |                  | 1200   |
| Display Side   | mm             |                  | 850  |
| Water Connections Side                                   | mm             |                  | 500  |
| Top (vertical discharge models)                          | mm             |                  | 1200   |
| Top (horizontal discharge option)                        | mm             |                  | Clearance above unit required for service personnel to stand |

### HEAT PUMP SIZING CHART

| Number of Heat Pumps in Parallel | 1  | 2               | 3  | 4  |
|----------------------------------|----|-----------------|----|----|
| Primary Pump                     |    | Grundfos CM 3-2 |    |    |
| Branch Size                      |    | 40              |    |    |
| Header Size                      | 40 | 50              | 65 | 80 |

Note: Header pipe sizing is based on a total length of 40m of primary flow and return piping and 20 bends, excluding equa-flow manifolds on storage tanks and heat pumps @ 1.2m/sec velocity. One pump per Heat Pump.

### ACCESSORIES

| Storage Tank        | Pump   | BMS Card            | LAN Cable |
|---------------------|--------|---------------------|-----------|
| 410L (VE)           |        | 17520 BACnet TCP/IP |           |
| 1000L to 5000L (SS) | CM 3-2 | 17521 BACnet MS/TP  | 17495     |
|                     |        | 17522 Modbus RS485  |           |

<sup>1</sup> 20°C ambient/60%RH. 39°C water in / 45°C water out.

<sup>2</sup> Non ducted models.

<sup>3</sup> ECV not supplied with water heater

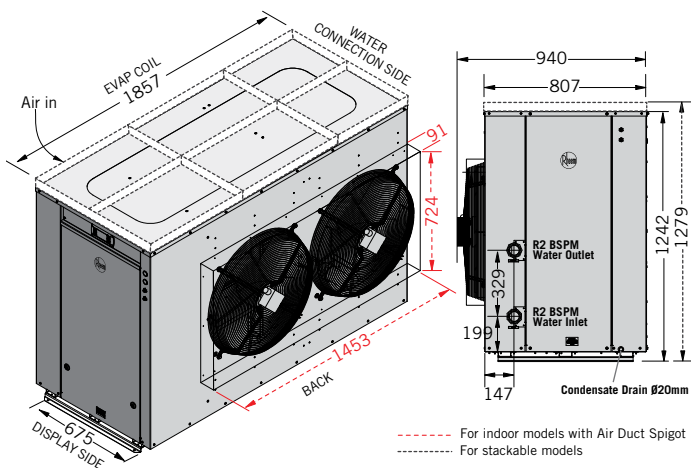
<sup>4</sup> To comply with AS1677.2, the minimum room size permissible is 7.5m<sup>3</sup> for 16kW and 17.73m<sup>3</sup> for 35kW per heat pump for indoor installation. A larger room size is recommended for efficient heat pump operation.

STEADY, HOT & STRONG

# AIR TO WATER 35kW MODEL TECHNICAL DATA

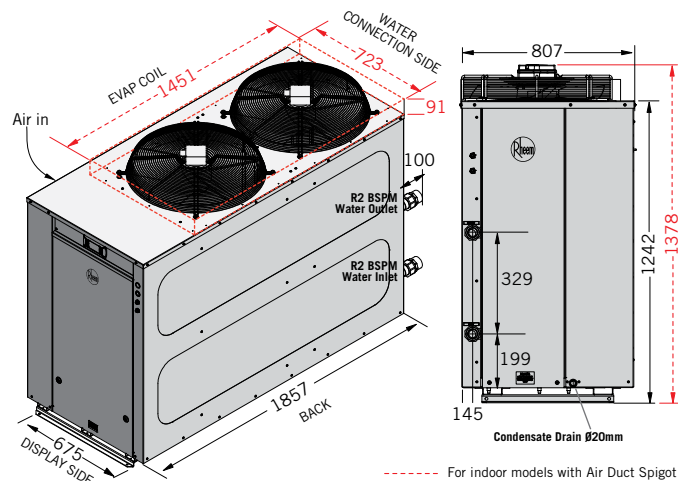
## 35kW AIR TO WATER – ALL HORIZONTAL DISCHARGE MODELS

953035H0 – Non Ducted    953035HS – Non Ducted stackable  
952035H0 – Ducted        952035HS – Ducted stackable



## 35kW AIR TO WATER – ALL VERTICAL DISCHARGE MODELS

95303500 – Non Ducted    95203500 – Ducted



### RECOVERY

| Ambient Temperature °C     | 5    | 10   | 15   | 20           | 25   | 30   | 35   | 40   |
|----------------------------|------|------|------|--------------|------|------|------|------|
| Output (kW)                | 25.5 | 29   | 34.6 | <b>39.55</b> | 46.6 | 49.9 | 53   | 54.1 |
| Recovery – Litres per hour |      |      |      |              |      |      |      |      |
| 20°C rise                  | 1097 | 1247 | 1488 | 1701         | 2004 | 2146 | 2279 | 2326 |
| 25°C rise                  | 877  | 998  | 1190 | 1361         | 1603 | 1717 | 1823 | 1861 |
| 30°C rise                  | 731  | 831  | 992  | 1134         | 1336 | 1430 | 1519 | 1551 |
| 35°C rise                  | 627  | 713  | 850  | 972          | 1145 | 1226 | 1302 | 1329 |
| 40°C rise                  | 548  | 624  | 744  | 850          | 1002 | 1073 | 1140 | 1163 |
| 45°C rise                  | 487  | 554  | 661  | 756          | 891  | 954  | 1013 | 1034 |
| <b>50°C rise</b>           | 439  | 499  | 595  | <b>680</b>   | 802  | 858  | 912  | 931  |
| 55°C rise                  | 399  | 453  | 541  | 618          | 729  | 780  | 829  | 846  |

### PRODUCT DATA

|  |                | Ducted Exhaust   | Non Ducted Exhaust |
|--|----------------|--|--------------------|
| Heating Capacity <sup>1</sup>                            | kW             | 39.55  | 39.55              |
| Power Input <sup>1</sup>                                 | kW             | 10.25  | 10.25              |
| COP <sup>1</sup>   |                | 3.9  | 3.9                |
| Recovery @ 50°C Rise <sup>1</sup>                        | L/hr           | 680  |                    |
| Operating Range (ambient)                                | °C             | 5-45   |                    |
| Outlet Temperature                                       | °C             | 65   |                    |
| Refrigerant  |                | R134a  |                    |
| TPR Valve Setting (VE/SS)                                | kPa            | 1000/850   |                    |
| ECV Valve Setting (VE/SS) <sup>3</sup>                   | kPa            | 850/700  |                    |
| <b>Maximum Water Pressure Supply</b>                     |                |  |                    |
| Without ECV (VE/SS) <sup>3</sup>                         | kPa            | 800/680  |                    |
| With ECV (VE/SS) <sup>3</sup>                            | kPa            | 650/550  |                    |
| Electrical Connection                                    |                | 380 - 415 Volts / 3 Phase / 50 Hz                            |                    |
| Max Current per Phase (running, incl pump)               | Amps           | 34.9   | 32.34              |
| Minimum Circuit Size (per phase)                         | Amps           | 40   |                    |
| Air Flow (at maximum static pressure)                    | L/s            | 5830   | 5270               |
| Maximum Static Pressure                                  | Pa             | 100  | 20                 |
| Minimum Ventilation per inlet and outlet                 | m <sup>2</sup> | 1.93   |                    |
| Minimum room volume for indoor installation <sup>4</sup> | m <sup>3</sup> | 17.73  |                    |
| Sound Pressure Level                                     | dBA            | 69@3m  |                    |
| Approx Weight Empty                                      | kg             | 300  |                    |
| Approx Weight Full                                       | kg             | 310  |                    |
| Storage per Heat Pump                                    | L              | 400-8,000  |                    |
| <b>Clearances</b>  |                |  |                    |
| Evap Coil Side   | mm             | 1000   |                    |
| Back (vertical discharge models)                         | mm             | Nil  |                    |
| Back (horizontal discharge models)                       | mm             | 2000   |                    |
| Display Side   | mm             | 850  |                    |
| Water Connections Side                                   | mm             | 600  |                    |
| Top (vertical discharge models)                          | mm             | 2000   |                    |
| Top (horizontal discharge option)                        | mm             | Clearance above unit required for service personnel to stand |                    |

### PUMP & PIPE SIZING CHART

| Number of Heat Pumps in Parallel | 1                | 2  | 3   | 4   |
|----------------------------------|------------------|----|-----|-----|
| Primary Pump                     | Grundfos CM 10-1 |    |     |     |
| Branch Size                      | 50               |    |     |     |
| Header Size                      | 50               | 80 | 100 | 100 |

Note: Header pipe sizing is based on a total length of 40m of primary flow and return piping and 20 bends, excluding equal-flow manifolds on storage tanks and heat pumps @ 1.2m/sec velocity. One pump per Heat Pump.

### ACCESSORIES

| Storage Tank        | Pump    | BMS Card             | LAN Cable |
|---------------------|---------|----------------------|-----------|
| 410L (VE)           | CM 10-1 | 17520- BACnet TCP/IP | 17495     |
| 1000L to 5000L (SS) |         | 17521- BACnet MS/TP  |           |
|                     |         | 17522- Modbus RS485  |           |

<sup>1</sup> 20°C ambient/60%RH. 39°C water in / 45°C water out.

<sup>2</sup> Non ducted models.

<sup>3</sup> ECV not supplied with water heater

<sup>4</sup> To comply with AS1677.2, the minimum room size permissible is 7.5m<sup>3</sup> for 16kW and 17.73m<sup>3</sup> for 35kW per heat pump for indoor installation. A larger room size is recommended for efficient heat pump operation.

# WATER TO WATER HEAT PUMP

FOR WHERE ENERGY EFFICIENCY IS ESSENTIAL



REDUCED CHILLING LOAD



UP TO 7.0 COP EFFICIENCY\*

## The Rheem Water to Water (W2W) range

includes units using R134a for hot water heating up to 65°C, with a minimum entering water temperature on the building chiller loop of 12°C, giving a return water temperature of 7°C, with the units being compact and suitable for indoor or outdoor installation.



### Efficiency

The ability of these units to provide a dual efficiency sees combined COPs of up to 7.0<sup>5</sup>. The efficiency in hot water production is up to 4.0<sup>5</sup> and this leads to substantial savings in energy use and heating cost. The savings are magnified where the cooling by-product lessens a building's chilling load. COP in cooling are up to 3.0<sup>5</sup>.

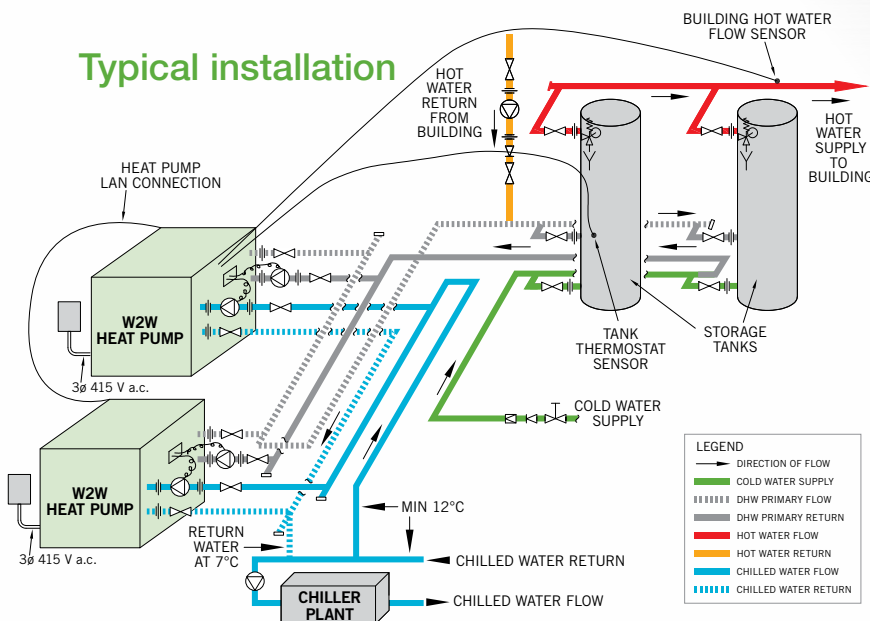
### Return on investment

High COP of this product results in a very favourable return on investment making the W2W HP both a sound environmental and financial investment compared to gas and electric heating systems.

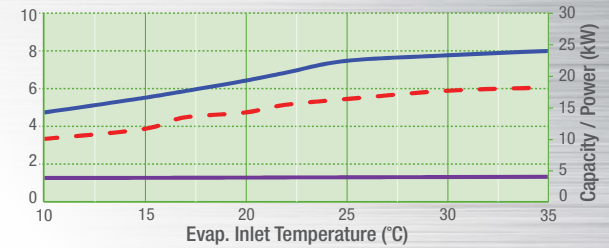
### More key features

- Water Mark certified 316L stainless steel, double-wall brazed plate heat exchanger on domestic hot water side
- Multiple safeties including low temperature freeze protection and flow switch on the chilled water side
- Full commercial construction with marine grade aluminium case

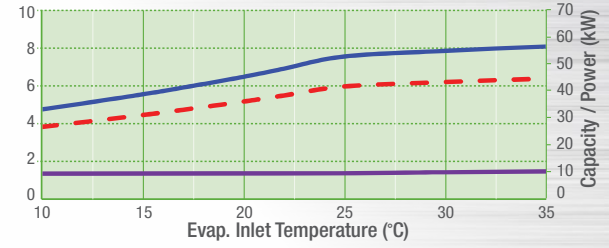
### Typical installation



15kW W2W HEATING COP GRAPH



35kW W2W HEATING COP GRAPH

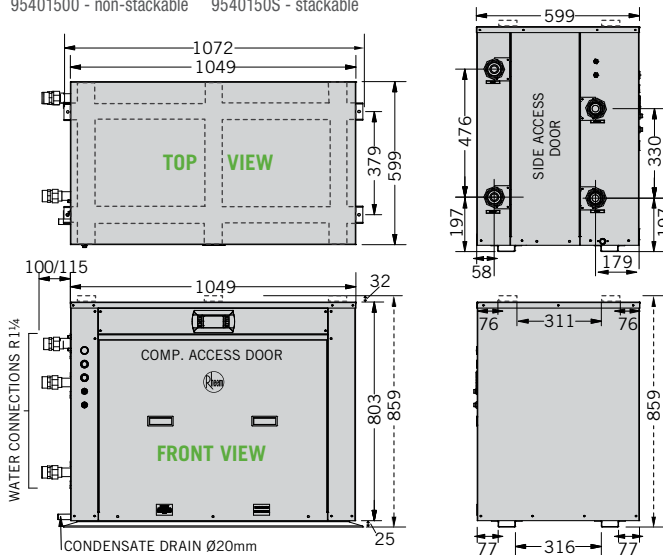


STEADY, HOT & STRONG

# WATER TO WATER 15kW & 35kW MODEL TECHNICAL DATA

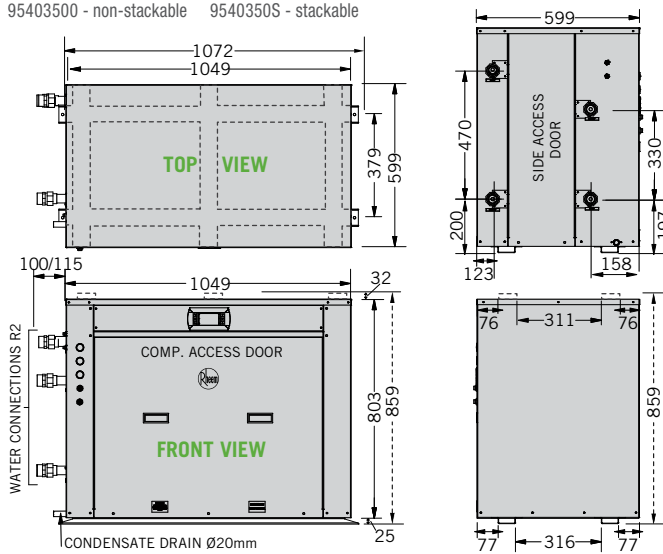
## 15kW MODEL

95401500 - non-stackable 9540150S - stackable



## 35kW MODEL

95403500 - non-stackable 9540350S - stackable



----- For stackable models

### PUMP & PIPE SIZING CHART

| No. of Heat Pumps in Parallel | 15kW            |    |    |    | 35kW            |    |     |     |
|-------------------------------|-----------------|----|----|----|-----------------|----|-----|-----|
|                               | HOT SIDE        |    |    |    | HOT SIDE        |    |     |     |
| Pump                          | 1               | 2  | 3  | 4  | 1               | 2  | 3   | 4   |
| Branch Size (mm)              | Grundfos CM 3-2 |    |    |    | Grundfos CM10-1 |    |     |     |
| Header Size (mm)              | 40              | 50 | 65 | 80 | 50              | 80 | 100 | 100 |
| No. of Heat Pumps in Parallel | COLD SIDE       |    |    |    | COLD SIDE       |    |     |     |
|                               | HOT SIDE        |    |    |    | HOT SIDE        |    |     |     |
| Pump                          | 1               | 2  | 3  | 4  | 1               | 2  | 3   | 4   |
| Branch Size (mm)              | Grundfos CM 3-2 |    |    |    | Grundfos CM10-1 |    |     |     |
| Header Size (mm)              | 40              | 50 | 65 | 80 | 50              | 80 | 100 | 100 |

| MODEL  | 15kW  | 35kW                |
|--|---|---------------------|
| Nominal Heating Capacity <sup>5</sup>                              | 15kW  | 34.75kW             |
| Nominal Cooling Capacity <sup>5</sup>                              | 11.3kW  | 25.9kW              |
| Power Input kW <sup>5</sup>  | 3.7kW   | 8.8kW               |
| Coefficient of Performance (Heating) <sup>5</sup>                  | 4   | 4                   |
| Coefficient of Performance (Cooling) <sup>5</sup>                  | 3   | 3                   |
| Maximum DHW Temperature  | 65 °C   |                     |
| Refrigerant  | R134a   |                     |
| <b>Hot Water Side</b>  |   |                     |
| TPR Valve Setting (VE/SS)  | 1000/850 kPa                                    |                     |
| ECV Setting (VE/SS) <sup>3</sup>                                   | 850/700 kPa                                     |                     |
| Maximum Water Supply Pressure                                      | 800/680 kPa                                     |                     |
| - Without ECV (VE/SS) <sup>3</sup>                                 | 800/680 kPa                                     |                     |
| - With ECV (VE/SS) <sup>3</sup>                                    | 680/550 kPa                                     |                     |
| Hot Water Side Flow Rate   | 1.1L/s  | 2.2L/s              |
| Heat Exchanger Heating Design                                      | 316L Stainless steel – Double wall brazed plate |                     |
| Design Heating Temperature Difference                              | 6 °K  |                     |
| Design Pressure Drop   | 40kPa   |                     |
| <b>Cold Water Side</b>   |   |                     |
| Maximum Water Supply Pressure                                      | 2450kPa   |                     |
| Cold Water Side Flow Rate  | 1.1L/s  | 1.85L/s             |
| Heat Exchanger Cooling Design                                      | 316L Stainless steel – Single wall brazed plate |                     |
| Design Cooling Temperature Difference                              | 5 °K  |                     |
| Design Pressure Drop   | 40kPa   |                     |
| Minimum room volume for indoor installation                        | 5.6m <sup>3</sup>                               | 15.34m <sup>3</sup> |
| Electrical Connection  | 3 Phase / 415V / 50Hz                           |                     |
| Max Current per Phase (running, incl pumps)                        | 13.96   | 29.94               |
| Minimum Circuit Size (per phase)                                   | 20A   | 40                  |
| Sound Pressure Level   | 59dBa @ 3m                                      |                     |
| Approx Weight Empty  | 100kg   | 120kg               |
| Approx Weight Full   | 105kg   | 125kg               |
| Storage per Heat Pump  | 400L to 4000L                                   | 400L to 8000L       |
| <b>Clearances</b>  |   |                     |
| Front  | 850mm   |                     |
| Back   | Nil mm  |                     |
| Water Connections Side   | 850 mm  |                     |
| RHS Side   | Nil mm  |                     |
| Top (clearance above unit required for service personnel to stand) | 0 mm  |                     |

<sup>5</sup> Rating Conditions: Heating 39°C Water in, 45°C water out, 51°C SCT, Cooling 12°C water in, 7°C water outlet, 2°C SST.

### ACCESSORIES

| Storage Tank        | Pump               | BMS Card             | LAN Cable |
|---------------------|--------------------|----------------------|-----------|
| 410L (VE)           | 2 x CM 3-2 (16kW)  | 17520- BACnet TCP/IP | 17495     |
| 1000L to 5000L (SS) |                    | 17521- BACnet MS/TP  |           |
|                     | 2 x CM 10-1 (35kW) | 17522- Modbus RS485  |           |

### RECOVERY

| Evaporator Inlet Temperature °C  | Model 95401500 |            |            | Model 95403500 |            |            |
|----------------------------------|----------------|------------|------------|----------------|------------|------------|
|                                  | 12             | 20         | 35         | 12             | 20         | 35         |
| Output (kW)                      | 15             | 19         | 24         | 34.75          | 45.9       | 55.9       |
| <b>Recovery- Litres per hour</b> |                |            |            |                |            |            |
| 20°C rise                        | 645            | 817        | 1032       | 1494           | 1974       | 2404       |
| 25°C rise                        | 516            | 654        | 826        | 1195           | 1579       | 1923       |
| 30°C rise                        | 430            | 545        | 688        | 996            | 1316       | 1602       |
| 35°C rise                        | 369            | 467        | 590        | 854            | 1128       | 1374       |
| 40°C rise                        | 323            | 409        | 516        | 747            | 987        | 1202       |
| 45°C rise                        | 287            | 363        | 459        | 664            | 877        | 1068       |
| <b>50°C rise</b>                 | <b>258</b>     | <b>327</b> | <b>413</b> | <b>598</b>     | <b>789</b> | <b>961</b> |
| 55°C rise                        | 235            | 297        | 375        | 543            | 718        | 874        |

## CASE STUDIES

### SYDNEY OPERA HOUSE NEW SOUTH WALES

Rheem commissioned the installation of 2x Water to Water heat pumps deep within the Opera House structure.

Energy is drawn from the harbour to provide DHW for kitchen, washrooms and back of house.

The system is operating at a COP 7.0 which led to the 4 Star Green Star performance rating.



### RSIC BUILDING, CANTERBURY UNIVERSITY CHRISTCHURCH

Rheem installed 18 Air to Water heat pumps with 2x2000L stainless steel storage tanks to provide all the potable hot water for this large science facility over the Summer period when the large heating boilers were not in operation.

The system operates at a COP 4 and the 18 units are manifolded in 3 banks of 6 and linked to the two storage tanks.



### SOUTHERN OCEAN LODGE SOUTH AUSTRALIA

Southern Ocean Lodge is our very first installation of Rheem commercial Air to Water heat pump in 2008 providing efficient use of diesel generators for domestic hot water.



**Let Rheem solve your next hot water problem.**

Phone your local Rheem technical advisory service on 0800 657 336



TECHNICIANS WITH  
EXPERT PRODUCT  
KNOWLEDGE



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MEET AUSTRALIAN  
& NZ STANDARDS



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TO GENUINE  
SPARE PARTS



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RHE311 by TIH on September 2019

STEADY, HOT & STRONG

INSTALL A RHEEM™