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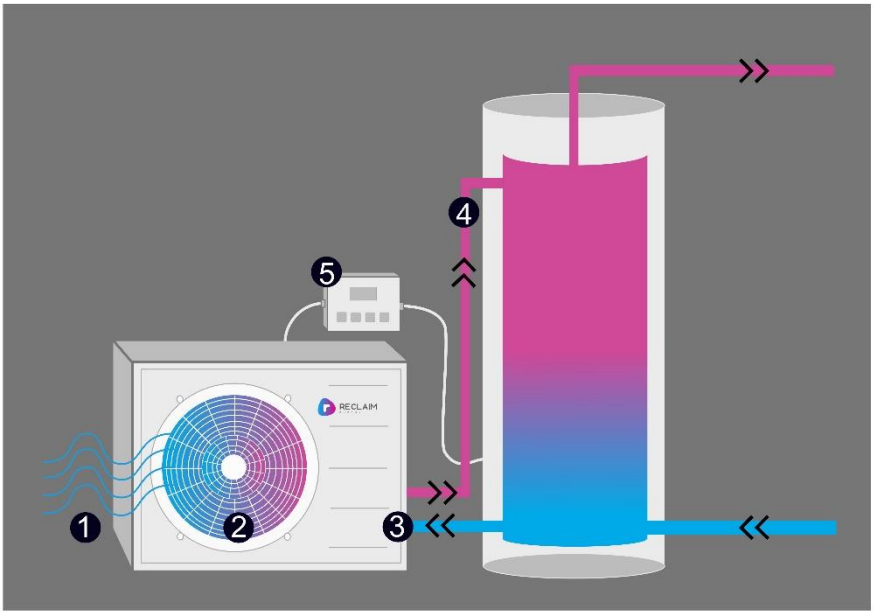
Reclaim CO_2 Hot Water Heat Pump

Design & Specification Guide

Product Overview

A Reclaim Energy hot water heat pump will reduce the energy used and environmental impact of domestic hot water by up to 80%. It is suitable for most homes and small commercial projects, providing up to 700L DHW at 63°C per day.

Reclaim heat pump is a split system, with outdoor compressor and either indoor or outdoor hot water cylinder. A household accessible controller runs the heat pump and can be adjusted to suit householder requirements.



1. Heat energy in air absorbed by natural CO2 refrigerant
2. Reclaim compressor concentrates heat energy in CO2 refrigerant and transfers heat to water
3. Cold water from cylinder is pumped through Reclaim compressor and heated to 63°C
4. Cylinder is heated from top down with hot water from Reclaim compressor
5. Reclaim controller turns of heat pump once sensor in cylinder reaches 59°C

System Sizing

There is one Reclaim Energy heat pump, suitable for most homes. It will provide up to 700L of hot water per day.

The heat pump is connected to a 300L hot water cylinder to store adequate amounts of hot water to ensure there is always hot water available for the household. The cylinder can be indoors or outdoors. Other cylinder sizes are possible in very low or high demand situations, contact us to discuss options.

Specification summary

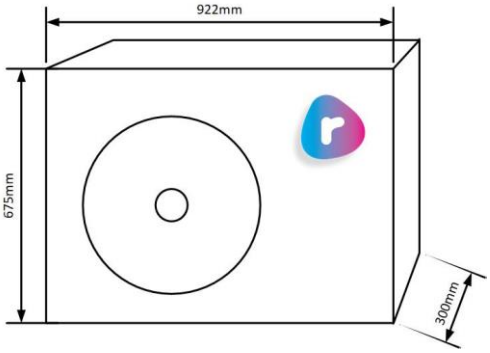
- ✓ Reclaim compressor outdoor – ground or wall mounted
- ✓ Cylinder outdoor OR indoor – 300L stainless steel recommended
- ✓ Maximum pipe between compressor & cylinder to be 15m total length & 5m height difference
- ✓ Reclaim controller to be cylinder mounted - outdoor or indoor

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Design Guide

1. Choose heat pump location



a. Heat pump compressor will be <u>always outdoor</u>; ground or wall mounted.
b. Compressor dimensions 675 x 922 x 300 mm
c. The compressor is very quiet (37db at 1m) and therefore can be located close to bedroom windows with minimal disturbance to occupants. In addition, the controller can be set to only run during daytime if required.
d. Check clearances to obstructions as diagram below.
e. For wall mounting use RE WALL kit (requires M12 bolts or coach screws to wall framing, not supplied)

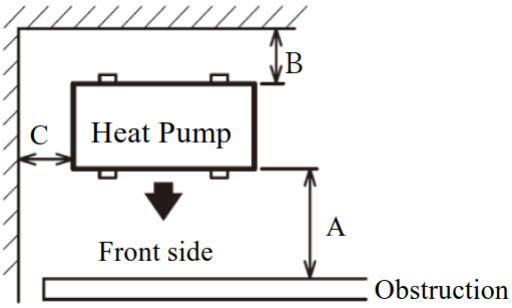
<u>Compressor clearances:</u>

A : 350mm or greater if the height of the obstruction is less than 1,200mm

600mm or greater if the height of the obstruction is 1,200mm and higher

B : Minimum 150mm

C : Minimum 150mm



2. Choose hot water cylinder location

a. Cylinder can be located <u>either outdoor or indoor</u>.

b. Check locations against allowable distance between compressor & cylinder.

Maximum <u>total</u> pipe length	10m	12.7mm copper or 20mm plastic	Recommended for outdoor cylinder
	15m	20mm plastic or 15mm copper	Recommended for indoor cylinder

Note: Pipework between compressor & cylinder should be minimised to optimise performance. No fittings that restrict flow should be fitted in pipework. Elbows to be minimised and all bends radiused.

c. All pipework **<u>must be insulated</u>** - 19mm wall thickness Zone 1 & 2, 25mm in Zone 3.

3. Choose hot water cylinder

Reclaim CO2 heat pumps can be fitted to any 300L or larger hot water cylinder. This is to ensure there is enough volume of stored hot water to meet demand while optimising Reclaim performance and savings.

- ✓ For indoor cylinders we recommend a Rinnai 300L stainless steel cylinder (MS30055030).
- ✓ For outdoor cylinders we recommend a Rheem 300L stainless steel cylinder (MPSS 32530005-0A)
- ✓ Alternatively enamel lined cylinders can be used – Rinnai indoor (ME30059030) or outdoor (ME340685E36)

Contact us to discuss other cylinder options.

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Installation Planning Guide

Reclaim hot water heat pumps are a single pass system, drawing cold water from the bottom of the cylinder and always returning 63°C to the top of the cylinder. The flow rate will vary depending on ambient air temperature and therefore the compressors operating efficiency (co-efficient of performance/CoP). The controller manages the operation of the compressor, ensuring enough hot water and disinfection of Legionnaire's. There is no need for an electric element, although one can be optionally wired as a back-up but must never be used in normal operation.

Refer to the Reclaim manual for full installation instructions. Summary pre-line and install information below.

1. Reclaim with outdoor cylinder pre-line guide

Plumbing

- Hot and cold water domestic pipework terminations to cylinder location
- Standard strapping and drainage details for outdoor cylinder

Electrical

- Controller will be mounted on cylinder
- 10A 230V power supply for Reclaim compressor in proximity to heat pump location, with outdoor rated isolator for wiring to compressor
- 5A 230V power supply for Reclaim controller in proximity to hot water cylinder location, with outdoor rated 3 pin socket for plugging in controller
- The cylinder element is not required for Reclaim operation and should never be left on with Reclaim working. The element can be optionally wired as per cylinder manufacturer's details as a back-up if desired.

2. Reclaim with indoor cylinder pre-line guide

Plumbing

- Flow and return water pipework will be required between compressor and cylinder.
- Maximum water temperature in the pipe will be 63°C, at a flow rate of 5L/minute.
- Pipework between compressor and cylinder to be sized as per table above in Design Guide.
- Pipework must be insulated – Zones 1 & 2 = 19mm, Zone 3 = 25mm wall thickness
- Penetrations for pipework to be appropriately weather sealed as per cladding manufacturers requirements.
- Pipework to be terminated at compressor location, see diagram on last page for dimensions.
- All cylinder pipework, drainage, strapping and other requirements to be as per cylinder manufacturers requirements.

Electrical

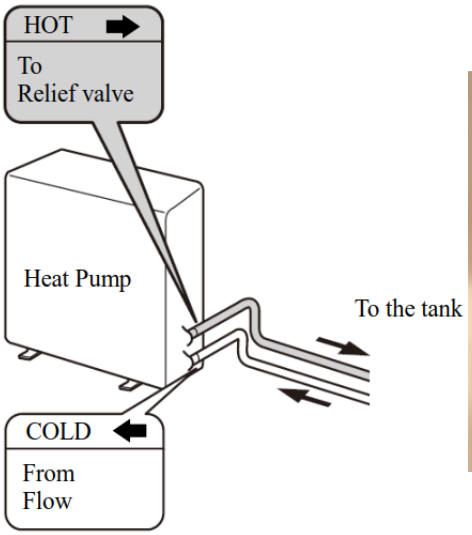
- Controller will be mounted directly on cylinder or on wall beside cylinder
- CAT5e RJ45 cable with plugs at either end to be run between controller location and heat pump compressor outside (10m cable supplied with controller, if not required then locally supplied)
- 10A 230V power supply for Reclaim compressor in proximity to heat pump location, with outdoor rated isolator for wiring to compressor

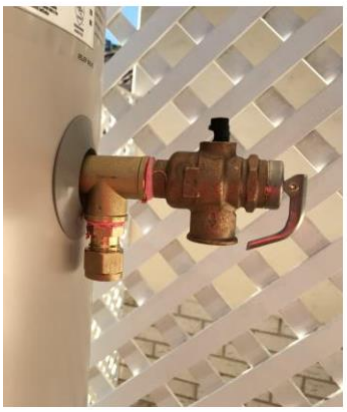
- 5A 230V power supply for Reclaim controller next to hot water cylinder, with 3 pin socket for plugging in controller
- The cylinder element is not required for Reclaim operation and should never be left on with Reclaim working. The element can be optionally wired as per cylinder manufacturer's details as a back-up if desired.

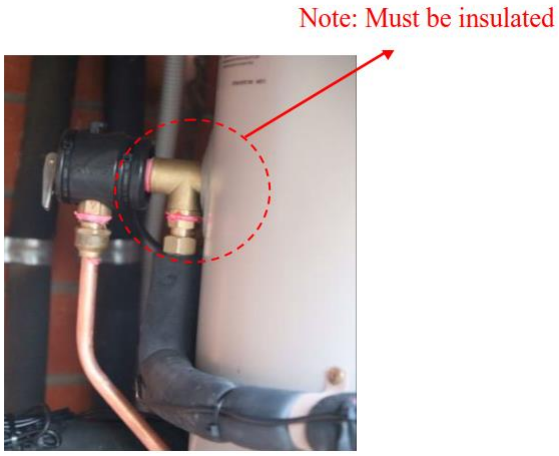
3. Plumbing connections to all cylinders

- Cylinder connections for heat pump flow and return pipework are as follows:

Flow from cylinder to compressor (cold)	Spare cold-water inlet of cylinder or tee on cold water pipework after all cylinder valves
Return from compressor to cylinder (hot)	Tee on TPRV port of cylinder (tee supplied with compressor)







4. Sensor housing at cylinder

The heat pump operation is managed by the controller, using a temperature sensor at the cylinder to register temperature and manage running times.

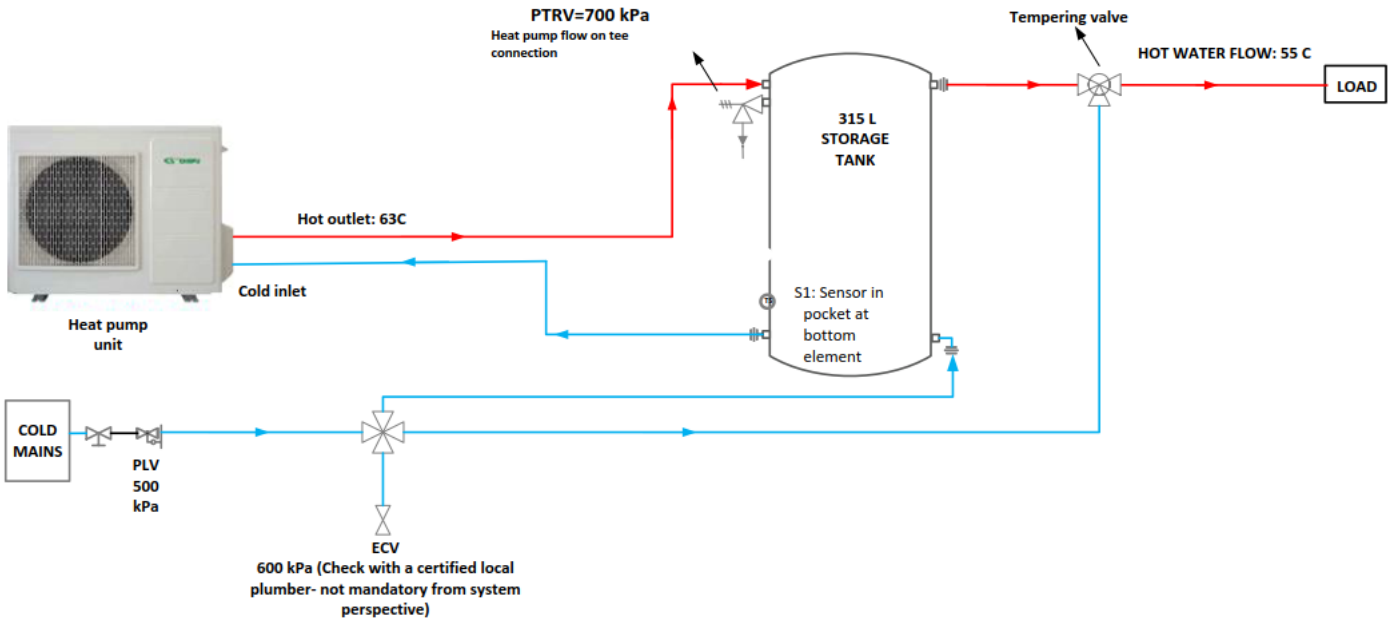
It is therefore CRITICAL that the sensor is reading an accurate temperature and is correctly installed.

If the cylinder has a submerged thermostat pocket in the bottom element housing this should be used for the sensor, pushed as deeply as possible.

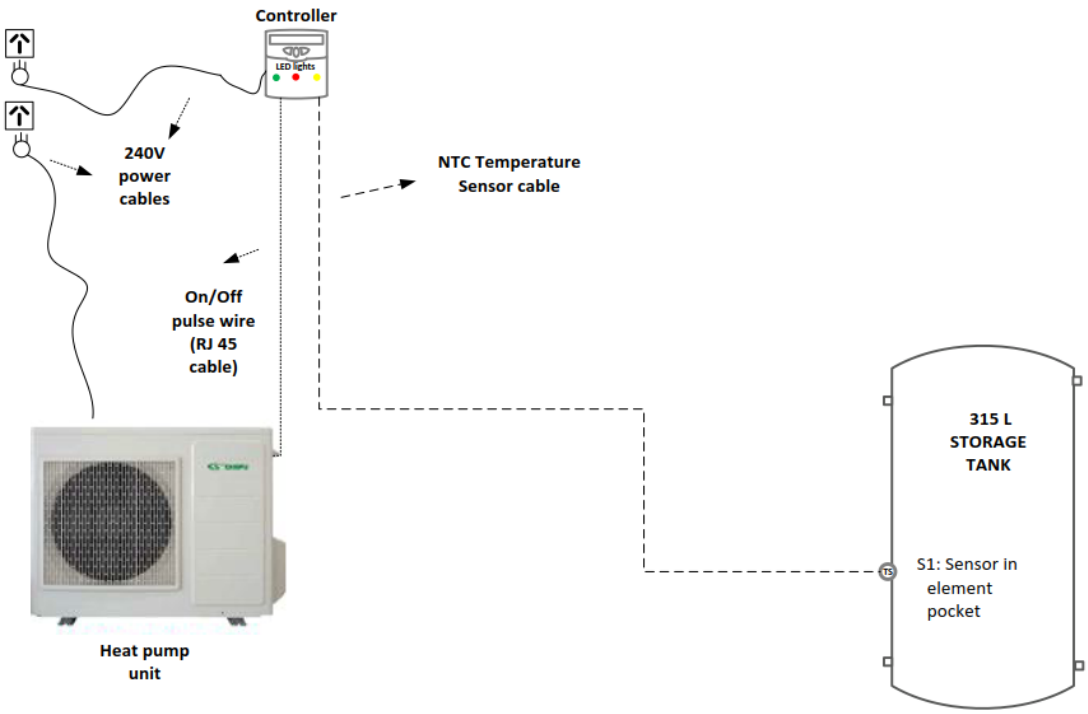
If the cylinder does not have a thermostat pocket a horizontal gap in the insulation against the inner tank barrel should be carefully made with a screwdriver. The sensor should then be securely pushed between the insulation and the cylinder barrel. Ensure the whole body of the sensor is against the cylinder and the cable is secured so it cannot come loose or be pulled out.

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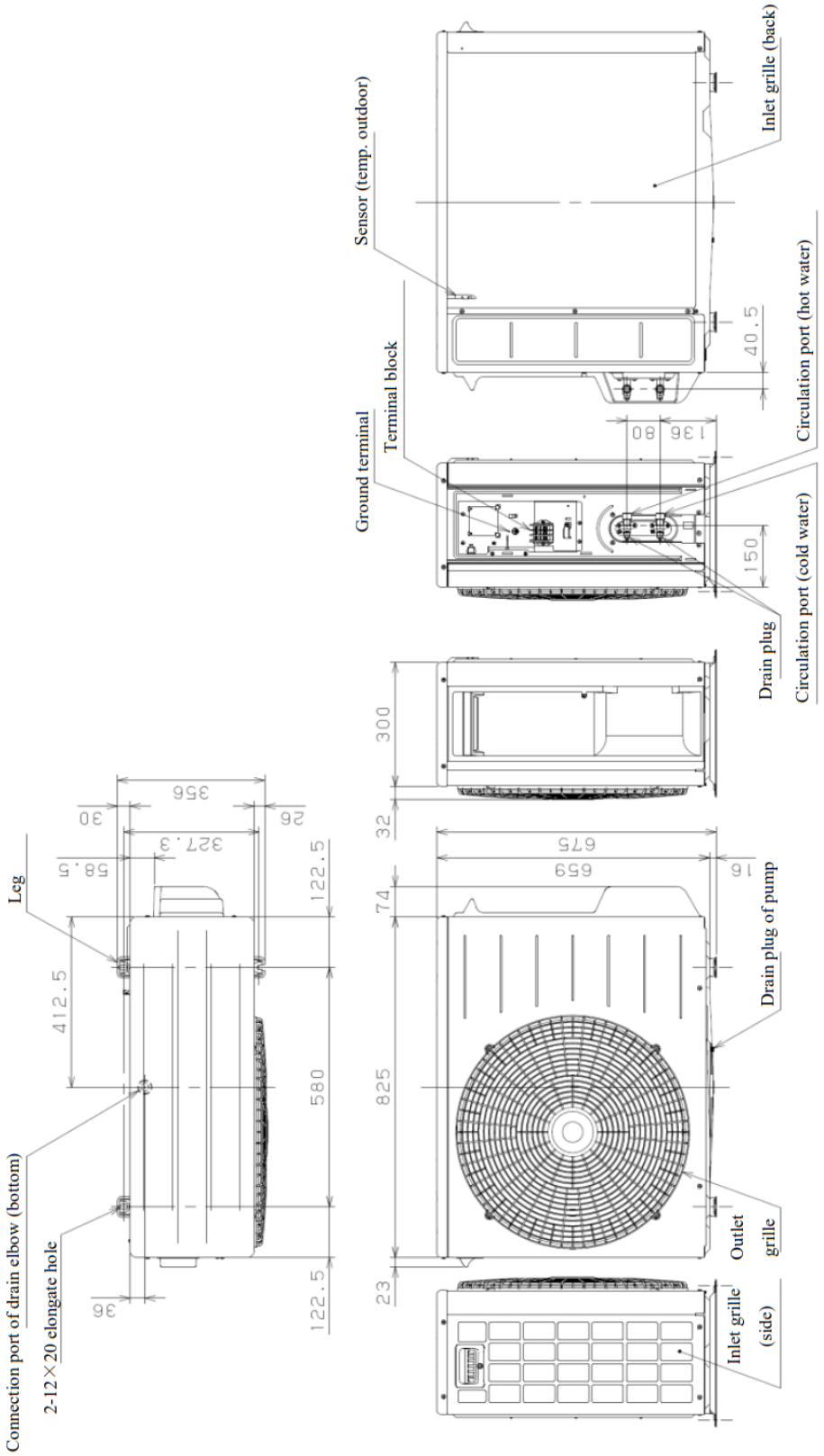
Plumbing diagram



Wiring diagram



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Inlet grille (back)
Sensor (temp. outdoor)
40.5
136
80
Circulation port (hot water)
Terminal block
Ground terminal
150
Drain plug
Circulation port (cold water)
300
32
675
659
16
74
Drain plug of pump
825
Outlet grille
23
Inlet grille (side)
356
30
26
327.3
58.5
122.5
Leg
412.5
580
122.5
36
Connection port of drain elbow (bottom)
2-12×20 elongate hole