

Compress 7001iAW **Air to water heat pumps**



 **WORCESTER**

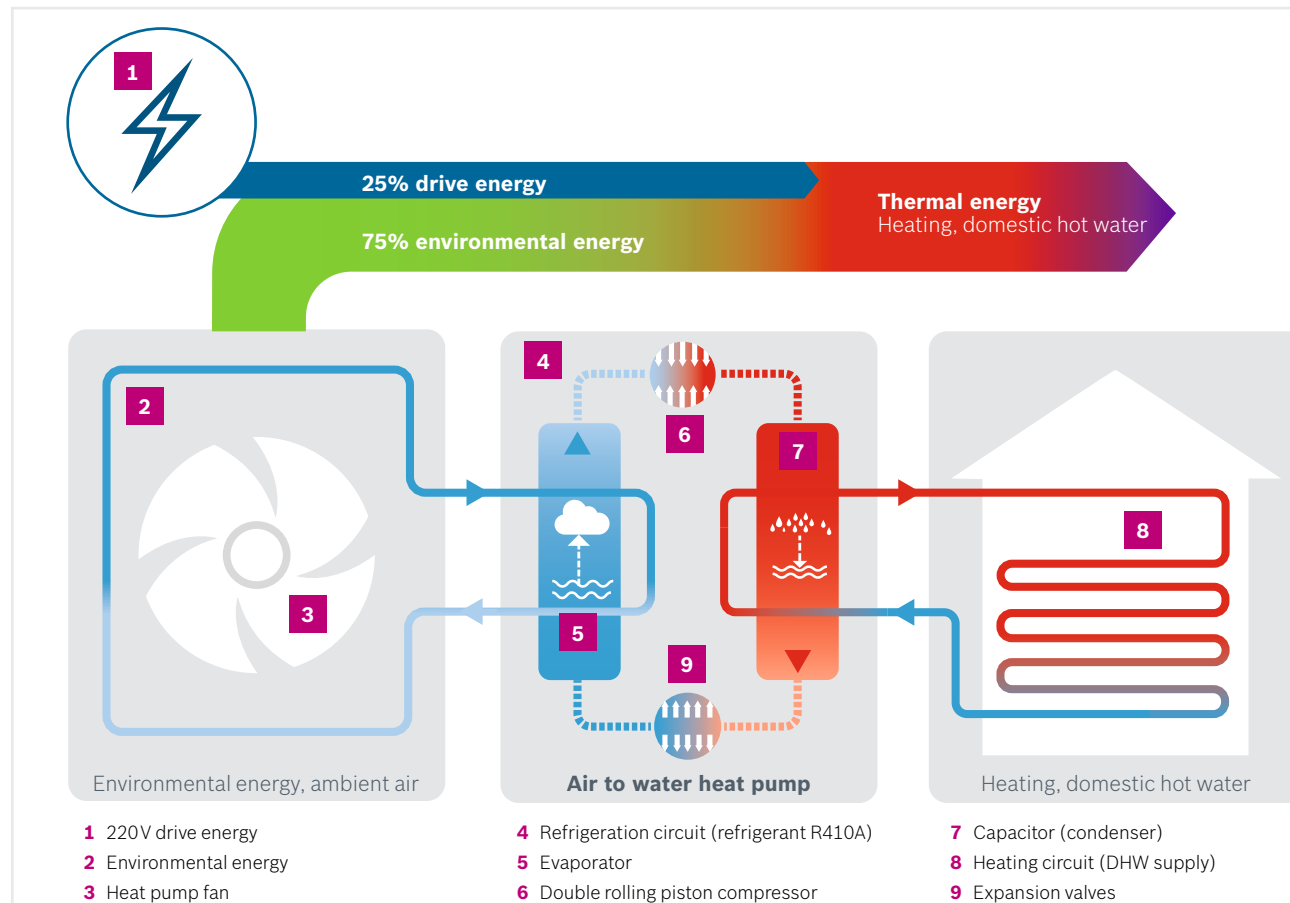
 **BOSCH**

Engineering

Air to water heat pumps operating principle

Space and domestic hot water heating with air to water heat pumps

Air to water heat pumps work on the "refrigerator principle". Whereas a refrigerator draws heat out from its interior and pushes it outside, a heat pump draws heat from outside and pushes it inside the house as heat energy. The ambient air is used as a primary regenerative energy source for space heating and domestic hot water. This equates to approx. 75 % environmental energy, with the remaining electricity coming from either the grid or from renewable energy sources.



Air to water heat pumps operating principle

- 1 Power connection**
The air to water heat pump needs electrical energy to operate, which is supplied either by utility companies or by a PV system.
- 2 Environmental energy**
The energy of ambient air is used as the primary source of energy.
- 3 Fan**
The modulating fan draws in ambient air and discharges cold air from the refrigeration circuit into the environment.
- 4 Refrigeration circuit**
The securely sealed refrigeration circuit ensures the smooth running of heating and cooling operations.
- 5 Evaporator**
Inside the evaporator, the drawn-in air heats the refrigerant until it reaches a gaseous state.
- 6 Compressor**
The compressor, which is driven by an electric motor, uses high pressure to raise the temperature of the refrigerant to approx. 80 °C.
- 7 Capacitor**
Inside the capacitor, the heating circuit absorbs the thermal energy of the gaseous refrigerant, causing it to cool down and return to a liquid state.
- 8 Heating circuit**
The hot water in the heating circuit is approx. 55 °C and can be used for heating and for domestic hot water.
- 9 Expansion valves**
By lowering the pressure in the refrigeration circuit, the evaporation reaction (**5**) is prepared again.

Appliance type

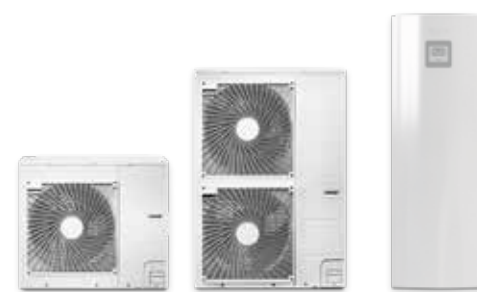
Understanding monoblock versus split system

Air to water heat pumps comprise of either a monoblock and split design. Here's an overview of how they work and perform. Learn more about our Compress 7001iAW with a monoblock design and its many benefits of installation.



Monoblock design

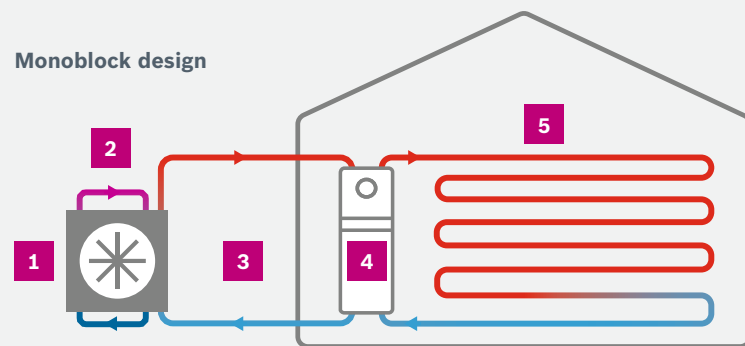
- ▶ Easy installation and quick to integrate into heating hydraulics
- ▶ Complete refrigeration circuit in the outdoor unit
- ▶ Heat production in the outdoor unit (evaporator, compressor, condenser)
- ▶ Heat transfer within the heating circuit in the outdoor unit
- ▶ Low-maintenance, hermetically sealed refrigeration circuit
- ▶ Piping between outdoor unit and indoor unit is a separate hot water circuit
- ▶ Well insulated piping for high efficiency (up to 30m)



Split design

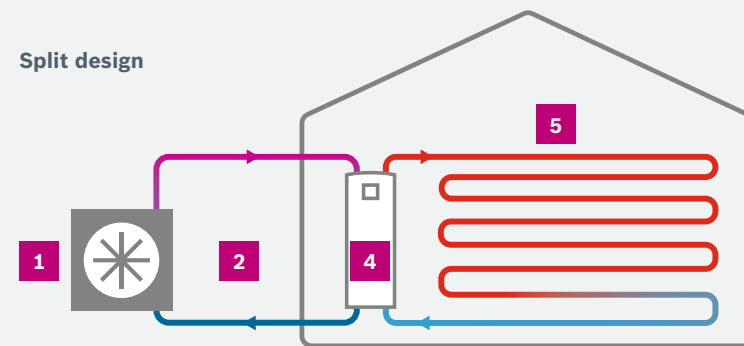
- ▶ Advancement of existing split air conditioning units to heat pumps
- ▶ Refrigeration circuit split across two device units
- ▶ Heat production in outdoor unit (evaporator, compressor)
- ▶ Heat transfer in the indoor unit (condenser)
- ▶ Routine leakage tests on refrigeration circuit
- ▶ Piping between outdoor unit and indoor unit is part of the refrigeration circuit
- ▶ Flexible installation options thanks to long pipes (up to 50m)

Monoblock design



- 1 Heat pump
- 2 Refrigeration circuit
- 3 Heating circuit for heat pump
- 4 Indoor unit
- 5 Heating circuit for house

Split design



System

Compress 7001iAW system

An air to water heat pump system comprises of an air to water heat pump (outdoor unit) and an indoor unit in various configurations. The hydraulics of the indoor unit are connected to the homeowner's heating and hot water circuit and guarantee a reliable supply of thermal energy.

Outdoor units

- ▶ Outputs between 5 kW and 17 kW
- ▶ Suitable for renovation and new build projects (depending on the building)
- ▶ Heating mode from -20°C to 35°C (outside temperature)
- ▶ Cooling mode from 15°C to 45°C (outside temperature)
- ▶ Ultra low-noise operation
- ▶ High efficiency due to inverter technology



Compress 7001iAW

Indoor units

- ▶ Pre-configured hydraulic units for quick and simple installation
- ▶ Floor-standing tower unit with integral 190l DHW cylinder
- ▶ Wall-mounted unit for system flexibility



AWM tower unit 190l DHW cylinder



**AWE with electric
booster heater**

Inside the unit

Heat pump components

All refrigeration circuit components in the monoblock design are contained in the outdoor unit. This means the heating process and the heat transfer takes place in the outdoor unit. Furthermore, all important components such as the inverter, and control, filter and circuit boards are also housed in the outdoor unit.

The system specific indoor unit can be selected based on the customer's requirements and the operating conditions of the air to water heat pump. Wall-mounted indoor units (AWE) contain the control and the hydraulic components that connect them with the customer's heating and domestic hot water circuits. Floor-standing indoor units are also fitted with an integral DHW cylinder (AWM). All indoor units feature an integrated IP interface.

Outdoor unit

- 1 Evaporator
- 2 Modulating fan
- 3 Double rolling piston compressor
- 4 Condenser (capacitor)
- 5 Two electronic expansion valves
- 6 Inverter
- 7 Weather-proof housing made from EPP

Indoor unit (AWE)

- 8 Integrated IP interface
- 9 High efficiency circulation pump
- 10 Electric booster heater
- 11 Expansion vessel
- 12 Electrical junction box

Indoor unit (AWM)

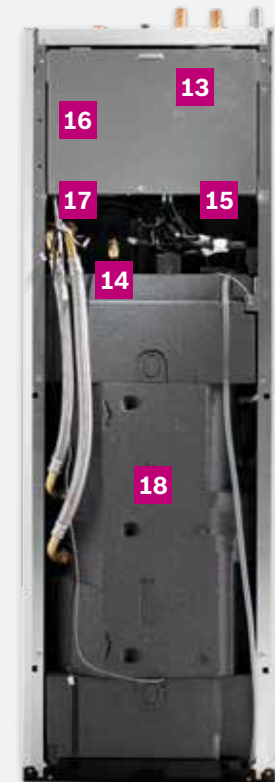
- 13 Integrated IP interface
- 14 Manual air vent
- 15 High efficiency circulation pump
- 16 Electric booster heater
- 17 Expansion vessel
- 18 Integrated DHW cylinder (190 litres)



Outdoor unit air to water heat pump



AWE indoor unit



AWM indoor unit

System options

Compress 7001iAW and AWM Tower unit



Compress 7001iAW
5 - 17kW

AWM tower unit
with 190l DHW cylinder

CR10H controller

Optional buffer
50 litre buffer vessel
(If required)

RETROFIT OR NEW BUILD

-  Suitable for small to medium properties
-  To suit most hot water demands

System solutions for compact installations

The heat demand of a new build or existing property is a decisive factor when choosing the right type of air to water heat pump.

The AWM indoor unit enables a compact installation. The unit comes supplied with many of the necessary hydraulic system components fitted, in addition to an integrated domestic hot water cylinder to provide a more compact installation.

System options

Compress 7001iAW and AWE Wall hung unit with external DHW cylinder



Compress 7001iAW
5 - 17kW

AWE indoor wall hung unit

HR200 and HR300 DHW cylinder
Cylinder sized according to property requirement

CR10H controller

RETROFIT OR NEW BUILD

 Suitable for small to medium properties

 To suit most hot water demands

System solutions for demanding lifestyles

The heat demand of a new build or existing property is a decisive factor when choosing the right type of air to water heat pump.

The AWE wall hung indoor unit gives system flexibility, with outputs up to 17kW and domestic hot water external cylinders options to suit more demanding lifestyles

Control

Indoor unit user interface

Our air to water heat pumps are controlled and operated via the indoor unit. The HPC 410 control unit is built into the indoor unit of the air to water heat pump. This makes controlling our entire heat pump system simple.

External CR10H room controller is also available for additional user comfort.



HPC 410 control unit
(integral to indoor unit)



CR10H

An easy to use remote control with the HPC410 for room temperature setting. Provides error messages from the heat pump and integrated room humidity sensor for room cooling (when selected).



AWE



AWM



Smart Home

Integrated internet interface

Bosch air to water heat pumps and air conditioning units can be controlled via the HomeCom Easy app. The app interacts with your system whether you are at home or out and about for continuous comfort. Ongoing development ensures the heat pump will integrate seamlessly into intelligent Smart Home systems.

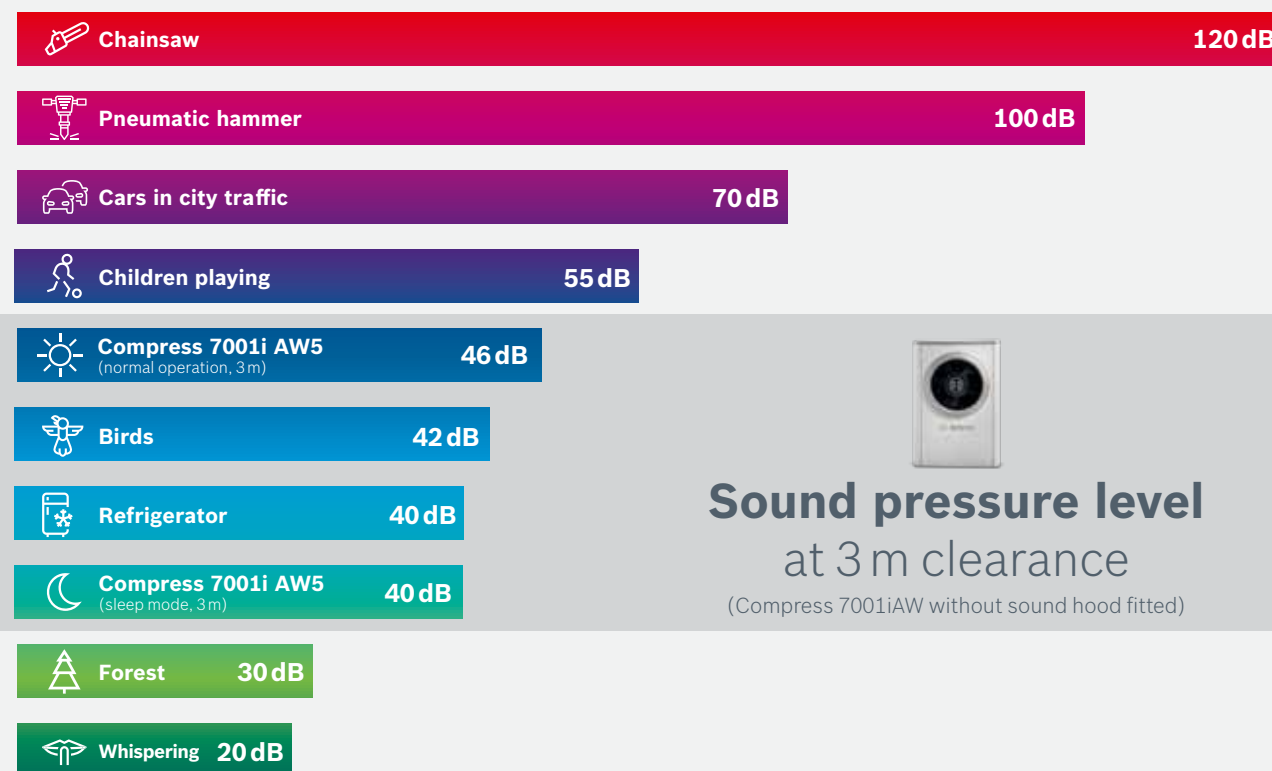


Information

Sound insulation optimisation

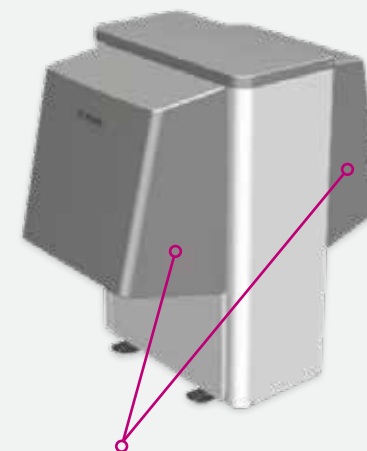
Sound levels

The sound level of outdoor air to water heat pumps installed are measured in decibels. Depending on local regulations, residential areas are sometimes subject to specific noise levels during the day and/or at night. Air to water heat pumps can be optimised to a certain degree to comply with even the strictest noise regulations.



Sound pressure level
at 3 m clearance

(Compress 7001iAW without sound hood fitted)



Sound-insulating hood for noise reduction
(Optional accessory for Compress 7001iAW)

Information

Good to know

SCOP (Seasonal Coefficient of Performance)

In order to operate, an air to water heat pump must be supplied with energy in the form of electrical current. Together with environmental energy, thermal energy is produced to provide heating and domestic hot water.

An important indicator of a heat pump's efficiency is its SCOP value. This value shows how much thermal energy (in kW) the heat pump produces for every kW of electrical current supplied, averaged out across one year.



The Heat Pump KEYMARK is a voluntary, independent European certification mark for all heat pumps, combination heat pumps and hot water heaters (as covered by Ecodesign, EU Regulation 813/2013 and 814/2013). The certification provides third party test measurements but also includes factory production control and quality management audits. The scheme is now accepted by all participating Certification Bodies.

In Ireland, the HP KEYMARK is an acceptable source of Ecodesign data for heat pumps and is used in the publication of energy performance certificates and building regulation compliance checks.

In the UK, certified products are approved in the eligibility list for the Domestic Renewable Heat Incentive (RHI), therefore HP KEYMARK certification can be used to apply for products to be listed on the MID database.

Outdoor installation

When installing an outdoor unit, minimum distances must be maintained from house walls, pavements and patios. The heat pump should be freely accessible from all sides. Tight or enclosed spaces are best avoided. Unit-specific measurements can be found in the heat pump's installation instructions.

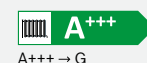
A concrete foundation with drainage must be provided at the installation site of the outdoor unit. **Ensure that cables and heating pipes running from the outdoor unit to the indoor unit are well insulated.**



Energy consumption labelling

EU directive
(2017/1369)

Air to water heat pumps are heating systems and, depending on the indoor unit connected, can also function as water heaters. As such, they are subject to the EU-wide energy labelling regulations.



A+++ → G

Energy efficiency class A+++ for heating capacity



A → G

Energy efficiency class A for domestic hot water heating

The labels A → G represent the spectrum of different energy efficiency classes.

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