

# Heat Pumps

### What is a heat pump?

A heat pump is essentially a device that moves heat from one space to another. Heat pumps have the ability to either bring heat into a house or take it out.

### How does a heat pump work?

#### Heating

Heat pumps have an outdoor unit and an inside unit. Heat is brought in from the outside air where it is transferred into the home using a fan. Even at 0°C the air still holds heat, so at any time heat can be brought in from outside. The outdoor unit, or evaporator, absorbs the heat from outside and moves it inside. Once the refrigerant picks up heat it is condensed and sent through to the indoor unit, or condenser. The condenser then rejects the heat into an air handler, which moves the heated air through the house.

#### Cooling

Heat pumps also have the ability to cool homes during warmer periods by working in reverse. In cooling mode the outdoor unit becomes the condenser thus forcing the indoor unit to work as the evaporator. The indoor unit then collects the heat within the home. The evaporator absorbs the heat from inside and takes it to the condenser where it is rejected into the outside air.

### What carries the heat?

Refrigerant is used to carry heat. When compressed, it is a high-temperature, high-pressure liquid. When refrigerant expands it turns into a low-temperature, low-pressure gas. This gas is highly effective at absorbing heat.

### The benefits of a heat pump

Modern heat pumps (also known as a reverse cycle air conditioner) are consistently building a good reputation as not only an excellent climate control system but as an environmentally friendly heating and cooling solution.

Heat pumps are one of the most cost-effective climate control systems available and provide heating and cooling "on demand." With a heat pump you get both a heating and cooling solution in one package. Modern heat pumps gently increase or decrease power to maintain the desired temperature within the home as soon as it is turned on, which means no more stopping and starting. This makes heat pumps more efficient and economical to run. Another benefit of the heat pump is



that when a room has reached its desired temperature, the output of air will drop as will the intensity of the fan. This means a more comfortable and less draughty source of heat.

Heat pumps (if sized and installed correctly) are generally able to reach and maintain the desired room temperature in 10–15 minutes.

### Aurora Preferred Suppliers – Heating & Cooling

Aurora Preferred Suppliers – Heating & Cooling have been carefully selected and accredited by Aurora for their expert knowledge and professional service. Aurora Preferred Suppliers – Heating & Cooling are also backed by AOK, the Aurora Service Guarantee, which means that if the job's not done right, it's fixed.

#### PROS

- Extremely efficient running costs (approx. 1/3 of the cost of a fixed fan heater)
- Instant heating/cooling on demand
- Safe
- No exposed or hot surfaces
- Remote control available
- Programmable thermostat/timer options
- Detachable air filters for regular cleaning
- Most heat pumps will also have secondary filters for air purification and minor dust/pollen particles
- Aurora Heating Discount may apply.

#### CONS

- Generally higher purchase/installation costs
- Can be draughty if not installed correctly.

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## Choosing a heat pump

- Make sure the heat pump is sized correctly. Undersized heating equipment will mean that your heating system may not be able to reach the temperature that you require, while oversizing involves needless expense and may lead to discomfort and inefficient operation due to higher fan speeds and greater temperature differences. (An Aurora Preferred Supplier is recommended.)
- Like most whitegoods, heat pumps now come with star rating labels. The labels for heat pumps (or reverse-cycle models) have two bands of stars:
  - The blue band shows the efficiency when cooling.
  - The red band shows the efficiency when heating.
- The more efficient the heat pump is, the more stars it earns. Choose a heat pump with the highest star rating for the area needed.

## Heat pump efficiency

- Make sure the airflow around the unit isn't obstructed, as this will affect efficiency and the operation of your heat pump. This is for both the indoor and outdoor units.
- The temperature of a heated room in winter should be between 18–21°C.
- The temperature of a cooled room in summer should be about 23–26°C. (The humidity indoors will be low, so it will feel cooler.)
- Make the most of the timer mode on your heat pump.
- When a cold day is expected, turn on the heat pump early rather than wait until the building becomes cold as the heat pump operates more efficiently when the outside air temperature is warmer. (This is also advised on cooling mode.)
- Keep windows and doors closed when using a heat pump.
- Don't try to heat the whole house with room heat pumps, especially if they have only been sized to do the room.
- Close curtains on hot summer days and cold winter nights.
- Outdoor shading of windows in summer is recommended to help on cooling mode.

- If the machine has adjustable louvers, adjust them towards the ceiling when cooling, and towards the floor when heating (as cool air falls, hot air rises).
- Follow the manufacturer's instructions for filter cleaning, but as a rule cleaning should be done at least once a month. Since the filters are cleaning the air by removing dust and – in most modern heat pumps – pollen, the filters will accumulate dust build-up. If this dust is not removed the heat pump will work inefficiently.
- Don't stand or place furniture in front of your heat pump. This may disrupt the airflow and temperature of the room.
- Make sure the ceilings are insulated. A minimum insulation rating of R4 is recommended in Tasmania.

## Should a heat pump be run overnight?

- If you choose not to run your heat pump overnight when there are low ambient temperatures, you risk the possibility of freezing the outside coil more often, which in turn triggers numerous defrost periods first thing in the morning. When you turn your heat pump on it has to work at its maximum capacity to bring the room back to the temperature it was prior to switching off the night before.
- On cold mornings, the temperature in your house may be as little as 10°C warmer than the outside temperature. This will in turn make your heat pump work harder and defrost more often. Running your heat pump overnight at a reduced temperature setting will improve its efficiency.
- If you were to run it overnight, you would lower the temperature to its lowest setting, usually about 16°C.

## Further information

For further information about heating and cooling your home or business please contact Aurora on:

**Residential customers**                      **1300 13 2003**

**Business customers**                      **1300 13 2045**

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