

“THE HEAT PUMP FILES”

UNDERSTANDING DEFROST CYCLE



During winter months many heat pumps will need to go through a “defrost” cycle during operation. Often this has not been explained well before installation, which leads to a lot of confusion about why the heat pump is not working. This document is provided to help users understand the defrosting cycle and address any concerns.

What is a “defrost cycle”?

In heating mode a heat pump extracts heat from the outside air and transfers it inside your premises to warm it. When the ambient temperature outside gets very cold (close to 0°C or below) the moisture in the air freezes on the outdoor unit’s heat exchanger as the fan blows the air across it. A defrost cycle is simply the system recognising that ice has formed or begun to form and automatically fixing this.

Why does my unit have to do a defrost cycle?

Any ice building up on the outside heat exchanger reduces the airflow across it, which will effect the efficiency, sometimes reducing it dramatically. In extreme cases this can also cause damage to the outdoor unit.

How do I tell if my unit is in a defrost cycle?

Inside you will notice the unit will stop heating, the indoor fan will stop and depending on the model there will usually be some form of visual indication like a light on the unit (usually the “run” light) will blink continuously. Outside, the outdoor fan will also have stopped and the compressor will be running.

How often will my unit go in to defrost mode?

There are a number of factors that influence how often a unit will go in to defrost mode. Some of these include:

- The outdoor temperature and humidity
- The amount of heating load the unit is trying to deliver
- The condition of the heat pump system.

There are timers built in to the computer control of the unit that restrict how often defrosting can occur. Generally a unit must run for a minimum of around 35 minutes after starting up before completing its first defrost. From there defrosts should occur no more frequently than approximately every 35 minutes.

Once my unit is defrosting how long will it take?

Either of two factors can bring the unit out of a defrost cycle. Firstly, if the sensors on the outdoor unit detect that it’s heat exchanger temperature has risen enough, the unit will stop defrosting. Secondly, if the sensors do not stop it beforehand, the maximum time a unit will be in defrost cycle is around 10 minutes.

It is important not to stop the unit before the defrost cycle has ended, because if the unit is restarted shortly afterwards it will run very inefficiently and may cause damage to itself.

My unit is defrosting frequently / not delivering enough heat – what could be wrong?

Regular defrosting, or a lack of heat could be caused by a number of factors.

If the unit has operated like this since it was first installed (first cold snap), you may be operating it incorrectly or it may be undersized for the space it is trying to heat. Initially you should consult your instruction manual to ensure you are operating the unit correctly. If this doesn’t remedy the problem you should consult your installer or another reputable heat pump installer. They can assist you to ensure correct operation, and correct sizing.

If the unit is undersized for the space it is not faulty. The responsibility for correctly sizing the unit initially rests with the installing company – they will need to remedy the situation if the unit is too small.

A recently developed problem may be an indication of a fault or maintenance required. You can perform some basic maintenance yourself by cleaning the filters on your indoor unit, and ensuring that your outdoor unit is clear of foliage and the heat exchanger is not blocked. If this doesn't remedy the problem you should consult your installer or another reputable heat pump installer.

[Is there any way I can help to reduce defrosting?](#)

Yes there certainly is. Keep your unit well maintained (as above) and ensure you are operating it correctly. This will help a lot.

Of course the less load you place on the unit the less frequently it will need to defrost in cold conditions. Ultimately permanent fixes such as installing insulation in ceilings, walls and under floors will help reduce your heating requirement (and ultimately save you money). More immediately, keeping doors closed and curtains drawn will also help to reduce your heating required.