

ASHP INSTALLATION TIPS

To help installers looking at fitting **AIR SOURCE HEAT PUMPS**, Paul Greengrass, Product Development Director from DiversiTech, provides some tips on installation.

DiversiTech International (formally known as Pump House) has been working in the UK heat pump sector for over 15 years - working with OEM's, wholesalers and training organisations to help provide the best installation solutions to deliver heat from the heat pump into the home.

We are a design and manufacturing business which has created a range of installation accessories to assist installers fitting heat pumps in a cost-effective and efficient way.

TWO KEY FUNCTIONS

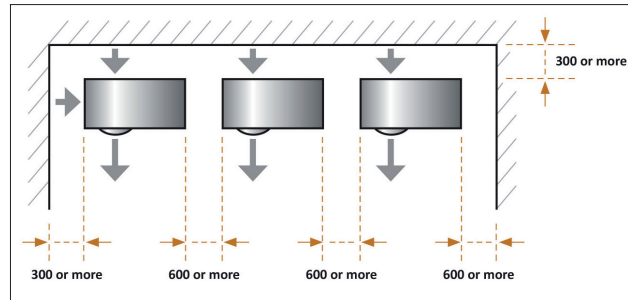
Air source heat pumps are extremely efficient, electrically driven heating systems, with the main power being consumed by the compressor. The standard refrigeration cycle being applied has been used for many years, with two key functions - compression to produce heat and expansion to provide cold (complemented with the compression and evaporation, which are the other two important functions of the refrigeration cycle).

Through the processes mentioned above, heating of the water within the system can be achieved in an economical manner to provide water to radiators, underfloor heating and for domestic hot water.

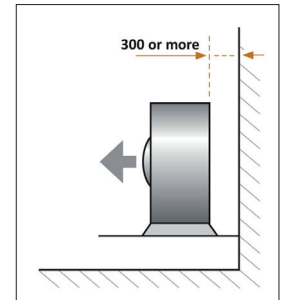
BASIS OF A HEAT PUMP

In its basic form, the heat pump acts in a similar way to a boiler - energy in and heating out. However, the key difference (besides that of operation) is that most boilers are typically fitted inside a home while the heat pump sits outside the home (either partly or as a whole).

The heat pump heating cycle provides a coefficient of performance between



THE HEAT PUMP REQUIRES GOOD AIRFLOW TO ENSURE IT OPERATES TO ITS OPTIMUM



THE DIVERSITECH TYPE 2 BRACKET COMES WITH A CROSSBAR TO ALLOW FOR CORRECT SPACING OF THE ARMS. SHOWN IS THE CBR2 WITH 3 ARMS

“ It is extremely important to work with the heat pump manufacturer's instructions to ensure adequate air flow is provided. ”

3 and 4, so for every 1kw of electrical energy consumed by the unit the home receives 3 to 4Kw of useable heat (or 300-400% efficiency), as opposed to a gas boiler only achieving around about 92% efficiency.

KEY FACTORS TO CONSIDER WHEN INSTALLING HEAT PUMPS

The heat pump requires good airflow to ensure it operates to its optimum. All heat pump manufacturers will have diagrams showing each individual unit requirements. The fan on the units will

move between 20m³ to 40m³ of air across the coil.

It is extremely important to work with the heat pump manufacturer's instructions to ensure adequate air flow is provided.

Any reduction or restriction in airflow will increase the demand on the unit's compressor and will increase electrical consumption, higher fuel bills, and shorten equipment life. A restriction around the heat pump may also obstruct the airflow of the fan - in turn affecting static pressure of fan.

External units can either be installed on the floor or wall mounted. Wall mounting brackets need to allow for sufficient rear air space to ensure optimum efficiency is maintained - the length of the arm is critical to allow this to happen. When units are mounted on the floor, rear air space also needs to be considered.



FLEXIBLE HOSE

“ DiversiTech International (formerly known as Pump House) has been working in the UK heat pump sector for over 15 years ”

The monobloc (air to water) model typically requires 22mm or 28mm copper pipe and taking into account the distance away from the wall of the property, also requires a flexible connector (typically a stainless-steel braided hose). These are similar to those used on taps and shower pumps.

quickly when exposed to the external environment. Air conditioning systems would normally have black Class O insulation - which has a high fire and smoke rating, but this is also not ideal in an external UV environment and can break down within a few years. When this break down occurs the insulation properties are affected, and again the heat pump compressor must work harder and therefore consume more electricity.

DiversiTech has undertaken site assessments and using thermal imaging cameras have shown the impact of heat loss when pipework and fittings are not

adequately insulated. To combat this, all of our hose sets come with Class O insulation with a coating that is UV-stable and rodent and bird proof.

BRIDGING THE GAP

The pipework from the unit needs to pass through an external wall of the property and to avoid heat loss via the brickwork due to cold bridging, the pipes need to be insulated all the way through to the inside of the house.

The external coil deliberately runs very cold and can produce condensation or frost in cold temperatures. This will

INSULATION

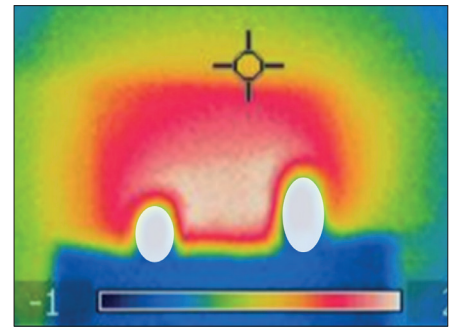
When you consider that the heat being generated by the heat pump is flowing through the pipework, if the pipe being routed is outside, it is critical that all pipework and connections are covered by an external grade weather and UV-stable insulation.

The normal grey coloured polyethylene insulation used inside a house is not UV-stable and breaks down very

HEAT LOSS INTO THE EXTERNAL BRICKWORK

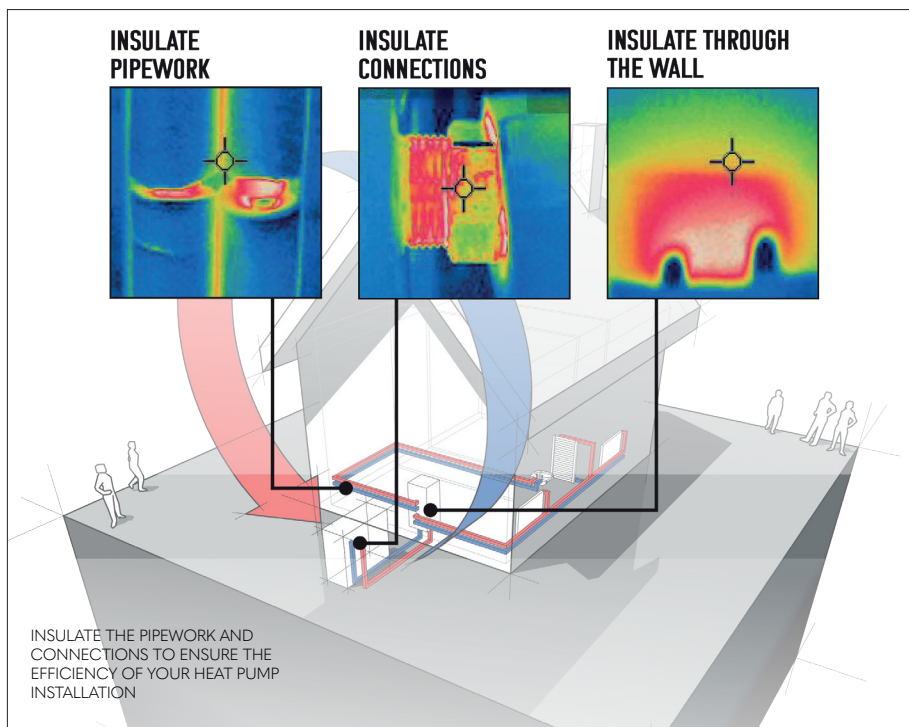


THE CONNECTION OF THE PIPEWORK RUNNING THROUGH THE WALL



THERMAL IMAGES SHOWING JUST HOW MUCH HEAT IS LOST WHEN THESE CONNECTIONS ARE NOT ADEQUATELY INSULATED

ARE YOU GETTING 100% OF THE ASHP HEAT INTO YOUR PROPERTY?



THE HAZARDS WHEN YOUR INSTALL DOES NOT HAVE ADEQUATE SOAK AWAY

require a quick defrost cycle typically built into the heat pump controls. The units can produce between 1,500 to 3,000 litres of condensate per year, which will need to be directed to a drain* or soak away to avoid icy patches around the unit. The condensate is not the same as the mildly acidic condensate from boilers - so does not require neutralising - and can go straight to a rainwater drainage or a soak away.

* For R290 charged units the condensate must go to a soak away and not a drain