Press Release

NEW UNIT OFFERS FREE HOT WATER FOR ALL WITH AIRCON

Now building owners can wash their hands of boilers

Mitsubishi Electric has continued its advance into the heating market with an innovative new product that offers any building with air conditioning the potential for free hot water up to 70ºC.

The PWFY City Multi water heater uses advanced heat pump technology to transfer excess heat from a VRF system to offer buildings a constant supply of hot water. The new unit comes in two versions which deliver water temperatures of either 70ºC or 45ºC and builds on the groundwork of Mitsubishi Electric's successful PQFY system launched two years ago.

"This is the first of its type in the air conditioning industry and is another example of how we can capitalise on the heat recovery potential of VRF systems to provide incredible energy efficiency within a building's services," commented Product Marketing Manager, Philip Ord.

Modern building regulations call for ultra-energy efficient, air tight premises and this, coupled with legislation on air quality and the temperatures that staff can be allowed to work within mean that air conditioning is a fact of life in almost all of our commercial buildings.

"With advances in VRF technology we can now offer incredibly efficient heat pump systems that can balance the delicate requirements of staff comfort with the need to offset the heat produced by the myriad of computer and other electrical equipment that are now an essential part of business," added Ord.

However, even with the most modern equipment available today, there is a limit to the amount of heat recovery that can be used in this way.

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The UK has a temperate climate that is ideal for heat recovery but even with the very best design, it is simply not possible to completely balance a system in an optimum way all of the time.

“That means there is further potential for heat recovery and this is where the thinking behind our new PWFY water heating units came from,” explained Ord. “What we have tried to do is look at where there are other needs for a heating load within a building and see where the excess energy from heat recovery can be used. Hot water is therefore an obvious target and we have designed a product that can even work with off-the-shelf water cylinders to provide customers with added functionality, ease and convenience.”

Figures from Defra’s Market Transformation Programme (2006) show that the provision of heating and hot water accounts for over 50% of energy consumption in non-domestic buildings. Initial modelling from the Defra study of gas and oil-fired water heating boilers and warm air and radiant systems resulted in annual carbon emissions of 10.8 MtC.

The model also shows that there is a link between gas boiler efficiency and age ranging from 50% efficiency for a pre-1979 gas boiler to 81% for boilers from 2007 onward. Providing hot water through the heat recovery process of heat pumps can offer average COPs of 4+ or efficiency levels of 400% in comparison.

“It is difficult to find accurate figures of the size of the commercial boiler market but even if the general inefficiencies of the national grid are taken into account, it is obvious that something delivering a performance of 400%+ is going to give you a better carbon reduction performance and a much more efficient delivery system than something working at 81%,” explained Ord.

Linking a heat pump water heater to an outdoor thermostat means it can be made to work either once the ambient outdoor temperature rises above 15ºC or during the night, using off-peak electricity and the partial load efficiencies of a modern VRF system. At 15ºC and above, most buildings will start to require some level of cooling, so heat can be recovered and this energy can be diverted to provide hot water.

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Below that temperature, any system will have more of heating requirement and any heat recovery in the system will need to be utilised to ensure that the air conditioning system is operating as efficiently as possible.

In spring and autumn, there will always be some days where heat recovery is not used for hot water and others where the cooling demand means that it can be used, but if all VRF air conditioning systems were optimised in this way, we could completely replace the need for carbon-based water heating systems. Just think what that could do for the energy efficiency levels of the country – and the energy bills of hard pressed businesses!

In winter, when it is unlikely to get much above 15ºC during the day, then systems will not divert any of the heat recovery to heat water and will use the water heated during the night when there is little requirement from the air conditioning system. This will still give a very efficient average COP of 3 or higher.

The flagship PWFY HWS-BU model offers a completely new design that delivers 70ºC in heating. The single model works with a YHM-R2 City Multi air conditioning system and has dimensions of 300 (W) x 450 (D) x 800 (H) to also offer plant room saving capabilities. The unit has two plate heat exchangers to offer a max/min water flow rate of 0.6 – 2.15 m3/h. COPs will average 4 or higher although this will be dependent on the loading of heating / cooling / hot water.

The heat pump boiler uses the vapour compression cycle of the air conditioning system to raise the water temperature, instead of simply discharging any excess heat from the refrigerant to the air as in a conventional split type air conditioner.

“This effectively provides free hot water and is far more fuel efficient than other systems of water heating, helping to reduce running costs,” added Ord. “It is also around four times better than the most efficient type of conventional gas boiler on a kW / kW basis, leading to a substantial reduction in CO_2 emissions.”

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The PWFY-AU has been launched as an addition to the current PQFY and offers 45ºC in heating and 5ºC in cooling. There are 2 models in the range a 12.5kW and a 25kW offering average COPs of 3.5 – 4.3. The AU models have a single plate heat exchanger with the same dimensions as the BU unit.