APPLICATION STORIES
NUOS - HEAT PUMP WATER HEATERS
Working Principle

1 - The refrigerant fluid crosses the evaporator and absorbs the heat from the air drawn in by the fan. This process ensures that the refrigerant changes phase by evaporating.

2 - The compressor increases the pressure of the refrigerant gas which causes it to increase in temperature.

3 - Inside the condenser, the refrigerant gas passes its heat to the water contained inside the cylinder. This exchange process ensures that the refrigerant begins returning to its original liquid state by condensing.

4 - The refrigerant fluid loses further pressure and temperature by passing through the expansion valve, completely returning to its original state.
FLEXIBLE PROGRAMMING

With the NUOS heat pump water heater, it is possible to set two water draw off times.

By monitoring both the stored water and the ambient air temperatures NUOS will start automatically to ensure that the stored water reaches the desired temperature at the time set by the user.

ANTI-LEGIONELLA FUNCTION

To guarantee maximum safety and hygiene, NUOS heat pump water heaters feature the anti-legionella function.

This function regularly heats the contents of the tank to 65ºC in order to pasteurise the stored water.

GREEN

If GREEN mode is selected, only the heat pump works, ensuring the most efficient operation.

BOOST

If BOOST mode is activated, the heat pump and heating element work at the same time. This mode has to be manually selected by the end user every time hot water is required in as short a time as possible.

AUTO

In Auto mode only the heat pump works. However, should the set temperature be higher than 55ºC or the ambient temperature is low (0ºC), the heating element is activated, in order to achieve max energy saving and the max quantity of hot water.
**LEGEND**

1. Compressor
2. Fan
3. Evaporator
4. Hot Water Outlet
5. Cold Water Inlet
6. Electric Element (1kW +1.5kW)
7. Condenser
8. User Interface
9. Expansion Valve
Shaftesbury, Dorset -
3 Bedroom, Terraced house

An Ariston NUOS 250i heat pump water heater has been installed as part of a refurbishment project at the three-bedroom terraced house of a Shaftesbury resident in North Dorset.

The property is located in the picturesque area of Gold Hill, which is renowned as the location of the Hovis bread commercials.

The installation, which was completed in February 2013, was managed by Dorset Energy Solutions. The original hot water cylinder was replaced by the NUOS heat pump water heater for use alongside a solar PV system, which would provide the electricity to power the Ariston product.

Martin Perrin, Technical Director of Dorset Energy Solutions, said: “We already knew what the NUOS was capable of, as we have one installed at our showroom. We recommended the product for this project because it was more than capable of meeting the property’s hot water needs while running in conjunction with the existing PV system – which could actually power the heat pump water heater.

The installation itself was extremely straightforward, especially as there was already adequate ducting in place on an external wall, allowing the exhaust air to be sent directly outside the premises. We definitely recommend the NUOS as a renewable energy product of choice.”

“We definitely recommend the NUOS as a renewable energy product of choice”

Martin Perrin, Dorset Energy Solutions

With a CoP of 2.8 (tested in accordance with EN 16147), the NUOS is capable of raising the water temperature to 55°C with just the heat pump [a back-up immersion is present to bring the temperature to 65°C] making it an ideal solution for off gas properties or as a replacement for existing electric only cylinders. It also features an intelligent control system which allows the end-user to program two separate times for hot water to be available. The heat pump water heater was also recognised for its efficiency in the 2012 edition of Construction Products Innovation and Achievement (CPIA).

Furthermore, to guarantee safety and hygiene, the NUOS includes an anti-legionella function, which regularly heats the contents of the cylinder to 65°C in order to sterilise the stored water. The cylinder also has a five year guarantee and the electrical components are guaranteed for two years.
An Ariston NUOS FS 200 heat pump water heater has been installed to cater for the hot water demands of The Glencairn pub and restaurant in Dumbarton, Scotland, following a consultation between its owners and local plumbing and heating company Alternagas Ltd.

“These savings, in addition to solving the water delivery issues and legionella compliance, have made the NUOS a first class answer to the water heating problem.”

John Lavery, Alternagas Limited

The decision to fit the NUOS arose after Alternagas Ltd’s Director, John Lavery, set up an energy monitor on the venue’s old immersion heater in November 2012, following concerns from the pub’s owners about water heating costs. He was dismayed to discover that, on average, 38kWh per day was being consumed to heat the hot water. This, coupled with water delivery problems from low temperatures and high usage, resulted in Ariston’s NUOS heat pump water heater being installed in January 2013.

John then fitted the energy monitor to the NUOS and was very impressed with the results, as he explained: “The average reading is now down to 13kWh a day on the AUTO setting, so there are even better savings to be made when the air temperature goes up and the GREEN mode is activated. These savings, in addition to solving the water delivery issues and legionella compliance, have made the NUOS a first class answer to the water heating problem.”

Plus, as the NUOS is installed in the cellar area, the pub’s owners have also reported cooler beers and the need for less refrigeration, as the exhaust air from the product is helping to keep the room temperature at the level required.

As a result, both John and the owners of The Glencairn pub and restaurant have reported that they are very impressed with the heat pump water heater.

With a CoP of 3.7 @ 20ºC (EN 255-3), the NUOS is capable of raising the water temperature to 55ºC with just the heat pump (a back-up immersion is present to bring the temperature to 65ºC) making it an ideal solution for off gas properties or as a replacement for existing electric only cylinders.

NUOS also features an intelligent control system which allows the end-user to program two separate times for hot water to be available. The heat pump water heater was also recognised for its efficiency in the 2012 edition of Construction Products Innovation and Achievement (CPIA).

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Aldershot -
12 newly built, apartments

12 newly built, one-bedroom apartments in Aldershot have each been fitted with an Ariston NUOS FS250i floor-standing air source heat pump water heater.

“We needed to ensure that the new properties would benefit from getting 10% of their energy from a renewable source.”

Phil Davey, Davey Developments

The products have been installed to ensure carbon emissions are reduced by a minimum of 10% through the provision of onsite renewable energy, in accordance with Level 3 of the Code for Sustainable Homes.

Commenting on the specification of the NUOS units, Phil Davey, Director of Davey Developments, said: “We needed to ensure that the new properties would benefit from getting 10% of their energy from a renewable source.”

“After finding out about the NUOS range, I was invited by Ariston to look around their factory to familiarise myself with the product. Once its renewable credentials had been explained to me, it became apparent that the NUOS would enable the apartments to meet the necessary levels of sustainability.”

The installation was conducted by Kevin Marlow, Director of K Marlow Plumbing & Heating, who added: “The NUOS is a good looking product that’s very easy to fit. We put the first of the units in during the summer and, after just three hours, there was a full 250-litre cylinder of hot water available for use.”

“With a CoP of 3.7, the NUOS is capable of raising the water temperature to 55°C with just the heat pump (a back-up immersion is present to bring the temperature to 65°C) making it an ideal solution for off gas properties or as a replacement for existing electric only cylinders. It also features an intelligent control system which allows the end-user to program two separate times for hot water to be available.

“The NUOS is a good looking product that’s easy to fit.”

Kevin Marlow, K Marlow Plumbing & Heating

Furthermore, to guarantee safety and hygiene, the NUOS includes an anti-legionella function, which regularly heats the contents of the cylinder to 65°C in order to sterilise the stored water. The cylinder also has a five year guarantee and the electrical components are guaranteed for two years.
Four Ariston NUOS 250 heat pump water heaters have been installed inside the newly-built modular sports changing rooms at Waterside Playing Fields in Glasgow.

The floor-standing units were selected to enable the premises in meeting the Simplified Building Energy Model (SBEM) calculations, in accordance with Part L2 of the Building Regulations.

The installation, which was completed in October 2012, was undertaken by Bridlington-based heating engineers Tony Howarth Plumbing & Heating, which also built and co-designed the sports changing rooms with Ideal Building Systems of Bridlington.

Tony Howarth, Partner at Tony Howarth Plumbing & Heating, explained: “The new changing facilities required an energy efficient heating system in order to comply with the Building Regulations. It was great to discover that the NUOS from Ariston was capable of meeting the new venue’s hot water requirements. Once we had fitted the units inside a cupboard large enough to allow adequate air circulation, everything was in place in time for the new football season.”

“It was great to discover that the NUOS from Ariston was capable of meeting the new venue’s hot water requirements.”

Tony Howarth, Tony Howarth Plg & Htg

With a CoP of 3.7 @ 20ºC (EN 255-3), the NUOS is capable of raising the water temperature to 55ºC with just the heat pump (a back-up immersion is present to bring the temperature to 65ºC) making it an ideal solution for off gas properties or as a replacement for existing electric only cylinders. It also features an intelligent control system which allows the end-user to program two separate times for hot water to be available. The heat pump water heater was also recognised for its efficiency in the 2012 edition of Construction Products Innovation and Achievement (CPIA).

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Barnsley-based renewables installer Just Renewables Ltd is practising what it preaches, having recently installed a fully operational Ariston NUOS floor standing unvented cylinder with integrated air source heat pump water heater at its Wakefield Road showroom. The NUOS has been fitted to the heating system along with two Ariston solar thermal panels, while a monitoring device simultaneously records how much energy is being saved. The fully functional display is available for heating installers to study and interact with, enabling them to learn more about the technology involved.

The installation was the result of a meeting between Glyn Burns, Managing Director of Just Renewables Ltd, and Ariston at the Ecobuild 2012 exhibition. Having been impressed by the renewable technologies available, Glyn opted to have an Ariston system installed at his company’s trade showroom in South Yorkshire, as well as offer the products to his customers.

“We’d consulted other manufacturers but the Ariston unit was the best all-round product available on the market.”

Glyn Burns, Just Renewables Limited

Glyn explains further: “We were looking for a small, compact product that was easy to fit indoors as part of a fully operational renewable heating system. However, there are not many units available that combine tanks and heat pumps together, so we were pleased to learn about the NUOS from Ariston. We’d consulted other manufacturers but the Ariston unit was the best all-round product available on the market. We certainly didn’t hesitate in adding “the system to the renewable technologies we offer our installers.”

The whole system was installed inside two days, and Glyn was so impressed he decided he would have a NUOS installed at his home as well. This was not a difficult decision to make, as he enthuses: “The NUOS offers massive cost savings in comparison to electric immersion heaters or traditional gas boiler systems, as well as much higher levels of energy efficiency. Indeed, the statistics from the energy monitoring unit on the system in the showroom have been so impressive they’ve convinced me to get a NUOS installed in my house as well.”

“Statistics from the energy monitoring unit on the system in the showroom have been so impressive they’ve convinced me to get a NUOS installed in my house as well.”

Glyn Burns, Just Renewables Limited
FLOOR STANDING DIRECT AIR SOURCE HEAT PUMP WATER HEATER

- COP 3.7 @ 20ºC (EN 255-3)
- COP 3.1 @ 7ºC (EN 255-3)
- COP 2.6 (EN 16147)
- ALL PLUMBING AND ELECTRICAL CONNECTIONS WITHIN A 45° ANGLE
- ENVIRONMENTALLY SOUND AND HIGHLY EFFICIENT THERMAL INSULATION
- 3 MAGNESIUM ANODES TO PROTECT AGAINST CORROSION
- FACTORY FITTED 1/2" T&P RELIEF VALVE
- BACK-UP HEATING ELEMENT (1 + 1.5kW)
- 750W COMPRESSOR (HEAT PUMP)
- ’PLUG AND PLAY’ - NO F-GAS QUALIFICATIONS NEEDED TO INSTALL
- 5 YEAR TANK GUARANTEE (2 YEAR GUARANTEE ON ELECTRICAL COMPONENTS)

Dimensions

- DHW Out
- Condensate Drain
- Cold Feed

**Dimensions**

- 1478
- 1700
- 568
- 344
- 504
- 30
- 45°
### Technical Data

**NUOS 200d**

**DESCRIPTION**
- Tank Rated Capacity: litres 200
- Footprint (minimum): mm 600 x 600
- Weight Empty: kg 90
- Weight Full: kg 290
- Minimum Ceiling Height: metres 1.75

**CYLINDER**
- Normal Operating Pressure: bar 3.5
- Maximum Water Supply Pressure: bar 12
- Hot/Cold Water Connection: \(3/4\)” BSP - 22mm
- Heat Loss (@ 65ºC): kWh in 24hr 2.06
- Global Warming Potential (GWP): <5
- Ozone Depletion Potential (ODP): 0

**HEAT PUMP**
- Heat Rating*: kW 2.775
- Power Consumption*: kW 0.75
- CoP in accordance with EN 255-3 (air temp. 20ºC): 3.7
- CoP in accordance with EN 16147: 2.6
- Heating Time [AT 45ºC*]: mins 236
- Heating Energy Consumed*: kWh 2.2
- Maximum Water Temp (Heat Pump Only): ºC 55

**REFRIGERANT FLUID**
- Type of Fluid: R134a
- Quantity: kg 1.28
- Practical Limit for Room Volume**: m³ 5.12

**ELECTRICAL DATA**
- Electrical supply: V/Hz 220-240/50
- Element Rating: kW 1.5 + 1
- Protection grade of electrical system: IP X4

**AIR**
- Air Flow Rate: m³/h 300 - 500
- Available Static Pressure Loss: Pa 70
- Sound Pressure Level @ 2m: dB(A) 39
- Min. Temp of Room of Installation: ºC 1
- Max. Temp of Room of Installation: ºC 35
- Min. Volume of Room (non-ducted): m³ 20
- Min. Air Temp Required (w.b.) @ 90% r.h.: ºC -5
- Max. Air Temp Required (w.b.) @ 90% r.h.: ºC 35

**REHEAT TIME**
- 100% Capacity (Heat Pump Only): mins 236
- 70% Capacity (Heat Pump Only): mins 181
- 100% Capacity (Heat Pump & Element): mins 140
- 70% Capacity (Heat Pump & Element): mins 114

**Model**
- NUOS FS 200
- Unvented Kit
- Duct Kit (Inlet/Outlet) - Ø150mm / Ø200mm
- 90º Elbow - Ø150mm / Ø200mm
- Wall Fixing brackets (2) - Ø150mm / Ø200mm

**Accessories**

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* Tested in accordance with EN 16147
** The practical limit is the minimum room volume the appliance should be installed in, the volume is based on quantity of refrigerant in the system. In the event of a sudden release of refrigerant then the min. room volume will make it safer for the engineer.
NUOS

FLOOR STANDING INDIRECT AIR SOURCE HEAT PUMP WATER HEATER

- COP 3.7 @ 20ºC (EN 255-3)
- COP 3.1 @ 7ºC (EN 255-3)
- COP 2.8 (EN 16147)
- ALL PLUMBING AND ELECTRICAL CONNECTIONS WITHIN A 45º ANGLE
- ENVIRONMENTALLY SOUND AND HIGHLY EFFICIENT THERMAL INSULATION
- 3 MAGNESIUM ANODES TO PROTECT AGAINST CORROSION
- FACTORY FITTED 1/2" T&P RELIEF VALVE
- BACK-UP HEATING ELEMENT (1 + 1.5kW)
- 750W COMPRESSOR (HEAT PUMP)
- INDIRECT COIL FOR USE WITH SOLAR SYSTEMS OR GAS/OIL BOILER
- 'PLUG AND PLAY' - NO F-GAS QUALIFICATIONS NEEDED TO INSTALL
- 5 YEAR TANK GUARANTEE (2 YEAR GUARANTEE ON ELECTRICAL COMPONENTS)

Dimensions

- ENAMELLED STEEL TANK
- ENERGY SAVING
- ENVIRONMENTALLY FRIENDLY INSULATION

5 year guarantee
## Technical Data

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<th>DESCRIPTION</th>
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<td>Tank Rated Capacity litres</td>
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<td>Footprint (minimum) mm</td>
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<td>Weight Empty kg</td>
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<td>Weight Full kg</td>
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<td>Minimum Ceiling Height metres</td>
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### CYLINDER
- Normal Operating Pressure bar: 3.5
- Maximum Water Supply Pressure bar: 12
- Heat Loss (Ø 65ºC) kW/h in 24hr: 2.05
- Global Warming Potential (GWP): <5
- Ozone Depletion Potential (ODP): 0

### HEAT PUMP
- Heat Rating kW: 2.775
- Power Consumption kW: 0.75
- CoP in accordance with EN 255-3 (air temp. 20ºC): 3.7
- CoP in accordance with EN 16147: 2.8
- Heating Time (ΔT 45ºC)*: 302 mins
- Heating Energy Consumed* kW/h: 2.7
- Maximum Water Temp (Heat Pump Only) ºC: 55

### REFRIGERANT FLUID
- Type of Fluid: R134a
- Quantity kg: 1.28
- Practical Limit for Room Volume** m³: 5.12

### ELECTRICAL DATA
- Electrical supply V/Hz: 220-240/50
- Element Rating kW: 1.5 + 1
- Protection grade of electrical system: IP X4

### AIR
- Air Flow Rate m³/h: 300 - 500
- Available Static Pressure Loss Pa: 70
- Sound Pressure Level (Ø 2m) dB(A): 39
- Min. Temp of Room of Installation ºC: 1
- Max. Temp of Room of Installation ºC: 35
- Min. Volume of Room (non-ducted) m³: 20
- Min. Air Temp Required (w.b.) Ø 90% r.h. ºC: -5
- Max. Air Temp Required (w.b.) Ø 90% r.h. ºC: 35

### REHEAT TIME
- 100% Capacity (Heat Pump Only - ΔT 45ºC) mins: 302
- 70% Capacity (Heat Pump Only - ΔT 45ºC) mins: 231
- 100% Capacity (Heat Pump & Element - ΔT 45ºC) mins: 194
- 70% Capacity (Heat Pump & Element - ΔT 45ºC) mins: 137

### Model
- NUOS FS 250i
- Unvented Kit 3208042
- Duct Kit (Inlet/Outlet) - Ø150mm / Ø200mm 3208061 / 3208071
- 90º Elbow - Ø150mm / Ø200mm 3208067 / 3208075
- Wall Fixing brackets (2) - Ø150mm / Ø200mm 3208068 / 3208077

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