

Energy Savings through the use of Heat Pumps



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AWHP - EU Current situation

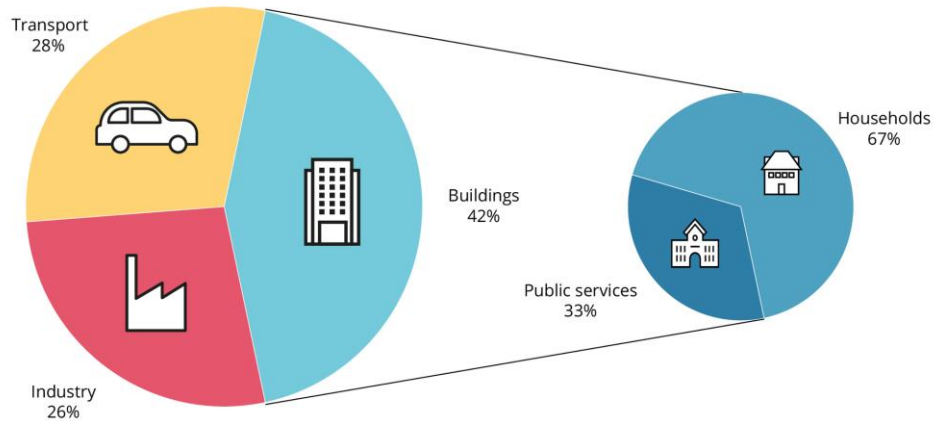


Figure 1. Final energy consumption by end-use sector, EU, 2020

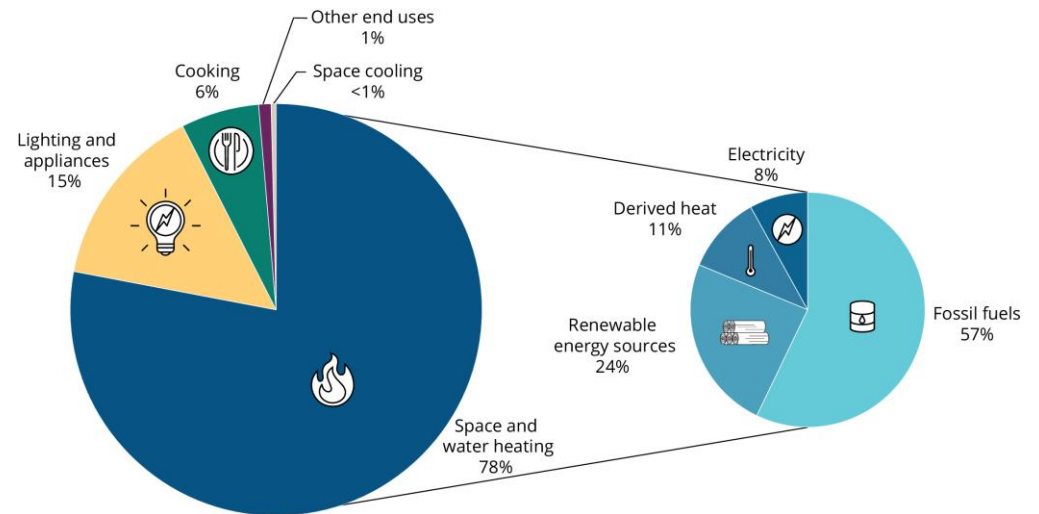


Figure 2. Final energy uses across EU households, with space and water heating disaggregated by fuel type, 2020

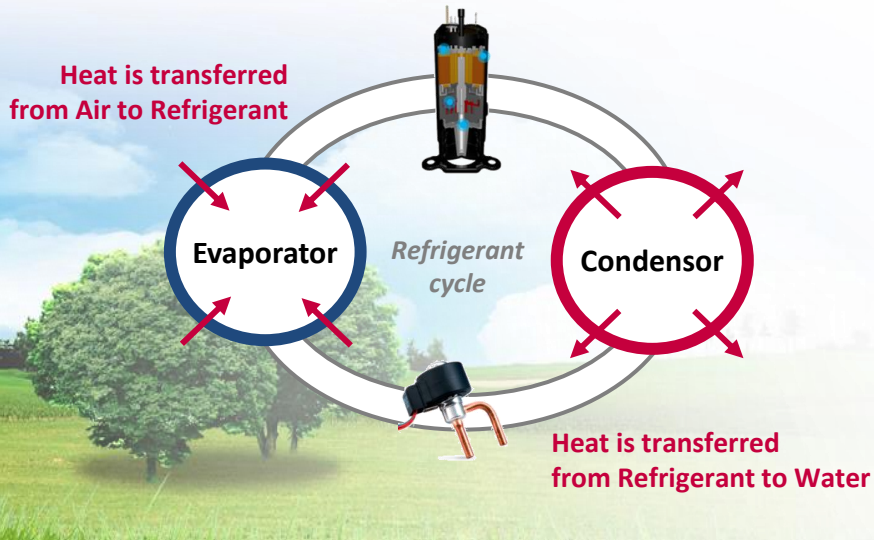
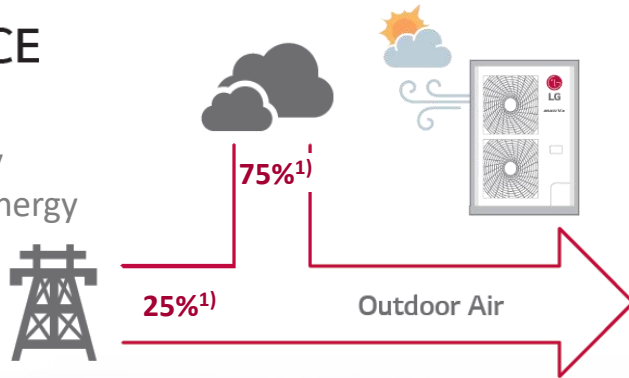
AWHP – Brief explanation

AWHP system can provide various heating solutions from floor heating to hot water supply with multiple heat sources. It is 4 times¹⁾ more energy efficient than the conventional system.

Air to Water Heat Pump

AIR SOURCE

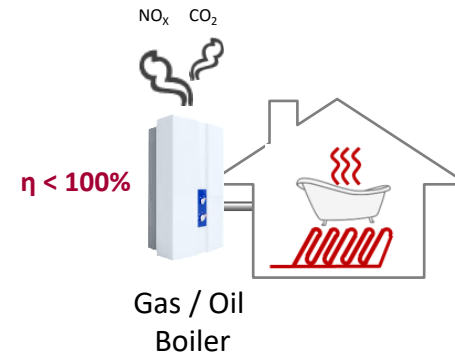
Free energy
Green energy
Renewable energy



Conventional System

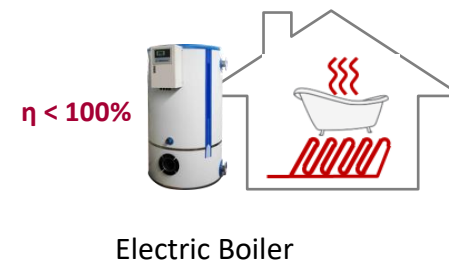
Gas / Oil Boiler

: Emissions of environmentally hazardous substances.



Electric Boiler

: High energy consumption



※ 1) Each ratio is general for helping understanding, and based on THERMA V R32 Series vs. Electrical Boiler under Low Temperature & Average Climate conditions. so, it may differ from actual operation.

AWHP - How to use

New approach and design for recent residential are required to create a comfortable living environment

- ***High-efficiency***
- ***Eco-conscious***
- ***Cost efficient investment***
- ***Low Noise***



Space Heating/Cooling

- Radiant
- Convection



Domestic Hot Water

- Shower & Washing
- Kitchen sink

AWHP - Types

Types

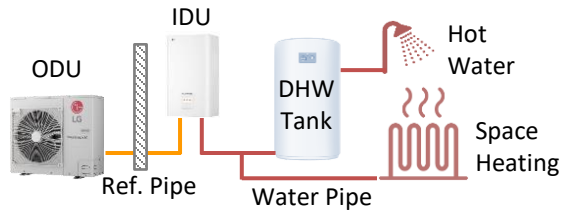
Scheme

Configuration

Remark

Split - Hydro box

R32
R290

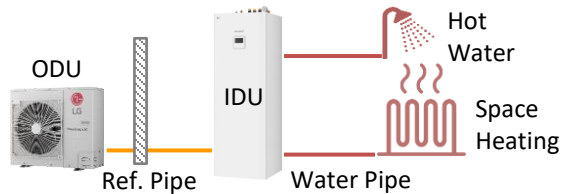


- Basic : ODU + IDU
- Additional DHW Tank

- No water freezing
- Risk of refrigerant leakage inside
- Certified person for refrigerant

Split - IWT

R32

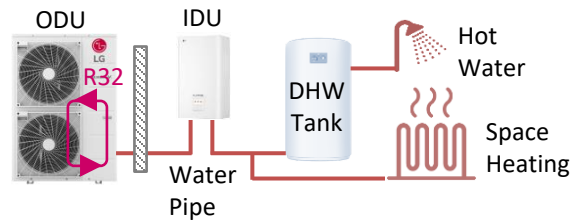


- Basic : ODU + IWT
(DHW Tank included)

- No water freezing
- Saving Indoor Space
- Risk of refrigerant leakage inside
- Certified person for refrigerant

Hydrosplit - Hydro box

R32

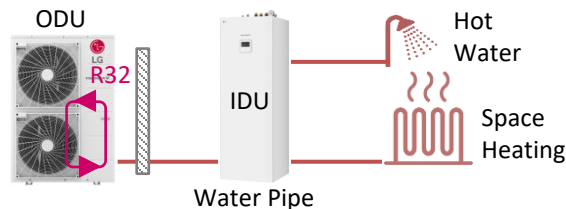


- Basic : ODU + IDU
- Additional DHW Tank

- Risk of water freezing
- No refrigerant pipes
(No leakage inside & No cert.)
- Hydronic components located inside

Hydrosplit - IWT

R32

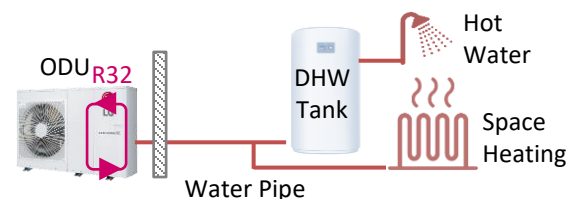


- Basic : ODU + IWT
(DHW Tank included)

- Risk of water freezing
- No refrigerant pipes
(No leakage inside & No cert.)
- Saving Indoor Space
- Hydronic components located inside

Monobloc

R32
R290

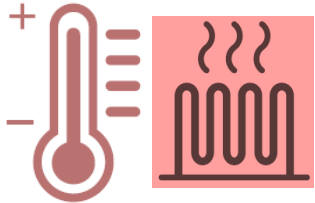


- Basic : ODU
- Additional DHW Tank

- Risk of water freezing
- No refrigerant pipes
(No leakage inside & No cert.)
- Saving Indoor Space
- Indoor PCB located outside
- Hydronic components located outside

AWHP - Compatible with Various Terminal Units.

As required water temperatures are different as per terminal units, It is important to select suitable model providing the water temperature required by the terminal unit. Therma V has a wide leaving water temperature range, so it is compatible with various terminal units.



AWHP Products are providing

Cool water outlet temperature is 5~27°C (R32, R410A)

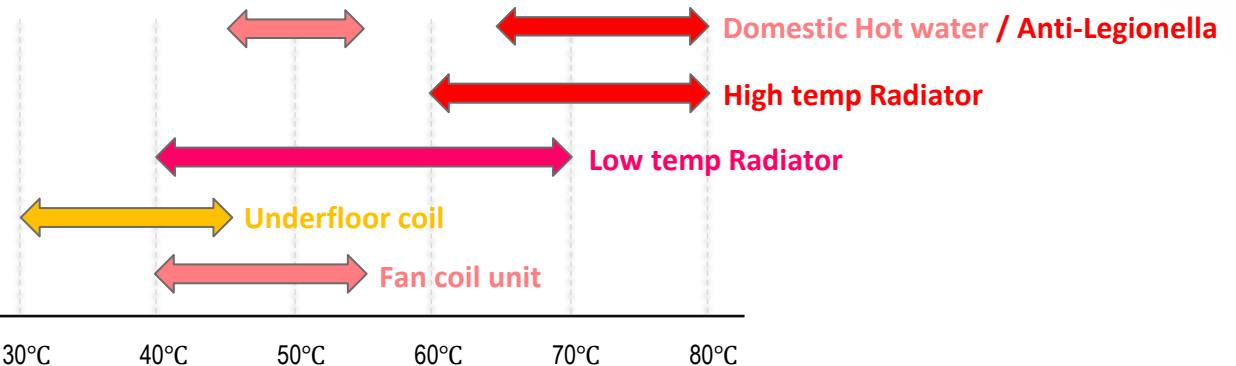
Hot water outlet temperature is 15~65°C (R32)

Hot water outlet temperature is 15~57°C (R410A)

AWHP High Temp. is providing

Hot water outlet temperature is 25~80°C (R410A+R134a)

Purpose of use	Temperature range (°C)
Bath, shower	42~45
Wash-up, dish-washing	35~40
Kitchen	45~45
Swimming pool	25~28 (winter season 30)



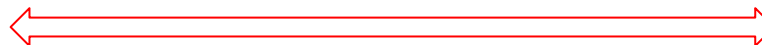
R410A Series



R32 Series



High Temp.



AWHP – EcoDesign/Efficiency

Ecodesign directive sets the minimum mandatory requirements for the energy efficiency of HVAC Products, AWHP included

Lot 1	air to water heat pump	Etas (35°C) 125%	<=6kW, 60dB for indoors, 65dB for outdoors >6kW and <= 12kW, 65dB for indoors and 70dB for outdoors >12kW and <=30kW, 70dB for indoors and 78dB for outdoors >30kW and <=70kW, 80dB for indoors and 88dB for outdoors	A+++ to D
		Etas (55°C) 110%		

The seasonal space heating energy efficiency (η_s) is defined as follows:

$$\eta_s = \frac{SCOP}{2.5} - i$$

with

SCOP according to EN 14825

$F(1)$ = negative contribution of temperature controls

(3% for electrically driven heat pumps)

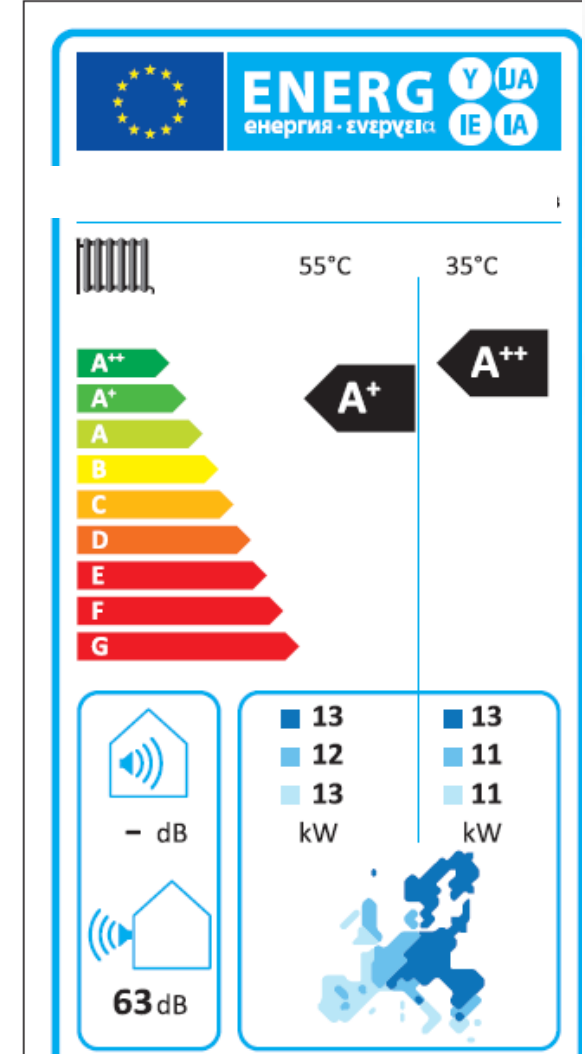
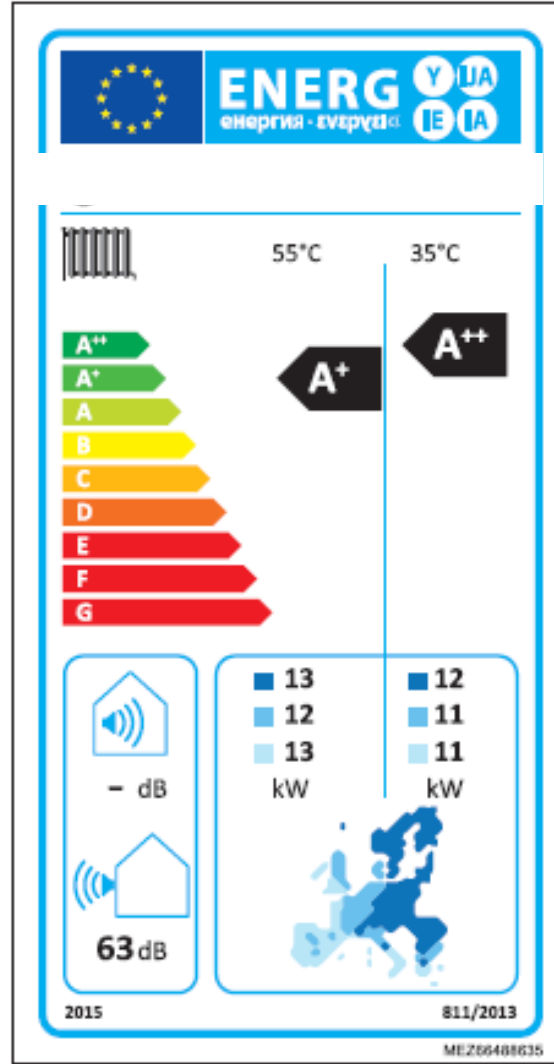
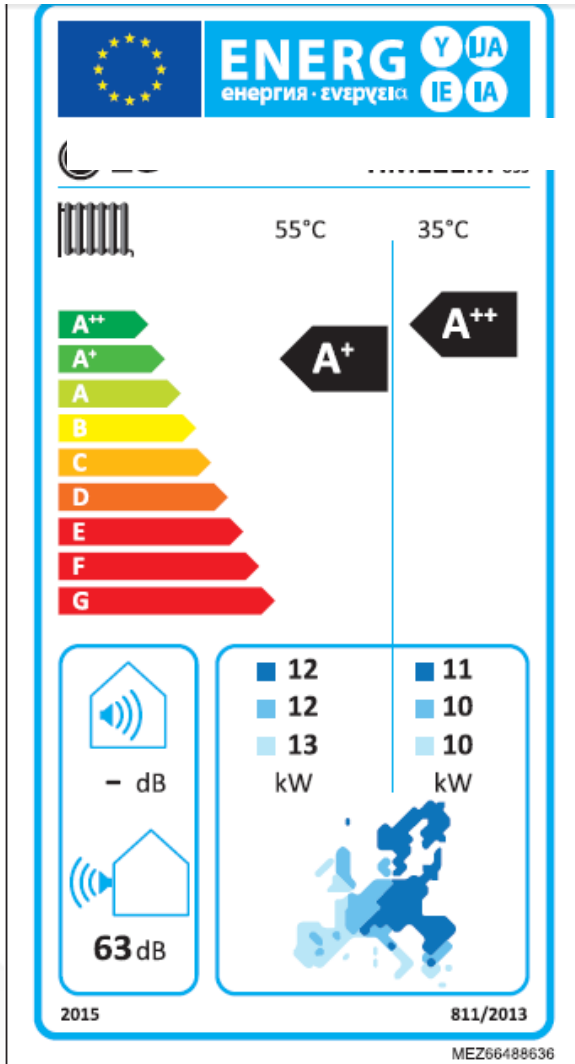
* Subject to change due to higher rate of renewables in electrical current mix

AWHP - Data sheet

Together with the product, each manufacturer has to provide a datasheet in defined format showing the key data („ErP Product fiche“).

¹ Product Fiche				
² Supplier's name :				
³ Model Name :				
⁴ Seasonal space heating energy efficiency class : A++ (35°C) / A+ (55°C)				
		⁵ Colder	Average	Warmer
		35°C / 55°C	35°C / 55°C	35°C / 55°C
⁶ Rated heat output :		13 / 12	10 / 10	12 / 10 kW
⁷ Seasonal space heating energy efficiency :		130 / 111	173 / 122	225 / 151 %
⁸ Annual energy consumption :		9633 / 10071	4651 / 6564	2800 / 3599 kWh
⁹ Sound power level (LWA) :	IDU	48 dB		
	ODU	68 dB		
¹⁰ Water pump EEI ≤		0.23		
¹¹ Temperature control	Class	V		
	Contribution (%)	3		
¹² PRECAUTION				
¹³ Contact the authorized service technician for repair or maintenance of this unit.				
¹⁴ • Contact the installer for installation of this unit.				
¹⁵ • AWHP is not intended for use by young children or invalids without supervision.				
¹⁶ • Young children should be supervised to ensure that they do not play with AWHP.				
¹⁷ • When the power cable is to be replaced, replacement work shall be performed by authorized personnel only using only genuine replacement parts.				
¹⁸ • Installation work must be performed in accordance with the National Electric Code by qualified and authorized personnel only.				

AWHP – Energy Label



AWHP - Advantages

Apart from low operating costs, the main advantages of heat pumps are:

- Low maintenance costs.
- Eligible for the "Exoikonomo" program
- Combined operation of heating, cooling and domestic hot water
- Minimizing required boiler room space, avoiding chimneys, tanks, etc.
- Easy and quick installation in existing homes.

AWHP - Points to consider

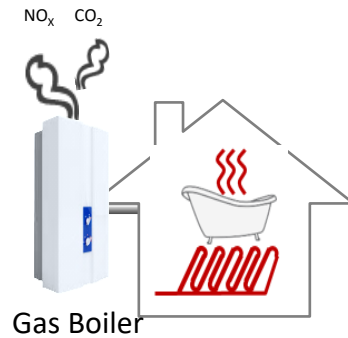
- The design should always be done by an engineer, whether it is an old or a new heating installation.
- Sizing the heat pump must be done with care. A large pump means reduced performance and rapid wear.
- Installation and commission should be done by authorized technician/engineer.

AWHP – Energy Saving Case Study

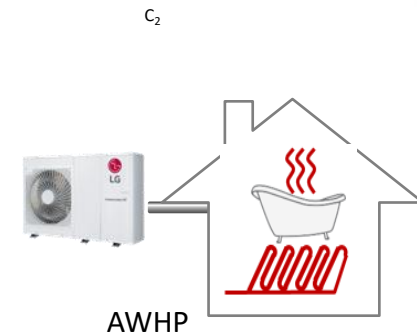
Data

- ❑ 100 sqm Athens Centre apartment.
- ❑ Construction date : 2005

Oil Boiler – Operating Cost 2150 Eur



AWHP– Operating Cost 1000 Eur



** Based on average 2023 prices*

Questions?