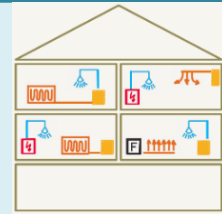


CasaVerdeNoce, Italy

Comfort and sustainability align

Individual Clivet heat pump systems for the Class A3/A4 building in Milan where management costs had to be kept to a minimum



F4.1

Key facts

Buildings

Location	Milan, Italy
Construction	2020
Heat distribution	underfloor heating
Heated space	21 apartments of different sizes
Level of insulation	very good

Heat pump and source

Number of	21
Operation mode	Monoenergetic
Heat source	air

Heating system

Heat demand	120 kW
Heating temperature	35°C

Domestic hot water

Type of system	individual
Max. temperature	55 °C

Other information

Coefficient of Performance	5
Refrigerant	R410A

Lessons learned

- Specialised heat pump Systems allows to use this technology in all comfort functions, from space heating and cooling to ventilation and energy recovery
- Small flats can benefit from innovative solutions such as the multi-function packaged air-to-air heat pump. Complete with DHW production, it fits in both architectural and historical buildings, as it does not need any outdoor unit
- **Member 4.1** “Individual solution for each apartment



The intention expressed by the builder was to build an environmentally sustainable building, which would use eco-sustainable and easily recyclable materials, positioning it at the first levels of the energy classification of the Lombardy Region and guaranteeing high living comfort.

It takes careful planning to come up with a truly environmentally sustainable building. The aim with the CasaVerdeNoce building in Milan was to use sustainable and easily recyclable materials. The idea was to guarantee efficiency, low environmental impact, and high living comfort but low management.

While the municipality of Milan prescribes central solutions in multi-family buildings, here an independent solution per apartment was chosen, to provide heating, cooling, and domestic hot water production at higher energy efficiency. Furthermore, all apartments have photovoltaic electricity.

As a result, CasaVerdeNoce has zero local CO₂ emissions and an energy class of A3 /A4, on top of the local energy saving scale.

CasaVerdeNoce, Italy



1) Large apartments:

ELFOFresh thermodynamic ventilation unit, complete with electronic air purification, humidity control and active energy recovery

SPHERA Invisible, split-type high efficiency inverter heat pump for heating, cooling and domestic hot water.

2) Low size apartments:

ELFOPack, the compact unit that provides space heating and cooling, ventilation with energy recovery, air purification, domestic hot water with storage tank. All in a package without any outdoor unit.

Description of the technical concept

In terms of heating and cooling, all larger apartments are equipped with a full inverter air-to-water heat pump, split-type with recessed indoor unit. This provides heating and cooling to the underfloor system, with additional domestic hot water.

The ventilation system for air renewal and purification, humidity control and thermodynamic energy recovery eliminates more than 95% of fumes, dust, viruses, bacteria and polluting particles.

Smaller flats each have a compact multi-functional air-to-air heat pump providing heating, cooling and domestic hot water, as well as renewing and purifying the air. The units use mechanical ventilation ducts for heating and air conditioning, to simplify the system. Electronic filters purify the outside air with an efficiency greater than 99.9%. Active thermodynamic recovery saves and amplifies the energy contained in the exhaust air. No outdoor units are needed.

The system can be managed remotely to customize the settings.

The Results:

The use of renewable energy sources such as the heat pump combined with photovoltaic and high thermal insulation coupled with the efficiency of the technological systems, has made it possible to reduce the environmental impact.

CasaVerdeNoce is a building with zero local CO₂ emissions with an A3/A4 energy class, which places it at the top of the classification of the energy efficiency.

Each flat can independently manage indoor comfort through home automation systems. The air renewal and purification system with electronic filters and active thermodynamic recovery ensures air quality, saving energy.

