

Claude-Tournier residence, Brie-Comte-Robert, France

Renovation of 205 social housing units in 13 buildings, with small collective hot water heat pumps installed in each building

Key facts

Building

Location	Brie-Comte-Robert, France
Construction	1970/2014
Heat distribution in building	
Heated area	14,000 m ² living
Level of insulation	

Heat pump and source

Number of heat pumps	13
Installed capacity	13 x 18 kW
Operation mode	monoenergetic
Heat source	air source
Brand and type:	Atlantic Hydrapac 2
Refrigerant	R410A
Sound level	48 dB

Heating system

Heat demand	electric panels
Heating temperature	35°C

Domestic hot water

Type of system	collective
Max. Temperature	58°C
Circulation system	
Legionella measures	details on 2 nd page
Storage size	2 x 1000 litres in each substation
Number of storage tanks -	26
Storage losses	unknown
Temperature control -	details on 2 nd page

Other information

Electric energy	unknown
Consumption year	kWh
Investments costs	6,5M€
PV installation	
Solar thermal	

Lessons learned

At the start of 2012, before the start of the works, the tenants were interviewed by EFIDIS to find out their satisfaction with their accommodation, their residence and their neighbourhood and to identify the points of dissatisfaction in order to refine the work program.



The Claude Tournier residence dates from the 1970s with 205 social housing units in 13 buildings and a medical and psychological centre located at the southern entrance to Brie-Comte-Robert were extensively renovated by EFIDIS, the social landlord. The investment of 6.6M€ – (or 32,400 € – per accommodation) focused on refurbishing all the apartments of 600 tenants, redeveloping outdoor spaces and reduction of the overall energy consumption. The residences border a large park with trees and is close to a nursery school, two elementary schools and a sports centre.

The renovation meets a double objective: modernize the equipment of housing and buildings for the comfort of residents and, on the other hand, secure and beautify the exterior spaces of the residence for a better living environment. They have given the residence another physiognomy thanks to the work carried out on the facades. Finally, they respond point by point to the reasons for dissatisfaction expressed by the tenants interviewed by EFIDIS in February 2012 before the start of work. The rehabilitation was delivered in September 2014.

The work undertaken has made the residence more respectful of its environment and more energy efficient. After the works, the residence went to category D with an energy expenditure estimated at 190kWh/m²/year. The installation of different equipment: mixer taps, double buttons that save water consumption, automatic lighting with presence detector, etc., reduces energy consumption. In addition, the exterior insulation of the façades and the replacement of the entrance doors contribute to reductions in energy consumption.

Claude-Tournier residence, Brie-Comte-Robert, France Technical details



Substation with heat pump and two storage tanks 2 CORFLEX 1000L.



Room by room programming

Formerly equipped with bi-junction heating that is hardly adapted to current comfort and load control requirements, the apartments in the residence now have heat-transfer electric heaters. These have the double originality on the one hand, of diffusing the heat on the whole of their surfaces what allows a more intense efficiency of the heating of the room. On the other hand, they are equipped with timers that allow the heating to be adjusted room by room and according to desired time periods. EFIDIS participated alongside the manufacturer Néomitis in the design of an interactive user guide for this new equipment, available via the [manufacturer's website](#).



Description of the technical concept

Domestic hot water is centrally for each building substation produced by an Atlantic HYDRAPAC 2 thermodynamic domestic hot water system. The system consists of an air - water, split, high temperature, high performance heat pump, with a capacity of 16 kW. An indoor unit, integrated into a hydraulic station and composed of a coaxial exchanger in a buffer volume, will transmit energy from the primary circuit to a brazed plate exchanger in order to heat the secondary circuit, the domestic water. The two exchangers are installed in series to meet regulatory requirements. The indoor unit is equipped with an electrical resistance in the middle of the coaxial exchanger to provide the additional energy needed for extreme atmospheric conditions, or as backup if the heat pump is out of service.

The heat pump has DC Inverter technology, split, with liquid phase injection in the two-stage scroll compressor with very high energy efficiency. The compressor limits the overcurrents at start-up and allow the modulation of the heat output. The controls continuously modulate the power according to the quantities of water drawn.

For an outlet temperature of domestic water at +35 ° C and air at + 7 ° C, the COP will is - 4.30 for an 11B25 model. Performance is certified by HP Keymark.

Two storage 1000 litre tanks, connected in series, will ensure the storage of hot water. An emergency electrical resistance positioned in the upper part of the hottest tank will meet exceptional hot water consumption with possible operation at any time. The domestic hot water production system can operate continuously, in order to maintain the set temperature in the storage volume.

The maximum water temperature is adjustable by the customer. In permanent mode, the setpoint is set by default to 58°C in the hot tank, temperature necessary to ensure a departure at 55°C minimum. The flow temperature setpoint is adjustable up to 60°C, however maintaining a setpoint at 55°C is recommended in order not to reduce the performance of the system.

The control of the system includes an anti-legionella cycle, the frequency of which is configurable. This anti legionella cycle only concerns the production / storage part. The customer may, at his own expense and manually, while respecting the safety instructions and if the hydraulic installation allows it (presence of bypass, mixers, etc.), irrigate the distribution loop with hot water to ensure complete decontamination of the sanitary water network.