



## Fresnes – Superior efficiency of a geothermal system with a Unitop 33

### Client

Sofrege / Coriance  
FR-93885 Noisy-le-Grand Cedex / France

### Plant location

Sofrege  
FR-94260 Fresnes / France

### Geothermal energy

Geothermal energy has been supplying heat to district networks in the Paris area since the 1970s. Its origin is a geological basin of sedimentary rocks called "Dogger", a large aquifer whose bottom lies at a depth of 1500 to 2000 meters below the city.

The technique of exploiting geothermal energy is to get to the natural hot water and make it available on the surface. It is on this principle that the geothermal doublet (two sets of wells, a supply to draw water and a reinjection) operates. Hot water rises to the surface and heats the district heating network by means of heat exchangers. Afterwards it is injected to the Dogger again in a closed loop.

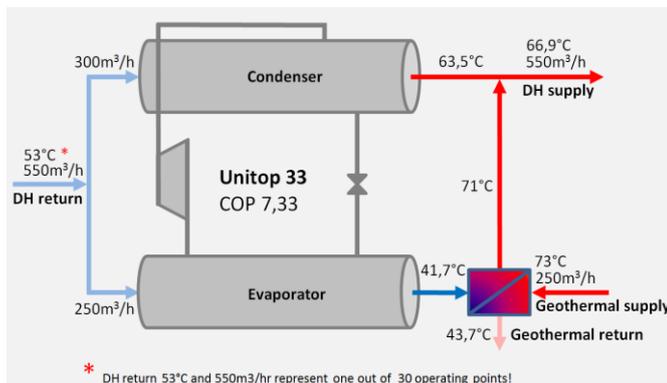
### Geothermal energy at Fresnes

The exploitation of geothermal energy at Fresnes commenced in 1986. The geothermal plant included a doublet of boreholes to a depth of 1800 meters, offering a temperature of 73°C. To meet the ever growing demand, the plant was constantly enlarged over the years. At present, the geothermal system provides heating and hot water to more than 7'000 housing equivalents in Fresnes. A third set of boreholes was commissioned in 2014 together with the heat pump. This will allow further expansion of the district heating network. The aim is to increase the amount of heat produced, to ensure 60% of Fresnes's needs by 2020.

### 1 Unitop 33 C heat pump from Friothersm

The Unitop 33C unit operating at Fresnes is a very versatile industrial heat pump incorporating a heavy duty centrifugal compressor. With its special design to meet the requirements of

the geothermal system at Fresnes, it was completely factory mounted in the Friothersm works. The control system and the operating modes are specially adapted to comply with the client requirements regarding flexibility of operation modes, high efficiency and operational reliability. Built for decades of operational life, the service friendly design allows limiting service and maintenance work to a minimum.



### Main technical data (for DH return temp. 53°C)

Operating Seasons:	Autumn-winter-spring
Heating capacity:	2'120 kW - 3'610 kW
Cooling Capacity:	1'900 kW - 3'250 kW
Hot water in/out:	53 °C / 63,5 °C - 71,5 °C
Cold water in/out:	53 °C / 41,7 °C - 46,4 °C
COP (heating):	7,33 - 5,77

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