

## Jannes van der Sleedenhuis, Hoozeveen, Netherlands

Newly built care home with a high temperature gas engine heat pump for domestic hot water and space heating.

### Key facts

#### Building

Location	Hoozeveen, Netherlands
Construction	2017
Heat distribution	collective
Heated area	m <sup>2</sup> living
Level of insulation	....

#### Heat pump and source

Number of heat pumps	1
Installed capacity	152 kW
Operation mode	monoenergetic
Heat source	water cellar/ground source
Brand and type	<a href="#">Reduses</a>
Refrigerant	R134a
Sound level	65 dB

#### Heating system

Heat demand	
Heating temperature	45°C
Heating system	LT Floor heating

#### Domestic hot water

Type of system	HT	4-pipe	Circulation
system with substations			
Max. Temperature	70°C		
Legionella measures	Thermal		
Storage size	litres		
Number of storage tanks			
Storage losses			
Temperature control			

#### Other information

Electric energy	
Consumption year	kWh
Investments costs	unknown

#### Lessons learned

[Lessons learned and way forward after 20 gasengine heat pump projects](#)



The housing company Woonconcept owns various care complexes in the area and recently completed the Jannes van der Sleedenhuis in Hoozeveen. An example of small-scale care, with 30 rental apartments and 7 care departments for several residents. Four wings converge in a central atrium, the meeting point of the building. In addition to the heat demand, the tenant of the residential care building, the umbrella care institution NNCZ, also had a cooling requirement and together with installers Van Dorp and Ten Kate, Energieconcept looked at a sustainable system. An electric heat pump is obvious in such a situation. Lower energy bills in winter and virtually free cooling in summer. It is a proven installation system that Energieconcept has had installed in various (care) buildings in recent years. But one thing doesn't go very well with an electric heat pump: DHW. The heat pump provides low-temperature heat that is ideal for underfloor heating, but DHW requires a second circulation network at high temperature for which gas boilers were installed.

Therefore it was decided to install gas engine driven heat pumps. Three gas engine-driven heat pumps were installed in new residential care complexes in Hoozeveen and Meppel in a short time. These are heat pumps from Reduses from Nijkerk. The Dutch company developed a heat pump, the compressor of which is driven by a gas engine, which actually is an ordinary VW car engine that runs on gas. A gas engine-driven heat pump system has an important advantage. With the direct heat from the engine the appliance delivers standard heated water at 70°C. A second high-temperature circulation network for hot water can be omitted. And so a circulation system based on 70/40 degrees was introduced in the Jannes van der Sleedenhuis. With this water temperature it is possible to prepare hot water at substation in the apartments.

A clean water cellar of the Waterleidingmaatschappij Drenthe acts as the source for the heat pump. In heating mode, the water stored in the clean water cellar is cooled to 1°C. The regional network operator Rendo owns the system and supplies the spring water with an average of 10-12°C in the technical room.

## Jannes van der Sleedenhuis, Hoogeveen, Netherlands, Technical details



Installation at the Jannes van der Sleedenhuis in Hoogeveen

In the other projects of Woonconcept a mono source is used as heat source. A mono source is an ATEs installation in a single source. The warm storage is positioned above the cold storage. Installed developed and patented a special mono source with an underground heat exchanger. The groundwater exchanges energy with the building water without rising above ground level. The major advantage of this is the pressure management of the groundwater. When the groundwater rises above ground level it must be kept under pressure, which entails additional costs and risks.



Reduses heat pump is delivered as a skid installed and tested at the factory to be able to install plug & play



### Description of the technical concept

The gas engine-driven heat pump from Reduses was developed at a request from the parent company Installlect. This installation consultancy ran into buildings with a relatively high heat demand against the limitation of an electric heat pump. An advantage of a gas fuelled heat pump is the lower load on the ground source system. Less heat is extracted from the source and this helps to maintain a balance in the aquifer. In residential buildings with a relatively large heat demand and small cooling demand the ground source for an electric heat pump quickly becomes unbalanced. That is usually solved with dry coolers or solar collectors. With the gas engine-driven heat pump this is not or much less necessary. Installlect's search for a gas-powered compressor was unsuccessful, so Reduses decided to develop it themselves.

The gas engine heat pump is also suitable for supplying high-temperature sanitary water in healthcare, such as nursing homes, hospitals, old people's homes, but also for hotels and applications with open tap water circulation sensitive to legionella. The portfolio of Reduses has more examples of these.

In a short time Woonconcept started using three gas engine heat pumps from Reduses. All three in healthcare institutions, including the Jannes van der Sleedenhuis in Hoogeveen. Two more are for the new Ezinge school complex in Meppel. Although Woonconcept has had good experiences with the gas engine heat pump, installers are still reluctant to use the technology. Because in addition to the heat pump, they have installed 6 HR gas boilers as backup, actually too many. The relatively low price of the gas boilers means that the installer opts for maximum security, because he does not want residents to get into trouble if the heat pump fails.

The capacity of the electricity grids is increasingly reaching the limit of their load capacity. While the existent gas network has sufficient capacity. When using a gas fuelled heat pump, less gas is needed than with a traditional installation. Installation of electric heat pumps will become more difficult, especially in inner-city areas and in existing buildings. In those cases, the application of a gas engine-driven heat pump is almost always possible, especially when additionally installing the mono-source ATEs system.,