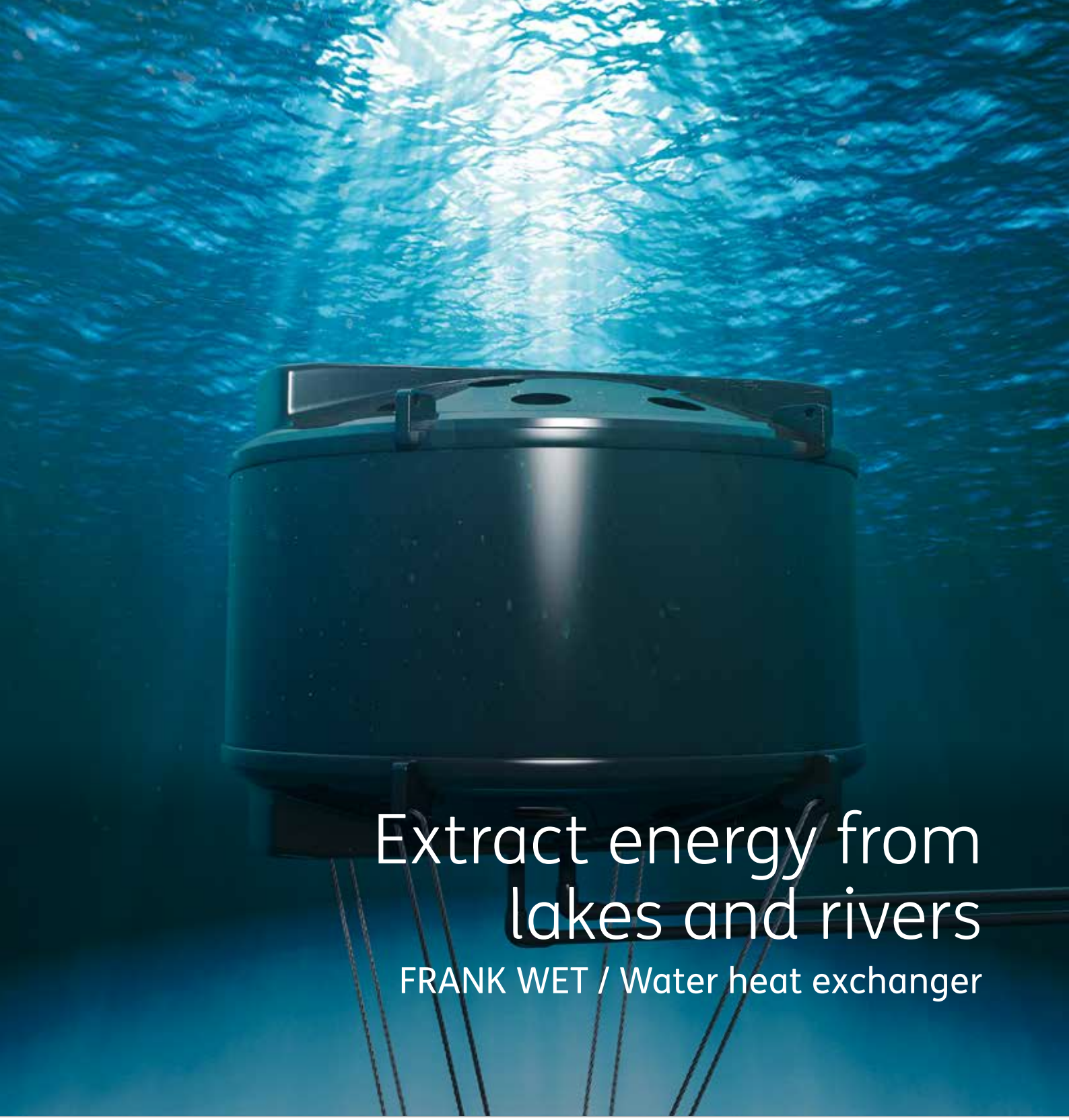


Extract energy from lakes and rivers

FRANK WET / Water heat exchanger

FRANK

Extract energy from lakes and rivers

FRANK WET / Water heat exchange

Our natural resources are limited. Already, humanity consumes more raw materials in one year than the Earth can replenish in the same period. Therefore, waste and environmental pollution should be avoided in all areas of life. This includes heating, for example. Instead of generating heat through fossil fuels, environmentally friendly alternatives can be used today. There is a huge potential in surface waters. In our lakes, rivers, and seas, there is an untapped source of energy: heat. The advantage is that this energy is renewable because it is constantly replenished by the sun. It is always available and free. It can be easily used for heating or cooling nearby buildings or houseboats. The environmentally friendly heat pump technology serves as the basis for this. It has been successfully used for many years and is extremely efficient.

To harness water as a new energy source, a FRANK WET water heat exchanger is required. This extracts heat from the water, which is then raised to the flow temperature of the heating system using the heat pump. This allows for effective heating through underfloor heating or standard radiators. Cooling of the rooms is also possible during the summer. For large installations with high energy demand, the system can be scaled as needed and expanded with additional FRANK WET water heat exchangers.

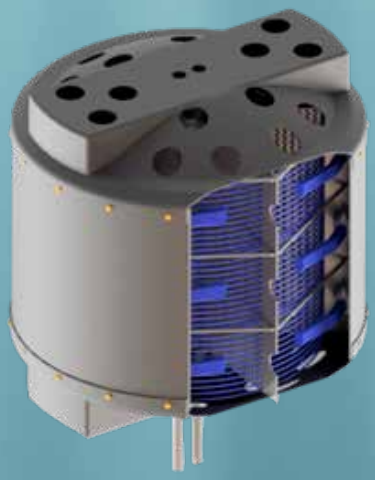
Whether for holiday homes, houseboats, residential parks, hotel facilities, or commercial buildings: Compared to conventional oil and gas heating systems, such a system has significantly lower CO2 emissions. If the pump is powered by renewable energy sources, the system is even completely climate-neutral.

Product Information

Description:
The FRANK WET water heat exchanger is specifically designed for heat extraction from surface waters. The compact, highly efficient heat exchanger extracts heat energy from the water and makes it available to a heat pump.
Similarly, the water heat exchanger can be used for cooling. The heat exchanger and the protective housing of the heat exchanger are made of environmentally friendly, high-quality polyethylene.

Operation:
The heat exchanger is operated in conjunction with heat pumps. Water/ethylene glycol is typically used as the heat transfer medium, with a glycol content of up to 35%.

Installation:
The installation can be carried out using anchoring weights on the waterbed, or alternatively by attaching it to jetties or quay walls. Refer to Figures 1 and 2.



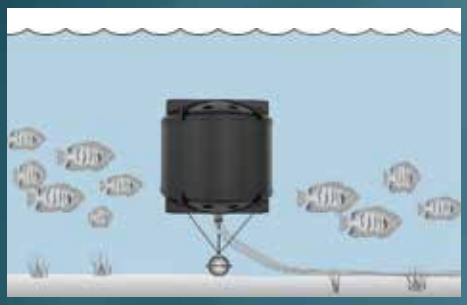


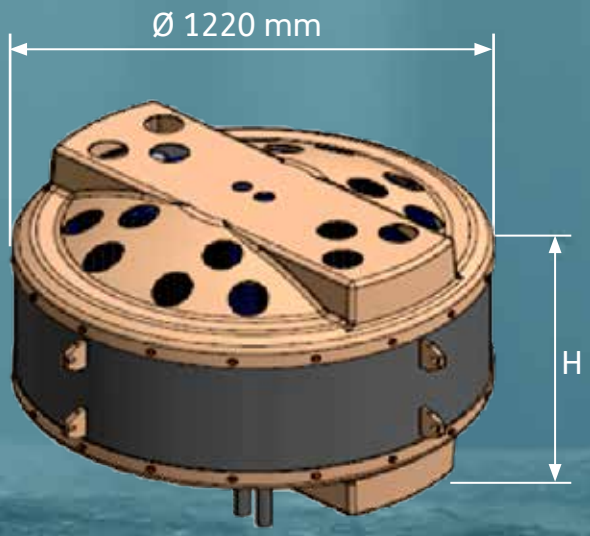
Figure 1: Attachment with anchoring weight.

Figure 2: Attachment by tensioning under boat dock.

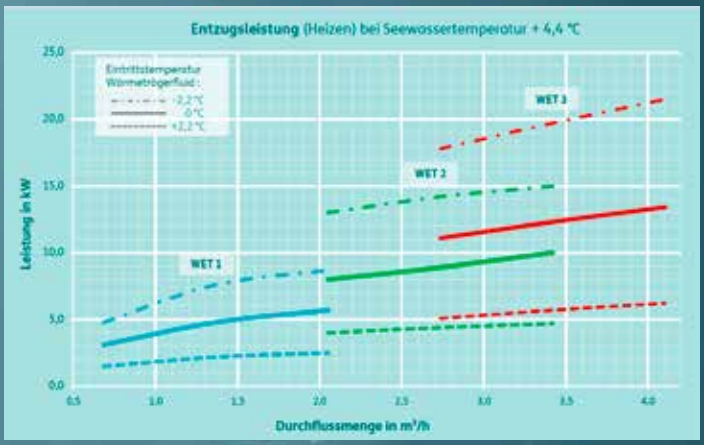
Features:
- Large heat exchanger surface
- Modular design with 3 module sizes
- All pipe connections welded
- Sturdy protective housing
- Secure connection through welded connection with electro-socket fitting

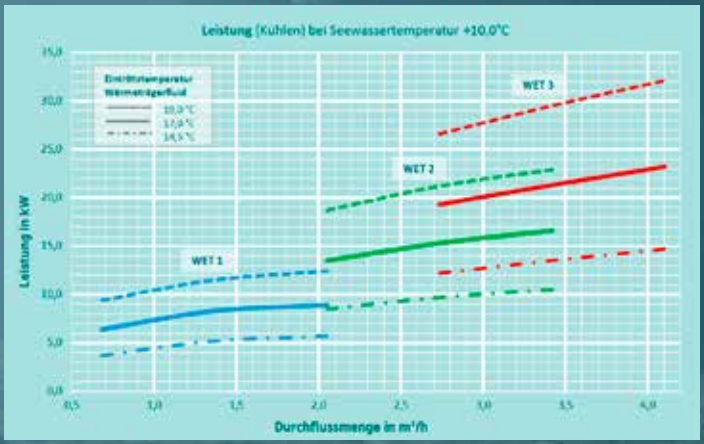
Technical data	
Max. operating pressure	3,0 bar
Max. testing pressure	4,5 bar (20°C)
Perm. ambient temperature	-10 °C bis +40 °C
Flow/ return connection	d 40 mm, SDR 11
Min. water depth (depending on module size)	2,60 bis 3,20 m

Module Type:	Overall height H
WET 1	600 mm
WET 2	900 mm
WET 3	1200 mm



Extraction Capacity (Heating / Cooling):
Due to the modular design in 3 sizes, it can be well adapted to the heat pump's power requirements. The extraction capacity depends on the module size, the surrounding water temperature, and operating conditions. For higher power requirements, multiple units can be connected in parallel via a distributor.





Property report

Project Loosdrecht, (NL)

The construction project is located directly on the Loosdrecht Lakes, which are connected to the Markermeer via the Vecht River, providing a link to Amsterdam, the Ijsselmeer, and the North Sea. Originally, the area was a marshland used for peat extraction. In the 20th century, it evolved into a recreational and residential area.

The challenge of the project was to utilize the heat energy stored in the water to provide heating and cooling for a single-family house with direct access to the lake. The building, constructed in 2010, boasts excellent insulation values, triple-glazed windows, underfloor heating, and low-temperature fan radiators. As part of this project, a heat pump was retrofitted.

For the efficient operation of the heating system, the new heat pump required a cooling capacity/environmental heat of approximately 7 kW at a flow rate of 2000 l/h. Due to the minimum temperature of the Loosdrecht Lake, around 4°C, and the local conditions, two FRANK WET water heat exchangers Type 1 were employed, each providing approximately 4 kW at a flow rate of 1000 l/h.

The installation of the heat pump and heat exchangers was carried out in two stages:

Step 1
The installation of the heat pump in the garage integrated with the residential house was carried out by the homeowner. Much of the existing piping from the old gas heating system was able to be reused.

Step 2
The FRANK water heat exchangers were fixed at approximately 2 meters depth in the lake using buoyancy safeguards. Additionally, complete piping was carried out, connecting the distributor and collector with the heat pump in the garage.

Further Details
The supply and return lines (d 40 SDR 11 PE 100-RC) of the two FRANK water heat exchangers were each approximately 50 meters long and were seamlessly connected to a plastic sole distributor Type 3060 in the garage.

The durable PE 100-RC pipes were easily laid in trenches approximately 0.5 meters deep and were led into the building through core drillings. During operation, a carrier medium (25% ethylene glycol-water mixture) circulates in the pipeline system between the heat exchangers and the water heat pump.

All connections within the system, from the heat exchangers to the heat pump, were realized using permanently tight welds. FRANK Ring-Gap-Seal were used for the subsequent sealing of the pipe penetrations in the masonry.

Lieferumfang FRANK:

- 2 St. FRANK WET Typ 1
- modularer Soleverteiler Typ 3060, 2 Kreise inkl. Isolationsschalen
- 200 m Anbindeleitung d40 mm
- 4 Schlag-Press-Dichtung d40/90
- div. Schweißformteile d40

Projectdata:

- Living Area: 150 m²
- Heat pump: ~ 9kW
  Manufacturer alpha innotec,
  Typ alterra WZSV-Serie 92K3M
- Project period: June - October 2022
- Installation period: 19th-21st October 2022
- Commissioning: 21st October 2022

Property report

Heating and cooling of the „Bassins de Lumières“ event centre in Bordeaux with WET water heat exchangers (F)

In June 2020, a gigantic centre for digital art opened in the former submarine base in Bordeaux.

Culturespace, the leading private operator in France in the management and enhancement of monuments, museums, and art centers, is further expanding its development in creating digital art and exhibition centers.

The nearly 20-meter-high bunker, a gigantic 42,000 square meter building on the banks of the Garonne, was built during World War II to house submarines. The bunker consists of eleven submarine docks, separated by thick concrete walls. An interior street connects the rooms, which are currently used for rotating exhibitions, concerts, and multimedia shows in an exceptional atmosphere. Visitors walk on walkways over the water and along the quays of the huge docks through the premises.

For heating and air conditioning of the building, a reversible air conditioning system was installed in the halls to balance heat losses in winter and heat gains in summer. The required heating and cooling capacity is generated by inverter-controlled heat pumps with a maximum output of around 250 kW. Additionally, hot water at a temperature of 40/45°C is provided for the heating system in the changing rooms. This energy is available for free in the water of one of the 100-meter-long, 22-meter-wide, and 12-meter-deep docks and continuously regenerates itself.

During the heating season, heat is extracted from the water, and during the cooling operation, heat energy is injected into the water.

For energy transfer, 9 FRANK WET water heat exchangers of Type 3 are installed in one of the docks. The consolidation and connection to the heat pump system are accomplished through a wall-mounted PE-100 sole distributor with shut-off valves.

Hydraulic balancing valves are installed in each circuit connection for the hydraulic balancing of the system.

The WET water heat exchangers were individually placed in the water and positioned at a depth of 5 meters using steel counterweights. The connecting lines up to the distributor are pre-insulated PE pipelines, which were connected using heating coil welding before the WET was submerged. The WET water heat exchangers are entirely made of polyethylene. All internal pipe connections are welded. As no metallic elements or screw connections were used in the underwater area, there is no risk of corrosion.

Cegelec Génie Climatique undertook the installation of the entire heating and cooling system for the project. A multi-zone direct evaporation system was installed to ensure that the 9 FRANK WET water heat exchangers do not cause any acoustic nuisance in the museum's exhibition areas. As a result, the majority of the required energy is free and renewable.

Scope of delivery

- 9 units of FRANK WET water heat exchanger Type 3
- 1 PE 100 brine manifold with 9 circuits, consisting of flow manifold with plastic ball valves and return manifold with balancing valves

Partner:

Planning: BETAFLUIDES, 33000 Bordeaux
Installation: Cegelec Génie Climatique, 33610 Cestas.

References

FRANK WET water heat exchanger

FRANK WET heat exchangers have already been used successfully in many projects in Europe and beyond and are an excellent choice for all buildings located next to bodies of water. Surface water is an excellent temperature reservoir and is therefore perfect for utilising this free energy to heat buildings. The Frank WET water heat exchanger is an efficient and environmentally friendly solution for large and small buildings as well as residential parks. We will be happy to support you with your next project and provide you with comprehensive advice on our products. Please contact us for further information or a non-binding offer.
Your FRANK team.

	2023 – Holiday home estate. 38 pc. FRANK WET type 3, 450kW, Neustadt-Glewe
	2022 – Detached house. 2 pc. FRANK WET type 1, Loosdrecht, Netherlands
	2019 – Exhibition/concert hall. 9 pc. FRANK WET type 3, Bordeaux, France
	2018 - Commercial premises & holiday flat. 6 pc. FRANK WET type 3, Hainer See, Germany
	2018 - Detached house. 1 pc. FRANK WET type 2, Ardennes, Belgium

	2018 - Residential building. 2 pc. WET Typ type 2, Ruppiner See, Germany
	2017 - Floating residential building. 4 pc. WET type 2, Woerden, Niederlande
	2017 - Residential house with approx. 400 m² + swimming pool. 6 pc. WET type 2, Wörthersee, Austria
	2016 - Residential house with approx. 200 m² living space. 1 pc. WET type 2, Lake Ossiach, Austria (nature reserve)
	2014 - Floating residential building with approx. 130 m² living space. 1 pc. WET type 2, Delft, Netherlands
	2013 - Floating holiday homes, living area approx. 95 m². 1 each WET type 2, Geierswalder See, Germany

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MITTELSTAND GLOBAL
ENERGY SOLUTIONS MADE IN GERMANY

Supported by:

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

Implemented by:

dena German Energy Agency

This product was installed at the Loosdrecht site in North Holland and uses a heat pump to sustainably heat a house with renewable environmental energy.
The RES Project Netherlands is supported by the German Federal Ministry for Economic Affairs and Climate Action as part of the Renewable Energy Solutions Programme of the German Energy Solutions Initiative.