

Plate Heat Exchangers



Power

Energy from Intelligence



Process Equipment Division
GEA PHE Systems

Concentrating on competence - for your benefit

Within the GEA Process Equipment Division of the international GEA Group, GEA PHE Systems is responsible for plate heat exchanger technology. Strong individual companies: GEA Ecoflex, GEA ViEX, GEA WTT, GEA Ecobrazex and GEA PHE Systems NA with production locations in Germany, Sweden, the USA, Canada and India produce gasketed, fully welded and brazed plate heat exchangers for worldwide distribution for use in almost all industrial applications. GEA EcoServe – the GEA PHE Systems service organisation – operates customer service centres in many countries to provide a rapid and competent maintenance and spare parts service, all around the world.



2 x 100% lube oil cooler



Changeover valve

Energy from intelligence

Everyone wants a warm home. Everyone wishes for a comfortable life and a secure future. All that requires energy, for heating, for production, and for supplying electricity to a multitude of modern everyday appliances. But energy is also needed to develop and implement intelligent, sustainable strategies for the further creation of energy, because fossil fuel supplies are limited, and technologies for utilising renewable energies are not yet sufficiently advanced.

Your dedication to find the most efficient new sources and uses of energy will determine the fate of future generations. GEA PHE Systems supports your endeavours with highly efficient plate heat exchangers.

Smaller and better

In the past, there were no alternatives to shell and tube heat exchangers (S&T). However, thanks to continuous innovation, GEA PHE Systems has given the plate heat exchanger principle a new technical advantage. Modern plate heat exchangers can replace S&T in almost all areas of energy production. This will give you the following advantages:

- reduced investment and installation costs
- simple installation and servicing
- up to 80% saving on space compared with a S&T of the same performance
- higher performance and heat recovery efficiency
- high flexibility through simple performance adaptation to changing requirements
- compact design which enables plate heat exchanger integration into assemblies
- lower operating weight due to minimal volume use of minimal temperature differences

The highly developed plate heat exchangers from GEA PHE Systems can cope with pressures of up to 25 bar and temperatures of up to 180°C in almost all areas of applications.

Two are better than one to keep things cool

The safety aspect in power plants calls for a double safety strategy. That is why GEA PHE Systems produces double cooling units, complete with all regulating valves and fittings, providing 2 x 100% performance! This way, even if one unit is being serviced, the power plant stays operational to deliver electricity and heat reliably.

It's in the mix

Block type thermal power plants are highly versatile: They can be optimised either for electricity or for temperature control. Accordingly, the question of electricity or heat production defines the design of the plant and, for instance, determines whether a turbine or a diesel/gas engine will be used. Further criteria are the specific local infrastructure for the primary energy carrier, the required performance class, system costs and also, whether a low or high pre-flow temperature is to be a for secondary use. The desired ratio of electrical and thermal performance also plays an important part in the selection of system technology. With its worldwide experience, GEA PHE Systems is your expert technology partner to find answers to your questions.

Even when you have decided whether it will “knock” or “whistle”, there are still some design alternatives for adapting the system to particular requirements: Gas or steam turbine, or a combination of the two? Fast or slow operation with two or four-stroke cycle, or a combined gas-diesel engine?

Simply listing these basic parameters demonstrates the complexity of the technological challenge posed by supplying energy. Economical and ecological systems always require an individual mix of top quality engineering from all parties involved. With its applied and trusted plate technology, GEA PHE Systems can take care of one of the key components of combined cycle heat and power operations.



Vasa power station, Cottbus



E-on, pumped storage power plant



Vattenfall, combined heat and power plant Berlin Mitte

Towards the future with bundled energy

As far as environmental protection and efficiency are concerned, power plants which produce either heat or electricity exclusively are no longer at the forefront of technology for new systems. The alternative is a combined cycle power plant (CCPP). In addition, modern CCPPs emit less pollutants and greenhouse gases than conventional power plants. CCPPs are available in all performance classes: from a refrigerator-sized unit for single houses to football-pitch-sized multi-module plants covering the requirements of entire industrial complexes or town sectors. GEA PHE Systems can provide the right plate heat exchanger for any plant size.

Industrial and commercial companies with energy-intensive production can particularly benefit from the high efficiency potential of CCPPs, because such companies generally have very consistent

electricity and process heat requirements. A CCPP tailored to specific requirements can make a company independent of energy suppliers. Through the integration of absorption refrigeration systems, a CCPP can even provide process cooling. With such a combination of heat, power and cold, you can also capitalise on the extensive know-how of GEA PHE Systems in cooling technology.

Power providers must be able to deliver energy under strongly fluctuating load requirements. With a precise basic load calculation and modular system structure, they can benefit from the advantages of CCPPs. The decentralised location of smaller CCPPs enables them to minimise district heating pipeline losses and, on short distances, to cover heat requirements of companies without their own power plants.



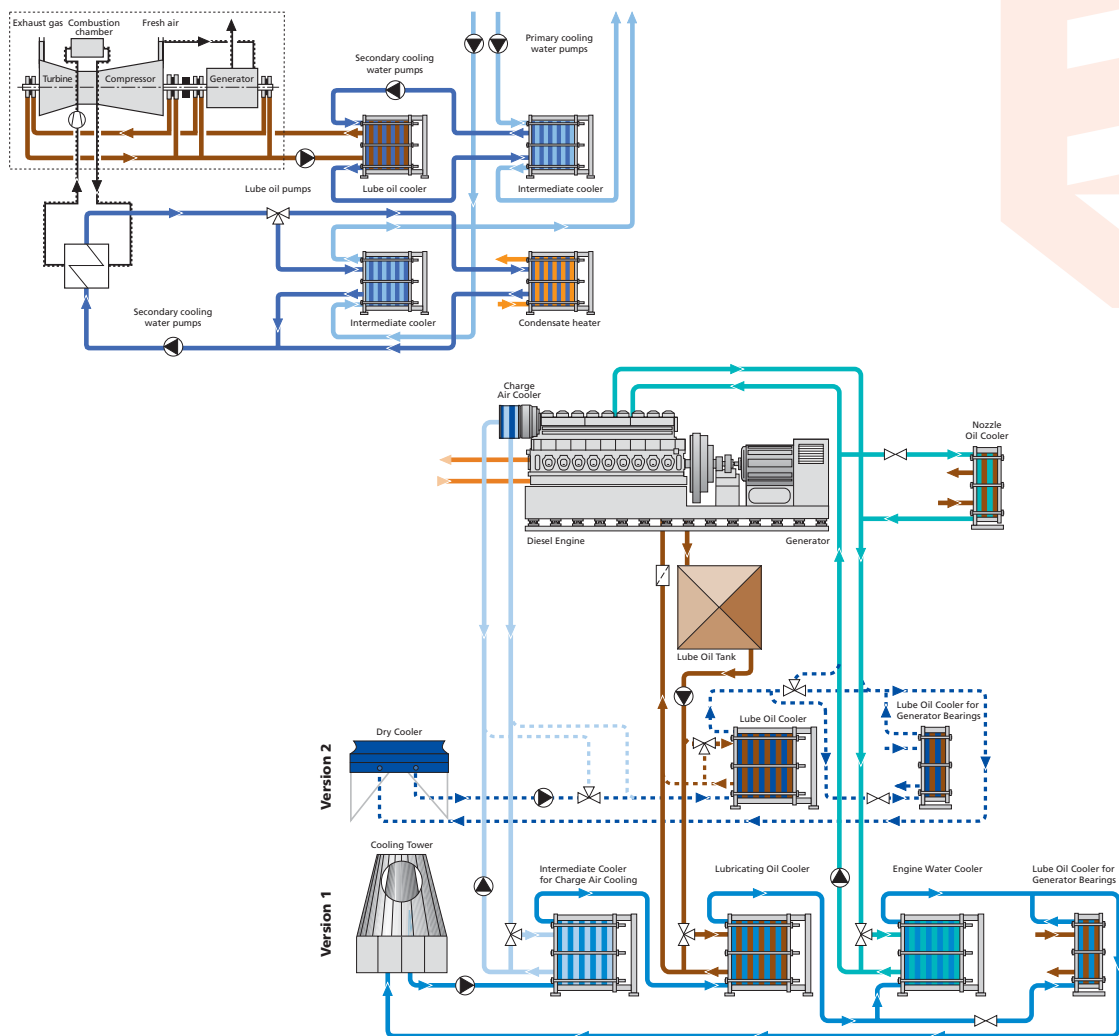
Vattenfall power station, Boxberg

The right spin

A variety of circumstances will dictate whether turbines, diesel or gas engines are the right option in your power plant. Whatever your decision, plate heat exchangers from GEA PHE Systems will provide precise and efficient heat transfer and ensure the optimal operation of your units.

Safe turbine operation requires consistent cooling of bearings, lubricants and rotor blades. An optimal degree of primary energy utilisation can only be achieved by extracting surplus heat for secondary use. GEA PHE Systems plate heat exchangers provide a high degree of system efficiency in this respect.

Modern diesel and gas engines reach very high levels of performance, efficiency and stability while maintaining a low emission output. To achieve this top performance, the engines must be driven at the correct operating condition. When it comes to temperature management via plate heat exchangers, many manufacturers trust the know-how and unit quality of GEA PHE Systems already during their projection phase.



We show profile

In the plate heat exchangers from the Varitherm and NT Series, we offer particularly suitable solutions for the requirements within the energy sector.

NT Series

A seamless continuation of the successful Varitherm plate concept is the NT Series. The further improved plate profile requires less heat transfer surface for the same performance. It was developed in accordance with the latest hydro- and thermodynamic know-how, in collaboration with the University of Hanover. With NT, even the smallest temperature differences can be utilized economically.

The new sealing and assembly technologies, EcoLoc and PosLoc, ensure a perfect fit of gaskets and plate pack. Different lengths and widths enable configurations to be designed for precise operating conditions. With special materials, the equipment of the NT Series can be adapted to special process requirements.

Varitherm

Over 40 different plate sizes and designs in the Varitherm range enable an optimal adaptation to all cooling or heating requirements. The largest Varitherm units enable a flow of up to $3600 \text{ m}^3/\text{hr}$. Varitherm has also proven to be used as highly efficient condenser worldwide.

As with all gasketed plate heat exchangers from GEA PHE Systems, Varitherm benefits from low investment and servicing costs and can be supplied in different material combinations and sizes, being a classic in modern production quality.



Vattenfall power station, Boxberg



E-on, pumped storage power plant



Varitherm

NT Series

GEA EcoServe: for a long life

GEA EcoServe – the service organisation of GEA PHE Systems – offers you an extensive international service network. Whether you use products by GEA PHE Systems or by another manufacturer – at GEA EcoServe you receive complete service from a single source, whenever and wherever you need us. For maintenance and repair we use high-quality spare parts exclusively for all makes. This guarantees reliable seating, optimum function and a long service life.

GEA PHE Systems enjoys international respect

With plate heat exchangers from GEA PHE Systems you reach optimal energy usage, security, and economical as well as ecological operation. In countless power plant projects our customers have shown their trust in the performance and reliability of our units. Our plate heat exchangers fulfil demanding duties around the world in cooling, heating and condensation.

References:

- **Berlin Mitte combined heat and power plant**, Germany
- **Gas and steam plant BASF Ludwigshafen**, Germany
- **Tapado do Quteiro power plant**, Portugal
- **Nehuenco gas and steam plant**, Chile
- **Majuba power plant, Perdekop**, South Africa
- **Sutton Bridge power plant**, Lincolnshire, England
- **Central Dock power plant**, Buenos Aires, Argentina
- **Cuiaba power plant**, Brazil
- **Yangsheng coal-fired power plant**, Shanxi, China
- **San Marcos power plant**, Texas, USA
- **Ho Ping power plant**, Hualin, Taiwan
- **Besos power plant**, Spain
- **RWE Energie power plant**, Germany.



Service on site



CIP device



Vattenfall, combined heat and power plant Berlin Mitte

GEA PHE Systems Competence in Heat Transfer

With emphasis on the highest quality standards and constant innovations, GEA PHE Systems continues to expand its market position: Within the GEA Process Equipment Division, GEA Ecoflex together with GEA ViEX, GEA WTT, GEA Ecobraze, GEA PHE Systems NA and GEA EcoServe forms GEA PHE Systems, the Center of Competence and Service Center for gasketed, fully welded and brazed plate heat exchangers of GEA Group:



- HVAC
- sugar
- paper
- life science
- power
- refrigeration
- chemical
- food
- marine
- renewable energy



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