ELWA

systems for energy

ELWA

Electric continuous flow heaters for industrial and maritime applications – ELWA is one of the world's leading manufacturers. We design and manufacture a wide assortment of pre-heating units for any kind of medium. Control equipment and cabinets, measuring equipment or process visualisation. ELWA can provide the perfect solution. And if it is not available yet, then we will design it.

ELWA – the name for uncompromising quality.

ELWA defines itself through its high-quality products. The peripheral equipment for large diesel engines or industrial installations is our core business. Including electric flow heaters, heat exchangers, combined with pumps, filters and control equipment, we deliver the perfect product to any customer and for any application. If a task gets challenging, it will make us even more ambitious to find the optimal solution.

Tradition and innovation

The ability to meet any technical challenge comes from experience. ELWA has been successful in business since being founded in 1931. Since then, we have established an outstanding knowledge base which has been extended from generation to generation. But not even ELWA can rely on tradition alone. Hence, we rely on the innovation and on the excellent training of our staff. Vision moves us forward and delivers efficient solutions for our customers.

Quality

Made in Maisach – this is a guarantee of quality. In our state-of-the-art production facilities 20 minutes west of Munich, we manufacture according to environmentally friendly principles and the most exacting standards. Optimised production processes provide the highest quality levels and short production times. Our international customers can rely on our certification according to DIN EN ISO 9001. All products that leave our production facilities are top quality.

Customer Relations

Our working relationship with some of our customers goes back to 1931, when ELWA was founded. There could hardly be a better demonstration of quality than this expression of confidence. Therefore, we always strive to give each of our customers optimum advice and to deliver the best solutions to them. This applies irrespective of whether the task in hand is to deliver complex systems for power plants, or just a spare part.

Supplier relations

As with our customers, we have maintained long-lasting business relations with our suppliers. For us, sustainability and preferred suppliers with environmentally friendly production are important. Quality and reliability are important characteristics that we both expect and appreciate. Our carefully established network makes it possible to ensure that the products delivered to our end users contain only high-quality components.

Network with research facilities

To keep our leading position in technical development, we maintain close relationships with universities and other research facilities. This fruitful cooperation delivers advantages to all parties involved. And lastly, it ensures that the applied technologies for our customers are always state-of-the-art.

Everything from a single source

The motivation and flexibility of our staff, the established network between internal and external research and development merge to the advantage of our customers: We provide perfectly designed and manufactured products. From problem analysis and brainstorming to 3D-modelling and individualised products – ELWA offers all of these from a single source.

Formula for success: The perfect combination of high-quality craftsmanship and automated production.

Thanks to its flexible production strategy, ELWA can react quickly to new demands and cost effectively produce small series or individual units.

SHIP TECHNOLOGY

The maritime industry faces a challenging future. The safety rules and environmental regulations are getting stricter. The freight business has to cope with even tighter schedules and cruise liners are developing at a very fast pace. On any type of ship, the highest levels of reliability of all components are indispensable. Because safe technology protects maritime habitats.

CRUISE LINER

SUPER TANKER

FPSO

MEGA YACHTS

ELWA

Our course is set for optimised efficiency.

ELWA is at home on the high seas. Whether super tankers, cruise liners, submarines or container ships – we have been supplying components for the shipbuilding industry for more than 75 years now. With passion and without compromise. After all, we know that only first-class quality guarantees safe and profitable marine operations.

Technology
The first ELWA product to be used on ships was the electric continuous flow heater, a unit that we have put through continuous further development, bringing more and more new product variants onto the market. However, we broadened our focus more than 30 years ago when we began to get involved in plant construction. Our team of engineers develops and designs customer-specific modules, and combines these with optimally adapted control systems. Switch cabinet construction is an important building block in our product range, and one that supplements our company's high-quality products with effective functions. We use adapted regulators and programmable controllers which permit a direct link-up to higher-level control systems. Whether deck washing systems for mega yachts, highly complex fuel supply systems for super tankers, pool heating or bilge water processing: every one of our customers' requirements represents a challenge for us, and one that we are happy to meet.

Cooperation
Decades of cooperation with renowned engine manufacturers and shipyards mean we have the experience to find the right solution quickly. Working jointly with our end users and universities, we are available to be called on as committed development partners.

After sales
Quick responses in after sales and high levels of availability of all spare parts mean that safe and efficient maritime operations are guaranteed. For ELWA, it makes no difference whether the heater is fifty years or two years old: we deliver spare parts quickly and reliably.

Expertise in ship technology
> Cooling water preheater (electric/steam/thermal oil)
> Lube oil preheater
> Fuel preheater
> Nozzle cooling units
> Bilge water heater
> Central cooling units
> Viscosity/temperature control systems

Vessel types
Aircraft carriers, cruise liners, container vessels, submarines, tugs, super tankers, tall ships and mega yachts. ELWA products are in daily service on all kinds of vessel.

Energy efficiency
Careful management of available resources and design for efficient use of energy are fundamental principles in the design, production and application of our products. At the same time, we consider not only the direct effects on the equipment but also the influences on the ecological balance sheet of the system as a whole.

Protecting the environment
Protection of maritime habitats enjoys the highest priority at ELWA. We design and manufacture technology which actively reduces emissions and pollution:
> FWE (fuel water emulsion) technology for MAN diesel engines to reduce nitrous oxides in the exhaust gas
> Bilge water heaters for separating contamination from the water

Classification
ELWA products are available with certificates from all classification authorities: Lloyds Register, American Bureau of Shipping, Germanischer Lloyd, Bureau Veritas, Rina, MRS, CCS, ...

ELWA equipment ensures reliable operation on naval ships with up to 5G acceleration

Fully automated ELWA fuel supplies for supertankers (booster modules)

SHIP TECHNOLOGY

PRODUCT EXAMPLES

KVE — **Electric cooling water preheaters**

The KVE units are used to keep the temperature of cooling water circuits in large diesel engines at operating value. This means the engines remain ready to start at any time. The KVE series is available with heating power from 3 to 600 kW. The circulation pump and power unit are integrated and perfectly adapted for the application.

KVD — **Preheater with heat-exchangers**

Like the electric units, the KVT/KVH/KVD series can be used to preheat any kind of liquid filled circuit. Instead of the electric heating elements, we use heat exchangers. The units are equipped with a heat exchanger, control system, pump and control valve.

DKW — **Nozzle cooling units**

These units are used to preheat the cooling water circuits of injection nozzle systems, as well as for cooling in continuous operation. In principle, these units can be used for other applications when precise temperature control in the range 20 – 60 °C is required, and there is an external cooling water circuit available.

ENERGY & EFFICIENCY

Energy is not a topic for future discussion, but an integral part of our lives today. Economical use of finite fossil energy resources and effective use of alternative energy sources are essential.

ELWA products are developed with the clear objective of maximum efficiency and sustainability.

ELWA

ELWA stands for efficiency.

Vanuatu in the Pacific, Weipa in Australia, Jiangnan in China, Palma de Mallorca, wind power plants in the Baltic: ELWA products are in service in power stations and with consumers in countless locations all around the world. The highest standards are the basis for reliable power supplies. Installations in hospitals or nuclear power stations leave no room for compromise.

Independence through reliability

Reliability and efficiency are key factors for power generation. ELWA develops and manufactures specially designed components and systems for applications in power stations of all types. Photovoltaic, wind energy, gas turbines, diesel engines or nuclear power – process stability is essential.

Wind energy

The gearboxes of wind turbines are exposed to extreme forces because of the high step-up ratio from the slow-turning rotor to the generator frequency. Optimum lubrication is essential to avoid costly malfunctions. Specially designed ELWA preheaters reliably keep the lubricating oil at the required minimum temperature. Anywhere and at any time.

Conventional power plants / Nuclear power plants

In large-scale power plants, ELWA heaters are used for treating the lubricating oil for the turbines. The long-term quality and service life of the lubricants is a key factor for operational costs and availability of the system. By nature, operational safety of nuclear power stations requires even higher standards compared to conventional plants. ELWA products have been in daily service in these types of power station for decades.

Diesel engine power plants

ELWA can provide a wide range of products for this type of power plant. Injection nozzle cooling systems, cooling water preheaters, lubricating oil heaters or technical water supply units. Almost the complete peripheral equipment for operating fluids can be provided with products from ELWA.Together with partner companies, we manufacture complete fuel systems for almost all types of fuels: light diesel oil, heavy fuel oil or biofuels (rapeseed oil and palm oil). If the engine can burn the fuel, we can deliver it with the necessary operating values.

Power-to-Heat

ELWA P2H systems can convert excess electrical power into heat with precision down to the second, and in so doing, relieve the grid of the building and of the power supplier. Its variable control prevents the need for grid expansion at a small scale – in the building grid – and at a large scale, in European grid expansion.

Efficiency and environment

ELWA develops systems which use seawater for heating or cooling, so as to reduce the energy consumption of buildings or industrial installations significantly. Our commitment to developing these technologies is the logical consequence of our true sense of responsibility for our environment.

Expertise in energy and efficiency:

> Lubricating oil preheaters
> Cooling water preheaters
> Central cooling systems
> Pressure booster stations
> Fuel supply units
> Measuring and control systems

Offshore wind farms: Reliability and long service lives for the oil supply system ensure economical operation

ELWA products in power stations. Safe operation due to decades of experience and the highest quality standards

ENERGY & EFFICIENCY

PRODUCT EXAMPLES

BIO-FUEL-BOOSTER — **Fuel handling**

The bio-fuel boosters are developments of the fuel modules that we have been supplying for maritime propulsion or diesel engine power plants over many years in collaboration with long-term partners. This series has been specially designed for fuels of biological original that are as corrosive as they are sensitive.

4700 COMPACT — **Electric continuous flow heaters**

The ultra-compact 4700 heater series allows gentle heating with minimum external dimensions. The heating power can be smoothly regulated and provides precise temperature control. This type of heater can be used if maximum availability is required with minimum space, e.g. in gearbox housings of wind energy plants.

POWER-TO-HEAT — **Conversion of electrical Power-to-Heat**

ELWA P2H system provide flexible negative balancing energy, preferably connected to district heating systems because of the permanent high demand for thermal energy.

DEA — **Pressure booster stations**

ELWA pressure booster stations are used in power stations for supplying technical water or in urea systems for catalytic converters (see Industry).

INDUSTRY

The diversity of our customers from heavy industry, plant engineering, medical technology or the chemicals industry requires absolute flexibility in design and manufacture of our products.

Our internal processes, our production facilities and our network of partner companies have been designed for this purpose.

STEEL MILLS

PHARMACEUTICALS

OIL SEPARATORS

PLANT ENGINEERING

ELWA

Custom-made and cost-efficient.

One of the main advantages that ELWA offers its customers is individual production. We manufacture most parts of our core products on-site and we can also produce small-batch series or even single units cost-effectively. We can therefore meet all technical and economic requirements of our customers.

Flexibility in design

Our electric continuous flow heaters can be adapted regarding heating power, operating pressure, operating voltage, position of connecting flanges or material. The units can therefore be used for almost any kind of application. In extreme cases, this means: polished surfaces for medical applications and food technology or high-alloy steel for very aggressive liquids like desalinated water.

Individual plant engineering

Our customers can not only choose between almost infinite design options – we also offer complete plant solutions with perfectly adapted expansion options in order to fulfil all kinds of tasks in the industrial field.

We take components from long-term suppliers and use them to supplement our own products, e.g. to produce processing systems for technical water, oil pumping stations or filter systems. We can put our many years of experience and our flexible production options to optimum use in individual industrial fields. On behalf of our customers, we develop air heaters, heating and cooling baths, indirect preheating units, machine tool heating systems, pressure boost systems and dosing modules.

In combination with power units and controllers from our in-house switch cabinet construction arm, we are capable of building autonomous and reliable systems that interact optimally both with higher-level instrumentation and control systems as well as with linked-up hydraulic systems.

Expertise in industrial applications:

> Continuous flow heaters
> Pressure boost systems
> Power units
> Measuring and control systems
> Dosing systems

The range of products that is technically feasible cannot be summed up in just a few sentences. Therefore, it is more important for us to convince you of our expertise and our determination to find the optimum solution for any application. Relationships with our customers – some lasting for several decades now – are firmly based on these principles.

Environmental protection

ELWA is an industrial company itself. Therefore, for us, environmental protection and sustainability in industry start right with production. Intelligent building automation systems switch off ventilation functions, filter systems and lighting when they are not needed. The latest welding equipment reduces current consumption. In the test area, the water used for hydraulic pressure tests on equipment is filtered and returned to the storage tanks.The paint shop has a highly effective filter system in order to keep emissions as low as possible. We also take the same care as for our in-house processes when it comes to selecting materials and ensuring that our products are solidly designed. After all, we are only satisfied with our performance if our customers can use the machines we have provided them with over decades without failures, because then we have created something sustainable.

Specially adapted heaters are used in the pharmaceutical and food-technology industries.

ELWA products for industry – with over 75 years of experience

INDUSTRY

PRODUCT EXAMPLES

SERIES 4600 — **Electrical continuous flow heaters**

Electrical continuous flow heaters in the 4600 series have an almost unlimited range of configuration possibilities. ELWA manufactures almost all components itself, therefore the devices can be adapted to any conceivable application. Operating voltage, pressure, material, process connection, control ... the product adapts to the process, not the other way around.

DA-MKV — **Dosing systems**

ELWA dosing systems provide aqueous media at an exact temperature, with high precision, for a large number of industrial processes. Even when high dosing pressures are involved, the systems still achieve reproducible precision over a broad control range.

ROE — **Preheating unit**

ROE units including electrical preheater and control cabinet. These units can be used to provide heating power to any industrial application where oil or a similar fluid is to be heated. The ROE series is available with heating power from 3 to 300 kW.

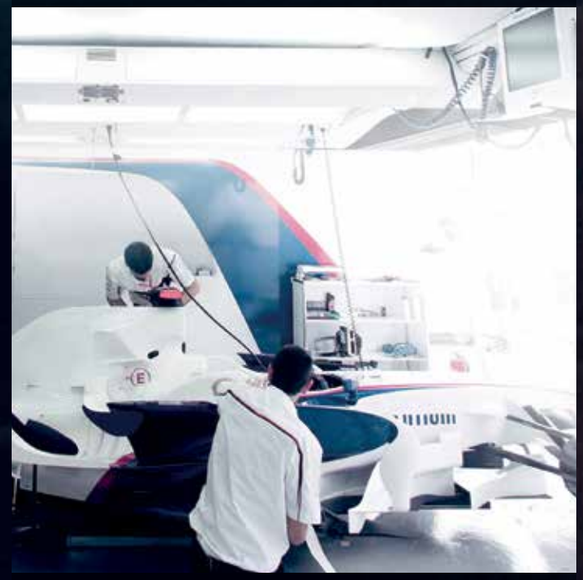
MOTORSPORT

In motorsport, there is no chance for success without precision, efficiency and quality. These preconditions also apply to our products. However, motorsport is also about passion and enthusiasm, representing the best catalyst for extracting top performance from our engineers.

ENGINE TEST RIGS

GEARBOX TEST SYSTEMS

WIND TUNNELS



ELWA

Motorsport is all about precision, efficiency and passion and thus our ideal field of activity.

In motorsport, we are operating at the absolute peak of the high-end range. On the track, fractions of seconds count. And tenths of degrees in the pits. ELWA is right at the forefront.

Formula 1 as the flagship of motorsport demands absolute precision during racing and in development. With such thoroughbred engines, optimisations can never be made in major steps. Reproducible test conditions on the test rig are therefore all the more important. Our heaters are optimally suited to keep the service products at precisely the specified temperature. The free configuration ability means that even tight installation conditions do not pose a problem. The units can be equipped with a large number of process and measurement connections. The adapted power units mean that the heating power can be controlled quickly and smoothly.

For use on the race track and on the test rig, we produce compact and fully automated oil flushing modules by means of which gearboxes or engines can be preheated, or test rigs can be flushed in order to clean the circuits. The circulation volume, temperature and other process parameters can be selected on the touch panel.

As a technology transfer from the shipbuilding/power plant sector, KVES preheater units can be used as high-performance heat sources for wind tunnel testing of the radiator in the bodywork element. Heat exchangers enable the heat to be decoupled in parallel for the oil circuits. Spin-offs from racing cars to series production are one of the motivations for car makers to take part in motorsport. In parallel, ELWA products are also used in the development or production of series production vehicles. This starts with the input stock in the steelworks, where heaters on the rolling mills bring the emulsions and lubricating oils to precise temperature values.

Manufacturers use our products on engine and gearbox test rigs. To allow tests of air conditioning systems, we produce heaters using special steels and provide them with thermal insulation for extra-low temperature ranges down to -50 °C.

Even though, when required, we devote great attention to maintaining ultra-low temperatures precisely, we never give the motorsport topic the cold shoulder. We share our customers‘ enthusiasm. Put our precision and our speed to the test.

Motorsport/automotive expertise

> Test rig lubricating oil preheater
> Test rig cooling water preheater
> Oil flushing/filtering modules
> Central hot water supply
> Ultra-low temperature heater

There is no room for compromise when manufacturing peripheral products for Formula 1

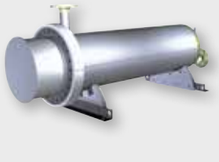
MOTORSPORT

PRODUCT EXAMPLES

OSF — **Oil flushing modules**

Compact & mobile system for preheating gearboxes and engines on the test rig and on the racing track. Additional functions: flushing test rigs with clean oil, evacuating the external system with compressed air. With adjustable pump power and heated tank with level monitoring. Operation via touch display.

4600-TT — **Ultra-low temperature heater**



This type is a special version of the 4600 series, for which special materials are selected and thermal decoupling of the mountings is provided, in order to make it suitable for use with very low media temperatures. For example, applications are possible on climate-controlled test rigs for media temperatures from -50 to +100°C.

KVES — **Heat source**

High-performance continuous flow heaters for preheating cooling water or as the central heating water supply for test rigs or wind tunnels (e.g. radiator performance test in the bodywork section). The heaters are available with individual power levels from 3 kW to 600 kW and an optional control unit.

THE COMPANY

“Being an entrepreneur means taking responsibility. For products, for quality, for market reliability and, last but not least, for employees. Right from the word go, it has been our policy to be the best in everything. First-class solutions for satisfied customers, as well as a friendly working atmosphere in the company, for a contented workforce. We have succeeded in all of these areas since 1931. And we want to continue in the same vein. According to our grandfather‘s and father‘s principles.“

Markus Hilpoltsteiner,
Managing Director

A history of success

Things were by no means plain sailing when Anton Hilpoltsteiner founded ELWA in 1931. However, with considerable boldness and entrepreneurial farsightedness, he laid the foundations for what is, today, a globally leading company. Much has changed since then. The fundamentals have remained unchanged though: boldness and entrepreneurial farsightedness.

ELWA‘s history began in 1931 when Dipl. Ing. Anton Hilpoltsteiner bought the electrical department from the insolvent assets of a Munich-based company, banking its future on building electrically heated devices. In the early years, ELWA produced electric cookers for domestic and industrial applications. The development of electrical continuous flow heaters was also set in train in this period. In addition to series production at that time, ELWA also offered its customers special fabrications for specific applications. The electrically powered on-board galleys for Zeppelin airships were developed and produced by ELWA.

At the start of the 20th Century, the electrical industry was still something rather exotic, but it soon underwent significant growth and the family firm, ELWA, also profited from this development. The company came through the Second World War without suffering serious damage, and was able to resume normal operations smoothly at the end of the conflict. The need to provide equipment for private households and the production industry meant that ELWA enjoyed full order books, making modernisation and expansion necessary. In 1962, the old production hall and the villa dating back to the founder‘s time were linked together by a modern administrative block. In this period, the two most important branches of the business were building canteen kitchens and producing continuous flow heaters for ship-building and industry.

In 1971, A. Hilpoltsteiner Senior died and the company passed into the hands of his daughter Hedwig Hausler and son A. J. Hilpoltsteiner, who became the Managing Director and guided ELWA through the 1970s and the difficult times in the 1980s. Two important decisions were taken during this period: production was expanded to include the areas of plant construction and switch cabinet building.

Ever since 1985, switch cabinets, pumps and heaters have been combined into efficient systems. The success of reliable ELWA products fuelled international interest in technology ”Made in Germany“. Contacts and business links were forged throughout the world.

ELWA established itself as a strong, innovative company in the international market. By 1988, ELWA had become a standard supplier for many engine manufacturers and IT systems began to be introduced. The preheater area continued to develop further. Important cooperation deals such as with fuel module manufacturers secured the market position.

In 1993 and 1995 the development of control technology and plant construction was pushed ahead decisively. The product range was extended time and time again. In 2002 A. Hilpoltsteiner passed away unexpectedly, at a sadly early age. Today the company is managed by Dipl. Ing. (FH) Markus A. Hilpoltsteiner in the third generation.

Canteen kitchen construction, which had up to that point been a second pillar of the company, was abandoned. The company grew, enjoying increasing success. Quite soon, the production facilities on Munich‘s Landsberger Strasse had become too cramped. At the turn of the year 2008/2009, ELWA moved to its new facilities in Maisach, located on the outskirts of the Bavarian metropolis. On a production area of 6400 m^2 with the latest working conditions, excellently trained employees manufacture ELWA devices for shipbuilding, industry, energy systems and motorsport.

Flexible, fast and reliable – the right solution for all requirements.

Hydraulic and electrical checking of all devices on the computer-controlled test area. The complete data for all products is logged.

Alignment of the welding structure using adjustable gauges guarantees optimum dimensional accuracy.

ELWA

Outer strength – inner values.

Production in the new halls in Maisach was exhaustively planned, new machinery, crane systems and warehouse systems were purchased and the entire technical systems had their processes optimised. ELWA produces to the highest standard.

However, this is not all there is to ELWA. ELWA is a living company which is in a dynamic relationship with its environment and demonstrates its social commitment.
The company's buildings have been designed not only according to economic principles, but also with a view to aesthetic aspects. The aim is for ELWA employees to feel good in their workplace. This includes ergonomics, cleanliness, lighting and clean air. Overall, we place great emphasis on achieving the most positive ecological balance possible. Environmental conservation is important for us, as is promoting new technologies. It is not for nothing that a solar thermal installation on the roof of our new building provides environmentally friendly hot water.

ELWA enjoys a lively exchange with schools and universities. For one thing, this helps us to stay at the cutting edge. For another, it provides young people with the opportunity to express their thinking and to try out new ideas.

Last but not least, we provide energetic and financial support to sports clubs, social organisations and open-source projects. After all, we are firmly convinced that by working together, we can create better solutions.

CONTACT

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-22866-0
fax +49-8141-22866-10

email sales@elwa.com
web www.elwa.com

ELWA

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-228 66-0
fax +49-8141-228 66-10

email sales@elwa.com
web www.elwa.com

ELWA

Power-to-Heat

P2H systems – intelligent conversion of electrical Power-to-Heat

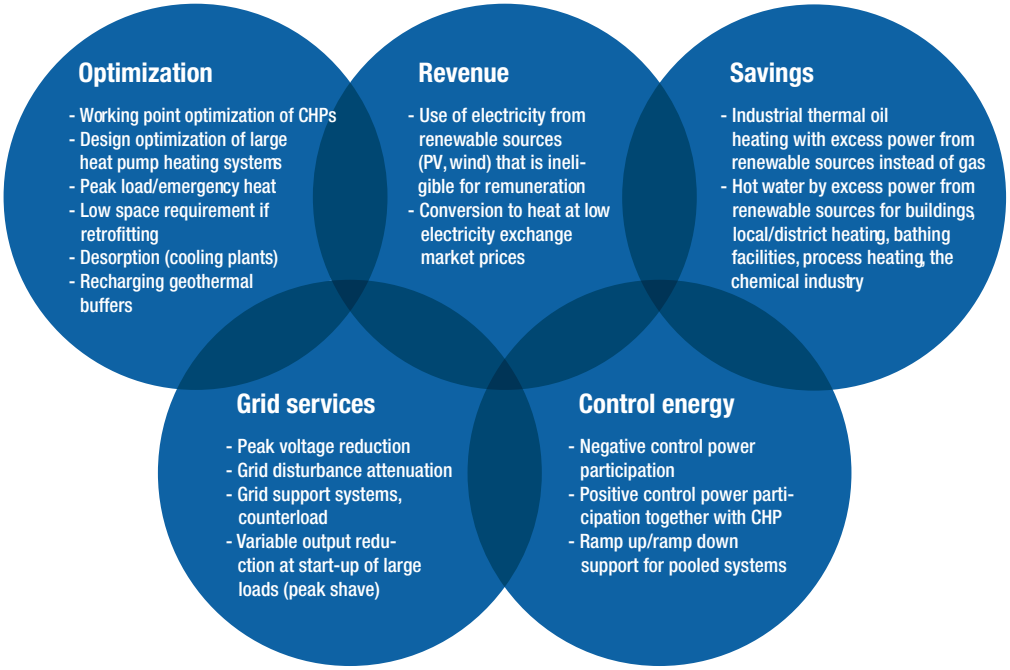
ELWA P_2H: More value.

Using excess energy multiplies its value.
Up to now, the efficiency of electrical power supply systems was a question of balance:
Differences between power generation and electrical energy consumption had to be balanced out by taking measures that are, to some extent, complex. ELWA has the solution – it can be easily installed used for retrofit in a space-saving manner, it lowers investment costs and pays back quickly: ELWA P_2H systems. With these systems, the excess power generated primarily from renewable energy can be utilized, which adds value with greater yield.

ELWA P_2H systems can convert excess electrical power into heat with precision down to the second, and in so doing, relieve the grid of the building and of the power supplier. Its variable control prevents the need for grid expansion at a small scale – in the building grid – and at a large scale, in European grid expansion.

Clever combinations for quicker amortization

By combining several application benefits, the ecological and economic advantages are multiplied as well:
Considerable added value from investment – lower TCO, higher ROI/IRR and quicker amortization – is already occurring if two or more of the following application groups overlap.

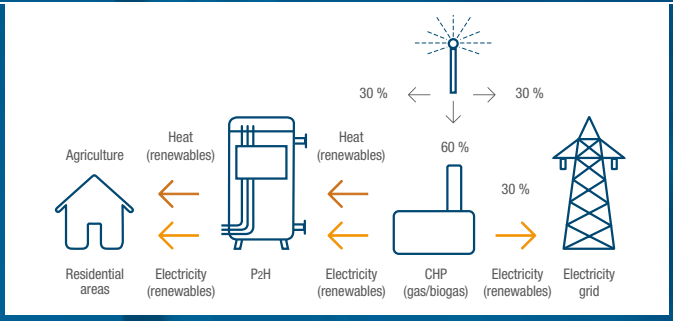


Other application advantages: ahead-of-schedule legionella treatment with excess electrical power, recharging of shallow geothermal energy buffers, reduction of primary energy factor Pf with district heating supply, return temperature increase at biomass heating, supporting variable power ability of biomass powerstations, counter-load for black start generators.

ELWA

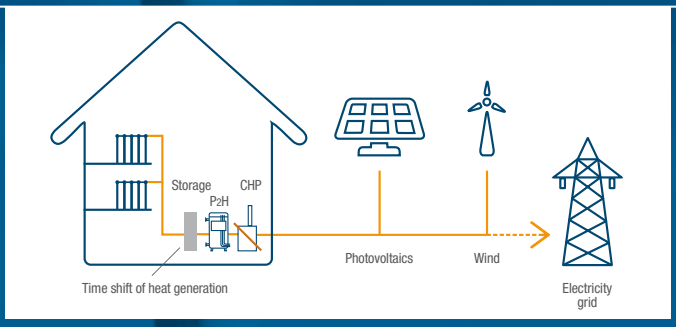
TYPICAL APPLICATIONS

COMBINED POWER AND HEAT STATIONS (CHP)



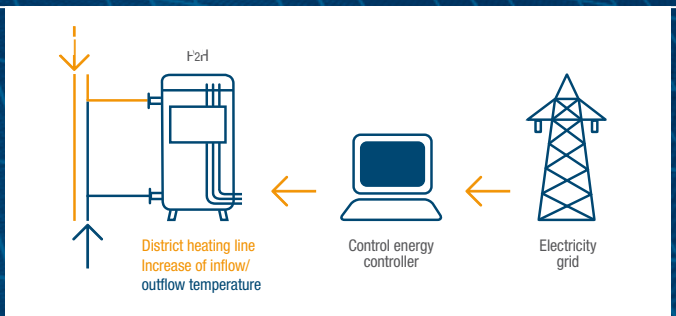
Meeting the grid operator's specification to reduce electrical supply to 30% of CHP nominal capacity due to grid overload: The CHP has to be reduced to only 60% of nominal capacity (less material stress); the P2H heater converts the excess electrical power to heat. Result: Both 90% of the heat supply and the requirement for 30% maximum grid supply are met.

USE OF EXCESS POWER



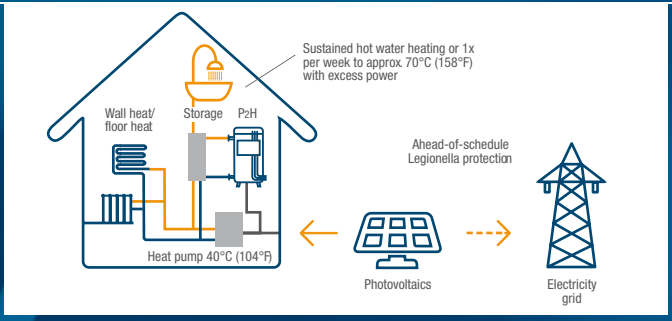
Some electrical power from renewable sources is not eligible for remuneration because otherwise, the power lines would be overloaded. The ELWA P2H system transfers the output that the grid cannot accept to the building/local/district heating system. This reduces the use of fossil energy sources. Additionally: supplemental revenue by using electricity from the grid when electricity exchange market prices are low, emergency/peak load heating.

ADDITIONAL REVENUE FROM CONTROL ENERGY



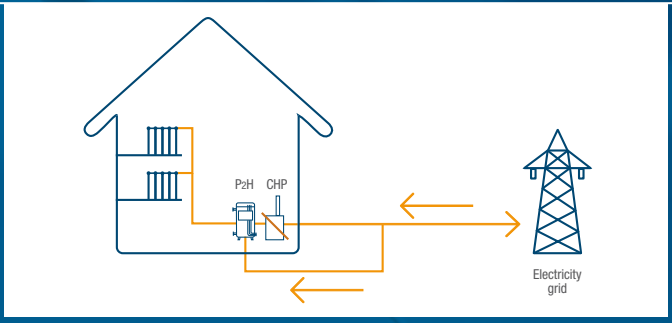
Intake of control energy (primary/secondary control power, minute reserve power as necessary) and reasonable energy use by transferring it to the heating grid. Grid relief, reduction of fossil-based power consumption, increase in maintenance interval length for the main heat source, support at pooled ramp-up and down. In addition, positive control power can be offered by switching off the ELWA P2H system on request during the offer period.

LEGIONELLA PROTECTION



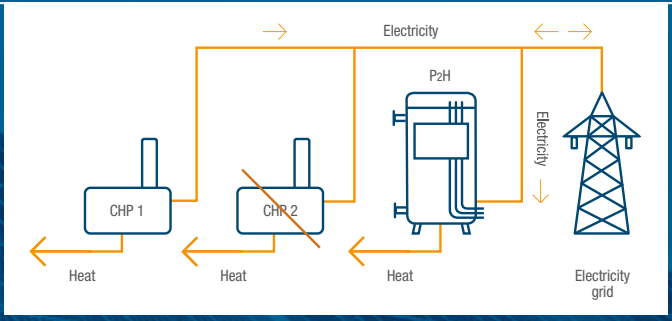
With heating systems that use heat pumps or low temperature furnaces, on appropriate days, excess electrical power that is not eligible for remuneration can be used at midday to provide ahead-of-schedule Legionella protection in the hot water tank with the ELWA P2H system (heating up to 70–75°C (158–167°F). This enables savings due to heating system design optimization with efficient, low water temperatures. In addition: emergency heating / peak load heating.

INCREASED SUPPLY SECURITY



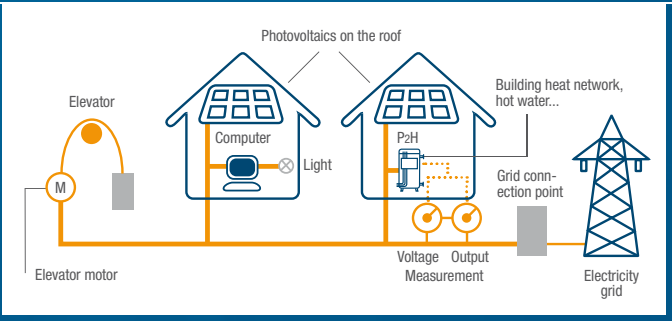
The ELWA P2H system can be used as a backup heating system to increase supply security, in particular with heating systems that have moving parts (due to malfunction, maintenance if pellets, oil or a heat pump is used) or in case of a district heating supply. Optimization of plant size and avoidance of a peak time gas heater (base fee, maintenance, chimney sweep). In addition: supplemental revenue from control energy or from not remunerated excess power.

OPERATING POINT OPTIMIZATION



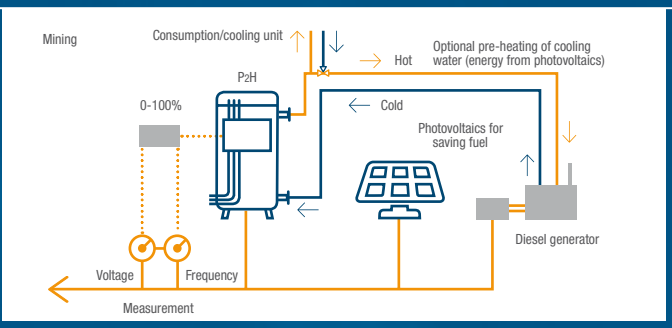
Avoidance of switching on another CHP (or another heat pump) in case of slight heat demand increase in a cascade array. This prevents inefficiency due to double partial-load operation, which also results in higher operating hours. Instead, the ELWA P2H system provides the required residual heat generation heat, if necessary using CHP power. In addition: peak time heating and emergency heating.

GRID OPTIMIZATION



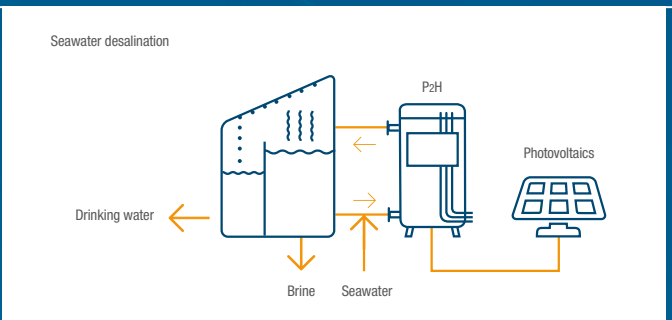
Short-term reduction of heating output when switching on large motors inrush current and avoidance of expanding the grid supply line (service charges, building cost subsidy) when installing renewable energy sources. In addition: excess voltage/wave filtering, balancing of asymmetric load, process heat supply based on available residual grid capacity (process heat for oil or water, for biomass heating return temperature increase).

VARIABLE COUNTER-LOAD WITH GRID SUPPORT OPERATION



Frequency and voltage stabilization of electrical grids in combination with emergency power generators (island solutions) by variable connection and disconnection of the ELWA P2H system. Adherence to the generator's minimum load (approx. 25%) and nominal capacity (100%), in particular in combination with wind and PV power. In addition: optional pre-heating of cooling water using renewable energy sources for quick start availability.

ADDITIONAL BENEFITS WITH RENEWABLE ENERGY SOURCES



Seawater desalination and simultaneous provision of hot water without a grid connection using renewable energy sources. For example, approx. 15 liters of drinking water per day per m² of PV in southern regions. In addition: drinking water treatment in general, thermal recharging of shallow geothermal storage units via PV in the summer.

ELWA

A clear advantage with ELWA P2H systems:

> Additional revenue
> Prevents need for electrical grid expansion
> Lower maintenance costs
> Quick amortization
> Additional/emergency/post heating
> Easy installation
> Easy expansion of existing heating systems (only 1 m² area for heaters (approx.))
> Grid-beneficial operation
> Possible reduction of primary energy factor at of district heating

ELWA P2H continuous flow heater with integrated or externally mounted control box – also for easy expansion of existing plants: The heater requires just 1 m² area (approx.). ELWA Power-to-Heat (P2H) systems are maintenance free and have a long service life.

ELWA

ELWA is an owner-operated company with the third generation at the helm – and with its own manufacturing division right outside of Munich. With about 80 employees in production and distribution, water and oil heaters for industry, transportation and P2H systems are manufactured here, according to high ISO quality standards, of course.

Markus Hilpoltsteiner, Managing Director

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-228-660
fax +49-8141-228-6610

email sales@elwa.com
web www.elwa.com
www.power2he.at

Product lines

ELWA P2H systems

CONTENTS

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With our offers you receive formatted and complete tender texts as a file.

Version

1.5 / 05.02.24 (MH / CK)

GENERAL

FOREWORD

ELWA Power-To-Heat systems were developed to make a valuable contribution to decarbonisation as a highly efficient technology in the area of sector coupling. P2H systems can be perfectly combined with heat pumps, combined heat and power plants, battery systems and large thermal storage units. We will be happy to advise you on how the various technologies can be optimally combined.

Below we briefly present the current product lines. Please note that we can always develop customised projects that deviate from the standard. There is no such thing as impossible at ELWA!

OPERATING CONDITIONS

We combine the switchgear with our heaters for liquids and gases to cover a wide range of temperature ranges and operating conditions. If your process involves higher temperature ranges, for example up to 800 °C for air heating, please contact us.

OPERATING TEMPERATURES

Water / steam	220	°C
Thermal oil	300	°C
Air	800	°C

OPERATING PRESSURE

We can supply systems up to 16 bar as standard, higher operating pressures are possible on request.

EX AREA

We also supply heaters for liquid media in explosion-proof versions. However, the switchgear should always be positioned outside the hazardous area. As we generally switch higher power levels in the P2H area, power losses occur in the switchgear that cannot be sensibly dissipated thermally from enclosures for explosion-proof systems. The SLB and MLB series are therefore not suitable for this purpose.

AGGRESSIVE MEDIA

The material of the pressure vessels and the heating elements can be selected to suit the medium

ELWA P2H PRODUCT LINES

P2H SLB ENZEL SYSTEMS (COMPLETE SYSTEMS)

ELWA P2H SLB systems are tested and ready for operation on delivery. The switchgear and heater are mounted on a common frame. The entire sensor/safety technology is already installed. The user only has to install the power cabling to the switchgear, the cables for communication with the customer's control technology and the pipework to/from the system. Commissioning is ideally completed within a few hours and is limited to coordinating communication with the customer's control technology, checking the installation and fine-tuning the control parameters.

PERFORMANCE VARIABLES (STANDARD)

P2H SLB	PERFORMANCE →	50	100	150	250	500	750	1000	1250	1500
Operating voltage	400 VAC									
	690 VAC									
Switchgear	standard									
	type-tested									
Control system	Controller with touch display									
	Codesys PLC / touch display									

SLB OPTIONS

PERFORMANCE

The power steps in the table represent a sensible gradation. The systems can be adapted to lower outputs by changing the wiring diagram in the heater (reversible at any time).

NOMINAL SIZES

The nominal diameter and position of the connection pieces can be adapted to the hydraulic requirements of the connected system.

CONTROL SYSTEM

The control system used is optimised for the application. Siemens S7 control systems can also be configured as an option.

COMMUNICATION

ModBus TCP is available as standard. Profinet and other bus systems are possible directly or can be connected via gateways. Remote maintenance solutions are optionally available

P2H SLB-PM ENZEL SYSTEMS (COMPLETE SYSTEMS WITH PUMP / MIXER)

ELWA P2H SLB-PM systems are based on the SLB systems with the addition of a speed-controlled pump and mixer. These system types are also ready for operation on delivery and contain the entire sensor/safety technology. The PLC also controls the mixing valve and/or the pump speed to allow power regulation mode while still maintaining a constant output temperature. With these systems, the entire output range can be operated steplessly and a thermal storage tank for example, can be optimally loaded.

PERFORMANCE VARIABLES (STANDARD)

P2H SLB-PM	PERFORMANCE →	50	100	150	250	500	750	1000	1250	1500
Operating voltage	400 VAC									
	690 VAC									
Switchgear	standard									
	type-tested									
Control system	Controller with touch display									
	Codesys PLC / touch display									

SLB-PM OPTIONS

PERFORMANCE

The power steps in the table represent a sensible gradation. The systems can be adapted to lower outputs by changing the wiring diagram in the heater (reversible at any time).

NOMINAL SIZES / PUMP CAPACITY

The nominal diameter and pump capacity can be adapted to the hydraulic requirements of the connected system.

CONTROL SYSTEM

The control system used is optimised for the application. Siemens S7 control systems can also be configured as an option.

COMMUNICATION

ModBus TCP is available as standard. Profinet and other bus systems are possible directly or can be connected via gateways. Remote maintenance solutions are optionally available

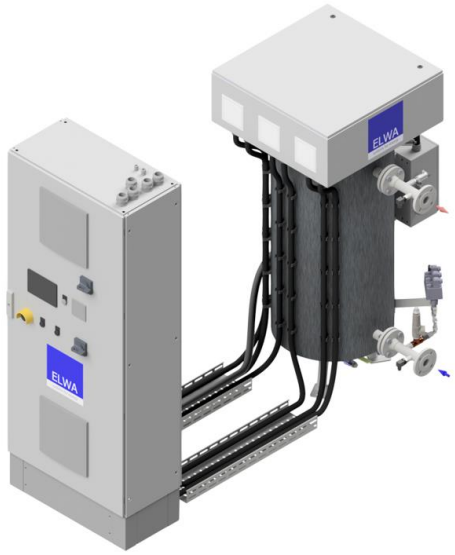
P2H CLB ENZEL SYSTEMS / DECENTRALISED DESIGN

ELWA P2H CLB systems consist of switchgear and heaters as individual components. The systems are mainly used when it is not possible to install complete systems on site. The switchgear and heater are then customised. The components can also be installed at locations further away from each other. Our customers receive a cable pull list for their project for the cabling to be installed on site between the heater and switchgear.

PERFORMANCE VARIABLES (STANDARD)

P2H CLB	PERFORMANCE →	50	100	150	250	500	750	1000	1250	1500
Operating voltage	400 VAC									
	690 VAC									
Switchgear	standard									
	type-tested									
Control system	Controller with touch display									
	Codesys PLC / touch display									

CLB OPTIONS



PERFORMANCE

The power steps in the table represent a sensible gradation. The systems can be adapted to lower outputs by changing the wiring diagram in the heater (reversible at any time).

NOMINAL SIZES

The nominal diameter and position of the connection pieces can be adapted to the hydraulic requirements of the connected system.

CONTROL SYSTEM

The control system used is optimised for the application. Siemens S7 control systems can also be configured as an option.

COMMUNICATION

ModBus TCP is available as standard. Profinet and other bus systems are possible directly or can be connected via gateways. Remote maintenance solutions are optionally available

P2H MLB MODULAR SYSTEM

The ELWA P2H MLB system was developed to flexibly cover even large capacities. The systems can be expanded at any time and are also suitable for high-availability systems thanks to their distributed control systems and individually operable components. As with the SLB systems, we supply ready-to-use units that can be set up on site with the prefabricated pipework within a few hours. A 5 MW system is normally fully assembled within a morning. The pipework cross-sections are selected so that systems up to 10 MW can be assembled directly. Parallel systems can then be used for higher outputs. A central control cabinet is available for communication with the customer's control level, which records and processes the system statuses of all subsystems.

PERFORMANCE VARIABLES (STANDARD)

P2H MLB	PERFORMANCE →	50	100	150	250	500	750	1000	1250	1500
Operating voltage	400 VAC									
	690 VAC									
Control system	Codesys PLC / touch display									

MLB OPTIONS

CONSTRUCTION

The system can be set up inline, back-to-back, distributed or L-shaped, for example

PIPELINES

Victaulic systems are used up to 110°C; welded/flanged pipes are used for higher temperatures

CONTROL SYSTEM

The control system used is optimised for the application. Siemens S7 control systems can also be configured as an option.

COMMUNICATION

ModBus TCP is available as standard. Profinet and other bus systems are possible directly or can be connected via gateways. Remote maintenance solutions are optionally available

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P2H MOD CUSTOMISED PLANT ENGINEERING

Under ELWA P2H MOD, we summarise all projects in which we can apply our decades of experience in the development of complex systems in shipbuilding, power plant construction and industry. For our customers, we manufacture systems for the reliable supply of thermal processes with water or thermal oil as the heat transfer medium. We design decentralised or centralised switchgear and work together with proven manufacturers of pumps and heat exchangers to create individual systems that take into account both the local conditions and the requirements of the process. Thanks to effective project management and a high degree of flexibility, we also support our customers with conversions during operation. There are virtually no limits to individualisation here. The more complex the task, the better!

ELWA

Power-to-Heat

Case Study Power-to-Liquid (PtL) support by P2H

Usage of excess electrical energy from Renewable Energy sources can be realized e.g. by Power-to-Heat (P2H), Power-to-Gas (PtG) or Power-to-Liquid (PtL).

P2H can react very fast, is small and has a favorable price. PtG and PtL ramp-up is long, their unit size is big and construction time is long. So the systems are not competing but complementing each other.

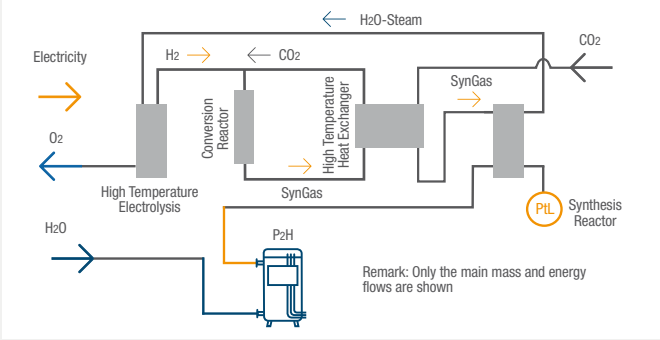
In a PtL factory, water and carbon dioxide from air or a producer (e.g. food or cement industry) get processed; the end product is methanol. It can be upgraded to gasoline for powering means for long distance transport like ships or to airplane fuel.

During ramp-up of the PtL process, P2H is needed for preheating the process water. P2H will start converting the excess electrical energy within a second. The PtL electrolytical vessel will take over parts of this electrical excess energy step-by-step in a material-protecting manner as soon as it gets on temperature. The P2H heater can later also be used for converting voltage peaks or additional short-term excess energy to thermal energy.

PtL is a sales opportunity for plant builders in the oil refining industry, producing fuel from almost cost-free excess renewable energy – which otherwise would have been left unused. While private cars will increasingly be powered electrically, long distance transport on ships and airplanes will depend on liquid fuel for decades.

The amortization of the PtL/P2H system will usually be after about 15.000 operation hours (2+ years).

Planners, developers and system integrators are welcome to contact us at ELWA for more details.



Pict. 1: PtL with P2H support overview chart

Pict. 2: PtL factory 6MW / 200 l/h

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-2 28-660
fax +49-8141-2 28-6610

email sales@elwa.com
web www.elwa.com
www.power2he.at

ELWA

Power-to-Heat

Case Study: GenSet optimization

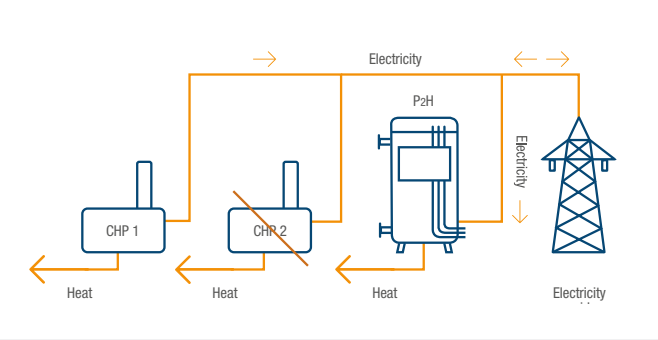
Electricity generation with GenSets in Offgrid applications or with CHP when grid-connected has become widespread. Flexibility and independence are the key decision facts for the investment. On the other hand, operating costs (OpEx) depend mainly on the fossil energy market and thus are unpredictable.

ELWA P2H systems have been designed to bring down OpEx. Renewable energies as the cheapest free scalable energy source can be perfectly combined with GenSets/ CHPs and ELWA P2H systems.

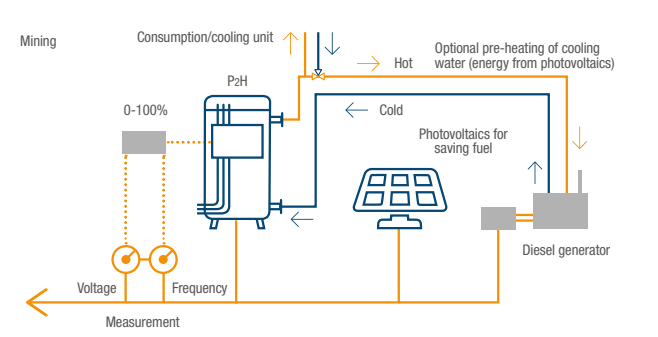
Grid-connected CHP or GenSet systems (Pict. 1) supporting the grid don't have to start the next generator in a cascaded array if short-time power or heat demand is higher. Less operating hours extend maintenance intervals, avoiding several engines running in partial load saves fuel and material stress. At very low electricity market prices, excess renewable energy from the grid or electrical power from the CHP is supporting heat production. With short-time electricity demand, the P2H system can reduce its power automatically in order to avoid the start of the next generator in the cascade. Installed generator power can be higher than the grid connection lines allow, especially with frequent peak heat demand.

Offgrid systems (Pict. 2) have to run at a minimum load for frequency stabilization and lower material stress. Unlike dump loads, the ELWA P2H system can vary its power infinitely in a split second, helping to stabilize frequency and voltage level when switching on powerful loads (inrush currents). Different to battery systems, grid pertubations will be lowered and the design rated power of the GenSet will not be reduced. OpEx-saving PV can easier be integrated. Additionally, PV can keep GenSet cooling water temperature at quick-start level in off-grid emergency power stations.

Planners, developers and system integrators are welcome to contact us at ELWA for more details.



Pict. 1: grid-connected: avoiding cascade start



Pict. 2: offgrid: stabilization

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-2 28-660
fax +49-8141-2 28-6610

email sales@elwa.com
web www.elwa.com
www.power2he.at

ELWA

Preheater KVEc

The compact engine preheater

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-22866-0
fax +49-8141-22866-10

email sales@elwa.com
web www.elwa.com

Description

The ultracompact KVEc heaters offer highly effective heating power for processes with water or similar media. Important development targets were minimised footprint and perfect cost control without compromise on quality and reliability and serviceability.

Design
The KVEc series is based on our renowned KVE series. We use high-quality centrifugal pumps (wet runners and dry runners). All components can be exchanged with standard tools.

Electrics
Due to the flexible design, the units can be adapted to any operating voltage between 230 VAC and 690 VAC. The compact dimensions require external installation of the main fuses.

Operating pressure
10 bar in standard design/16 bar in HP design

Operating temperature
Max. 95/100 °C

Heat transfer
Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm^2) is approximately 8 W/cm^2.

Material
All components in contact with the medium can be made of material suited to the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)
The compact control box contains contactor for the heater, transformer and fuses for the pump and the temperature controller and temperature safety limiter. The basic version is designed for remote operation without local switches and indicators.

Options
> electronic temperature controller (with display)
> safety valve
> non-return valve
> local operation with switch and indicator lamp
> coupled dry runner pump
> thermal insulation (softshell)

Typical applications
The series KVEc heaters are the perfect choice for preheating the cooling water circuits of small and mid-sized diesel engines. Further possible areas of application: Heat source for industrial processes/building heating (booster/legionella cycle).

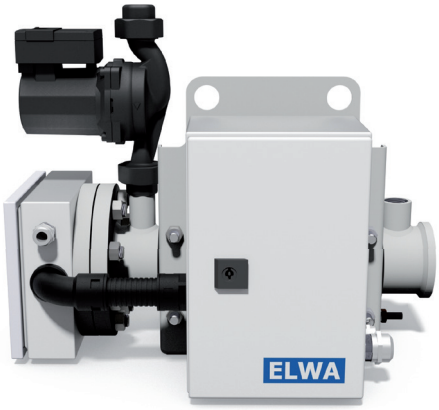
Safety
All units are equipped with built in safety temperature limiters (STB). Optional additional safety device: safety valves.

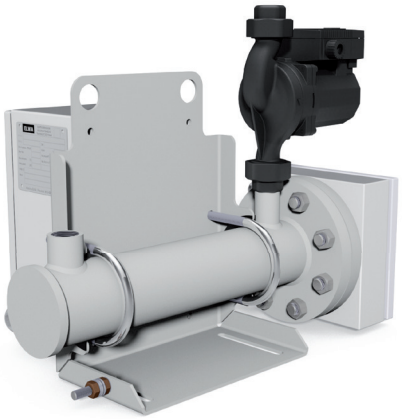
Thermal insulation
Optional softshell insulation.

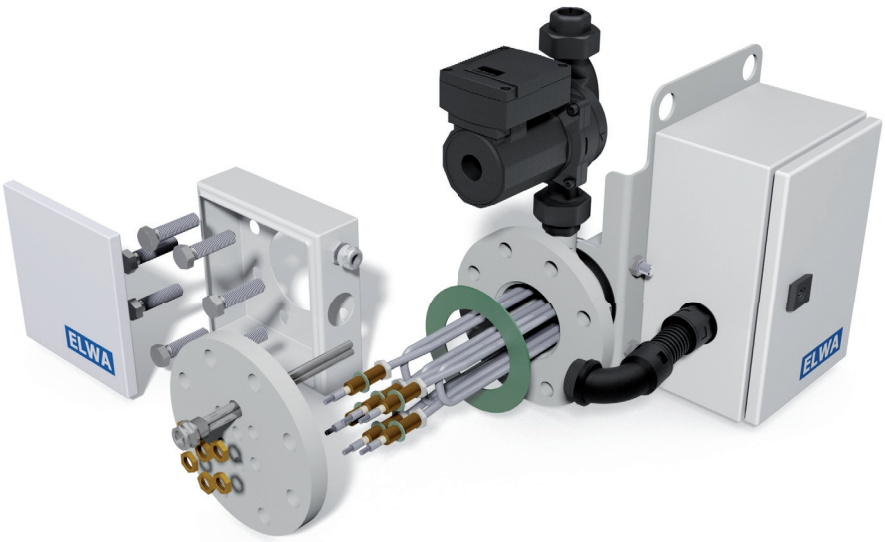
Painting
Heavy duty industrial painting with 2K structured PUR paint

Process connections
Standard: threaded connection 1” (inner thread)

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, MRS, others on request



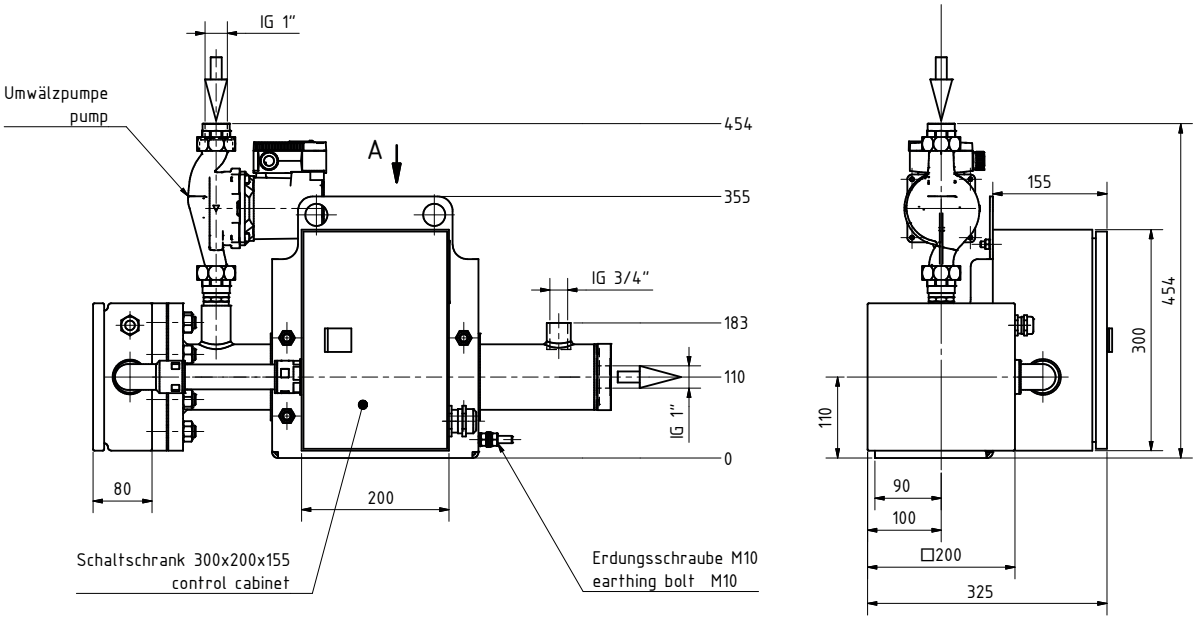


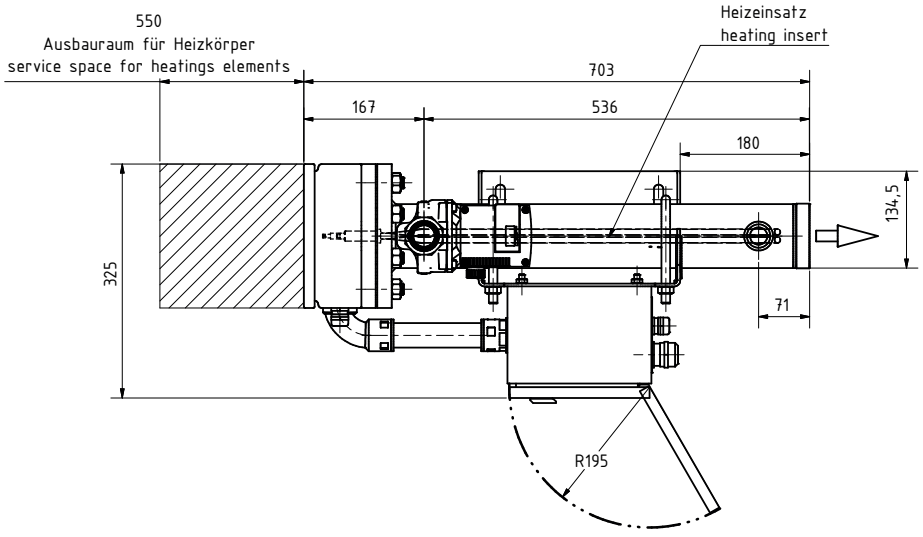


Overview table

Type	power/operating voltage	Ph.
KVEc-3	2,5 kW @ 230 V ...3 kW @ 240 V	1
KVEc-5	3,1 kW @ 400 V ...4,5 kW @ 480 V	3
KVEc-9	6,3 kW @ 400 V ...9,0 kW @ 480 V	3
KVEc-13	9,0 kW @ 400 V ...12,9 kW @ 480 V	3
KVEc-15	12,1 kW @ 400 V ...14,7 kW @ 480 V	3

technical data	
pump	2 m³/h @ 3 mWs
operating pressure	Max 6 bar
protection class	IP 56 (IEC 60529)





Please note that technical data, dimension and equipment may vary.

Service Hotline

+ 49 (0) 8141 – 22866-980

ELWA

Preheater KVE/KVES

The reference hot water circuits

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-2 28 66-0
fax +49-8141-2 28 66-10

email sales@elwa.com
web www.elwa.com

Description

The series KVE/KVES heaters offer highly effective heating power for processes with water or similar media. The heating elements and the pumps can be perfectly adapted to the customers application.

Design

The KVE/KVES series is based on our approved 4600 WR series flow heater. With the mounted control cabinet and the integrated pumps we offer configurable units which can be used for many applications. We use high-quality centrifugal pumps. The heating elements can be exchanged with standard tools.

Electrics

Due to the flexible design, the units can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure

10 bar in standard design/16 bar in HP design

Operating temperature

Max. 95/100 °C

Heat transfer

Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm²) can be precisely adapted to the medium characteristics.
Recommended surface loads:.

3,5 W/cm²	aggressive media (e.g. chlorinated water, bilge water,...)
6,5 W/cm²	potable water, engine cooling water with additives

Material

All components in contact with the medium can be made of material suited to the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)

The KVE/KVES preheating units are delivered with ELWA control cabinets specially designed for the specific applications. The heating steps can be controlled either with mechanical or electronic temperature controllers. The power is then switched with conventional contactors, solid state relays or thyristor controllers. Please see data sheets for ELWA ETU/ELWA SPC/ELWA STC.

Typical applications

The series KVE/KVES heaters are the perfect choice for preheating the cooling water circuits of large diesel engines. Further possible areas of application: Heat source for industrial processes/building heating (booster/legionella cycle).

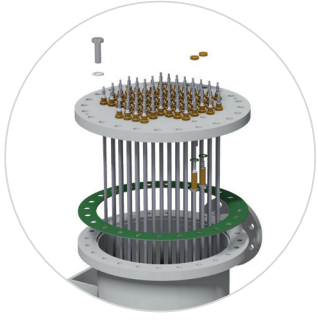
Safety
All units are equipped with built in safety temperature limiters (STB). Optional additional safety devices: flow switch, temperature limiter (self reset), PT-100 sensors and safety valves.

Thermal insulation
The heaters come with an efficient thermal insulation made of rockwool and galvanised steel sheet cover. The cover is also available made of stainless steel (polished upon request).

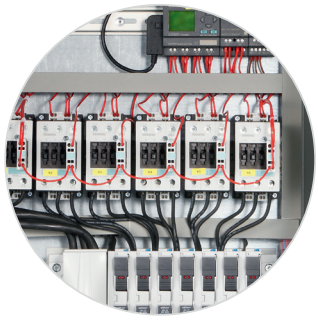
Painting
Heavy duty industrial painting with 2K structured PUR paint

Process connections
Standard: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16
Optional: Triclamp or threaded connections

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, TÜV, MRS, others on request



Each heating element can be exchanged



Intelligent controls

Heavy duty centrifugal pump

Overview table

			Cooling Water				
			flow (m³/h)		pressure (mWC)		Flanges (DN)
Type	Heating (kW)	Steps (kW)	50 Hz	60 Hz	50 Hz	60 Hz	
KVE-7,5	7,5	1x7,5	10	10	8	10	40
KVE-12	12	2x6	10	10	8	10	40
KVE-15	15	2x7,5	10	10	8	10	40
KVE-18	18	2x9	10	10	8	10	40
KVE-22,5	22,5	7,5+15	10	15	8	10	40
KVE-27	27	9+18	10	15	8	10	40
KVE-30	30	2x15	10	15	8	10	40
KVE-36	36	2x18	10	15	8	10	40
KVE-45	45	2x22,5	10	15	8	10	40
KVE-54	54	2x27	10	15	8	10	40
KVE-72	72	18+27+27	12,5	15	10	10	40
KVE-81	81	3x27	12,5	15	10	10	40
KVE-108	108	4x27	22	22	10	10	40

			Cooling Water				
			flow (m³/h)		pressure (mWC)		Flanges (DN)
Type	Heating (kW)	Steps (kW)	50 Hz	60 Hz	50 Hz	60 Hz	
KVES-108	108	4x27	22	22	9	11	50
KVES-135	135	3x45	22	22	9	11	50
KVES-147	147	3x34+1x45	22	22	9	11	50
KVES-169	169	1x34+3x45	29	29	10	11	50
KVES-203	203	2x34+3x45	29	29	10	11	65
KVES-214	214	1x34+4x45	29	29	10	11	65
KVES-247	247	3x45+2x56	34	35	10	11,7	65
KVES-270	270	1x45+4x56	34	35	10	11,7	65

The table shows recommended pump data. Please note that we can use smaller/larger pumps on request.

Complementary products

ELWA SPC

smart.power.control
Control box with heating steps and step-less control of a part of the heating power with our intelligent ELWA SPC control unit and solid state relays

ELWA STC

smart.thyristor.control
Control box with fully step-less regulation of the heating capacity using ELWA STC control

Service Hotline
+ 49 (0) 8141 – 22866-980

ELWA

Preheater KVD/KVT

Efficient preheating with steam or thermal oil

Service Hotline

+ 49 (0) 8141 – 22866-980

ELWA

product data sheet KVD/KVT

Description

The series KVD/KVT heaters offer highly effective heating power for processes with water or similar media. The heat exchangers and the pumps can be perfectly adapted to the customer`s application.

Design

The KVD/KVT series is based on high quality shell and tube heat exchangers. With the mounted control cabinet and the integrated pumps we offer configurable units which can be used for many applications. We use high-quality centrifugal pumps. The tube bundles can be exchanged with standard tools.

Electrics

The units can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure

10 bar

Operating temperature

Water: 95/100 °C/thermal oil: max. 190 °C/steam: max. 170 °C

Heat transfer

The heated medium (water) is pumped through the tubes of the heat exchanger while the heating medium – steam or thermal oil – flows through the shell.

Temperature control

The heating power is controlled with piston operated control valves (pressurized air). The pilot (solenoid) valve is controlled by the electronic temperature controller. The motor starter with stop delay, and the temperature controller with digital temperature display are integrated in the mounted control box.

Typical applications

The series KVD/KVT heaters are the perfect choice for preheating the cooling water circuits of large diesel engines. Further possible area of application: Heat source for industrial processes.

Safety

All units are equipped with a temperature safety cut-out. Additionally the flow of the heated medium through the heat exchanger is monitored with a minimum flow switch. In case of a pump failure or excess temperature, the control will shut of the flow off the heating medium.

Thermal insulation

The heaters come with an efficient thermal insulation made of rock wool and galvanised steel sheet cover.
For thermal insulation of the pipes, softshell insulations are available upon request.

Painting
Heavy duty industrial painting with 2K structured PUR paint

Process connections
Standard: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, MRS, others on request

ELWA

product data sheet KVD/KVT

Overview table

STEAM

		Cooling water		Steam	Connections (DN)		
Steam 50 Hz	**Heating (max)**	(m^3/h)	(mWC)	(kg/h)	CW	steam	cond
KVD8-27	27 kW	10	8,0	53	40	15	15
KVD8-48	48 kW	10	8,0	85	40	20	15
KVD8-72	72 kW	12,5	10,0	127	40	20	20
KVD8-110	110 kW	22	10,0	194	50	25	20
KVD8-150	150 kW	22	10,0	267	50	32	20
KVD8-210	210 kW	34	10,0	368	65	40	20
KVD8-270	270 kW	34	10,0	473	65	40	25

		Cooling water		Steam	Connections (DN)		
Steam 60 Hz	**Heating (max)**	(m^3/h)	(mWC)	(kg/h)	CW	steam	cond
KVD8-27	27 kW	15	10,0	53	40	15	15
KVD8-48	48 kW	15	10,0	85	40	20	15
KVD8-72	72 kW	15	10,0	127	40	20	20
KVD8-110	110 kW	20	11,8	194	50	25	20
KVD8-150	150 kW	20	11,8	267	50	32	20
KVD8-210	210 kW	35	11,7	368	65	40	20
KVD8-270	270 kW	35	11,7	473	65	40	25

THERMAL OIL

		Cooling water		Thermal oil	Connections (DN)	
Th. oil 50 Hz	**Heating (max)**	(m^3/h)	(mWC)	(l/h)	CW	Th.oil
KVT8-27	27 kW	10	8,0	1720	40	15
KVT8-48	48 kW	10	8,0	3000	40	20
KVT8-72	72 kW	12,5	10,0	4600	40	25
KVT8-110	110 kW	22	10,0	7000	50	32
KVT8-190	190 kW	34	10,0	12100	65	40
KVT8-270	270 kW	34	10,0	17200	65	50

		Cooling water		Thermal oil	Connections (DN)	
Th. oil 60 Hz	**Heating (max)**	(m^3/h)	(mWC)	(l/h)	CW	Th.oil
KVT8-27	27 kW	15	10,0	1720	40	15
KVT8-48	48 kW	15	10,0	3060	40	20
KVT8-72	72 kW	15	10,0	4600	40	25
KVT8-110	110 kW	20	11,8	7000	50	32
KVT8-190	190 kW	35	11,7	12100	65	40
KVT8-270	270 kW	35	11,7	17200	65	50

The table shows recommended pump data. Please note that we can use smaller/larger pumps on request.

ELWA

Flow heater ERH 4700

High tech heaters for oil/emulsion

Service Hotline

+ 49 (0) 8141 – 22866-980

ELWA

product data sheet ERH 4700

Description

Since their introduction to the market, the heaters of the 4700 series are the reference when it comes to perfect temperature control, heat transfer and flexibility in combination with a minimized footprint.

Design

The series 4700 heaters are a modular design. Similar to a conventional plate type heat exchanger, the max heating power can be adjusted by altering the number of plates. The heater stack consists of fluid filled pockets and electric heating elements. Since we cannot only alter the number of plates but also the max power of the heating elements, we can configure the perfect heater for any fluid. Due to the reduced volume in the heater we achieve short resting times and high control accuracy.

Electrics

Due to the flexible design, the heating elements can be adapted to almost any operating voltage between 220 VAC and 690 VAC.

Operating pressure

6 bar in standard design

Operating temperature

Max. 100 °C

Heat transfer

Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm^2) can be precisely adapted to the medium characteristics.
Recommended surface loads:

0,8 W/cm^2	lube oil/low flow rate of medium
1,1 W/cm^2	high viscosity heavy fuel oils and average flow rate of medium
1,5 W/cm^2	marine diesel fuels, light diesel fuels and high flow rate of medium

Material

All parts in contact with the heated fluid are made of stainless steel grade 1.4301 or 1.4305 making it possible to use the heater for aggressive fluids.

Controls (ELWA)

The 4700 heaters come with specially designed control boxes. The complete heating power is switched with solid state relays. The basic configuration of the controls already achieve excellent control quality. For operation in small grids or when perfect temperature control is of utmost importance, we use the optional SPC (smart.power.control) unit. Due to the fast switching cycles and intelligent control, the stress on the power supply is reduced significantly and the heating power is controlled virtually stepless. See product data sheet ELWA ETU/ELWA SPC.

Typical applications

The series 4700 heaters are the perfect choice for heating fluids like fuel oils (MGO/HFO), lubrication oils or emulsions.

Safety
All heaters are equipped with built in safety temperature limiters (STB) and an optional safety valve.

Thermal insulation
The heaters come with an efficient thermal insulation made of rockwool and galvanised steel sheet cover. The cover is also available made of stainless steel (polished upon request).

Painting
Heavy duty powder coating

Process connections
Standard: 1“ pipe thread (male)
Optional: SAE 1“ flanges

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, MRS, others on request

heating element and fluid pocket

intelligent controls

rear view with connection pipes

Overview table

	Max heating power (at given surface load)		
Typ	**0,7 W/cm²**	**1,1 W/cm²**	**1,5 W/cm²**
4701	1,50 kW	2,25 kW	3,00 kW
4702	3,00 kW	4,5 kW	6,00 kW
4703	4,50 kW	6,75 kW	9,00 kW
4704	6,00 kW	9,00 kW	12,00 kW
4705	7,50 kW	11,25 kW	15,00 kW
4706	9,00 kW	13,50 kW	18,00 kW
4707	10,50 kW	15,75 kW	21,00 kW
4708	12,00 kW	18,00 kW	24,00 kW
4709	13,50 kW	20,25 kW	27,00 kW
4710	15,00 kW	22,50 kW	30,00 kW
4711	16,50 kW	24,75 kW	33,00 kW
4712	18,00 kW	27,00 kW	36,00 kW
4712	19,50 kW	29,25 kW	39,00 kW

Complementary products

ELWA SPC

smart.power.control

Schaltschrank mit Stufenschaltung und stufenloser Regelung einer Teilleistung mit der intelligenten ELWA SPC Steuerung und Solid State Relais

Service Hotline

+ 49 (0) 8141 – 22866-980

ELWA

Flow heater ERH 4600 WR

The reference class for water

ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-22866-0
fax +49-8141-22866-10

email sales@elwa.com
web www.elwa.com

ELWA

product data sheet ERH 4600 WR

Description

The series 4600 WR heaters offer highly effective heating power for processes with water or similar media. The heating elements can be perfectly adapted to the customers application.

Design

The series 4600 WR heaters consist of a welded pressure vessel with an electric heating insert. The heating elements can be exchanged with standard tools. The design of the heating elements ensure excellent thermal reaction time and control accuracy.

Electrics

Due to the flexible design, the heating elements can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure

10 bar in standard design/16 bar in HP design

Operating temperature

Max. 95/100 °C

Heat transfer

Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm²) can be precisely adapted to the medium characteristics.
Recommended surface loads:

3,5 W/cm²	aggressive media (e.g. chlorinated water, bilge water,...)
6,5 W/cm²	potable water, cooling water with additives

Material

All components in contact with the medium can be made of material suited to the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)

The majority of our heaters are delivered with ELWA control cabinets specially designed for the specific applications. The heating steps can be controlled either with mechanical or electronic temperature controllers. The power is then switched with conventional contactors, solid state relays or thyristor controllers. Please see data sheets for ELWA ETU/ELWA SPC/ELWA STC. The control cabinets can either be mounted directly on the heaters or can be installed separately.

Typical applications

The series 4600 WR heaters are the perfect choice for heating water with/without additives, aggressive media or emulsions. Further possible areas of application: pharmaceutical industry/food industry

Safety

All heaters are equipped with built in safety temperature limiters (STB). Optional additional safety devices: flow switch, temperature limiter (self reset), PT-100 sensors and safety valves.

Thermal insulation
The heaters come with an efficient thermal insulation made of rockwool and galvanised steel sheet cover.
The cover is also available made of stainless steel (polished upon request).

Painting
Heavy duty industrial painting with 2K structured PUR paint

Process connections
Standard: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16
Optional: Triclamp or threaded connections
The position of the connections can be adapted on request.

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, TÜV, MRS, others on request

Overview table

					Nozzle size		
Type	**heating power (kW)**		**heating steps (kW)**		**Min**	**Norm**	**Max**
4603WR-V	6	9	1x6	1x9	25	32	40
4606WR-V	12	18	2x6	2x9	25	32	50
4609WR-V	18	27	3x6	3x9	25	32	50
4612WR-V		36		2x18	25	32	80
4620WR-V	24	45	2x12	2x22,5	25	32	80
4624WR		54		3x18	25	32	80
4624WR-V	36	67,5	2x18	3x22,5	25	32	80
4636WR		81		3x27	25	40	80
4636WR-V	54	101	3x18	3x33,8	25	40	80
4648WR-V	72	135	4x18	4x33,8	25	40	100
4660WR-V	90	169	5x18	5x33,8	25	50	100
4672WR-V	108	202,5	6x18	6x33,8	25	50	125
4696WR-V	144	270	8x18	8x33,8	25	65	125
46128WR-V	192	360	8x24	8x45	25	65	150
46152WR-V	228	427,5	18+7 x 30	33,8+7x 56,3	25	65	150
surface load	3,5	6,5	3,5	6,5	W/cm²		

Complementary products

ELWA SPC

smart.power.control
Control box with heating steps and step-less control of a part of the heating power with our intelligent ELWA SPC control unit and solid state relays

ELWA STC

smart.thyristor.control
Control box with fully step-less regulation of the heating capacity using ELWA STC control

Service Hotline
+ 49 (0) 8141 – 22866-980

ELWA

Flow heater ERH 4600 RF

The reference class for oil/emulsion

Service Hotline

+ 49 (0) 8141 – 22866-980

ELWA

product data sheet ERH 4600 RF

Description

The series 4600 heaters feature design characteristics which make these units unrivalled on the market. The high variability of the design allows a perfect adaption to any process conditions. Thousands of these heaters are in service on ships, in power stations or industrial applications all over the world.

Design

The series 4600 heaters consist of a welded pressure vessel with an electric heating insert. The heating elements are positioned in protection tubes and are not in direct contact with the medium. They can be exchanged **without draining and opening** the pressure vessel. The design of the heating elements ensure excellent thermal reaction time and control accuracy.

Electrics

Due to the flexible design, the heating elements can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure

6 bar in standard design/10 bar in HP design

Operating temperature

Max. 150 °C

Heat transfer

Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm²) can be precisely adapted to the medium characteristics. Recommended surface loads:

0,8 W/cm²	lube oil/low flow rate of medium
1,1 W/cm²	high viscosity heavy fuel oils and average flow rate of medium
1,4 W/cm²	marine diesel fuels, light diesel fuels and high flow rate of medium

Material

The pressure vessel and the heating insert with the protection tubes for the heating elements can be made of any material to suit the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)

The majority of our heaters are delivered with ELWA control cabinets specially designed for the specific applications. The heating steps can be controlled either with mechanical or electronic temperature controllers. The power is then switched with conventional contactors, solid state relays or thyristor controllers. Please see data sheets for ELWA ETU/ELWA SPC/ELWA STC. The control cabinets can either be mounted directly on the heaters or can be installed separately.

Typical applications

The series 4600 heaters are the perfect choice for heating fluids like fuel oils (MGO/HFO), lubrication oils or emulsions.

Safety
All heaters are equipped with built in safety temperature limiters (STB). Optional additional safety devices: flow switch, temperature limiter (self reset), PT-100 sensors and safety valves.

Thermal insulation
The heaters come with an efficient thermal insulation made of rockwool and galvanised steel sheet cover.
The cover is also available made of stainless steel (polished upon request).

Painting
Heavy duty industrial painting with 2K structured PUR paint

Process connections
Standard: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16
Optional: Triclamp or threaded connections
The position of the connections can be adapted on request.

Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, TÜV, MRS, others on request

Overview table

							Nozzle size		
Type	**heating power (kW)**			**heating steps (kW)**			**Min**	**Norm**	**Max**
4603RF-V	3	4	5	1x3	1x4	1x5	25	32	40
4606RF-V	6	8	10	2x3	2x4	2x5	25	32	50
4609RF-V	9	12	15	3x3	3x4	3x5	25	32	50
4612RF-V	12	16	20	2x6	2x8	2x10	25	32	80
4620RF-V	16	20	24	2x8	2x10	2x12	25	32	80
4624RF	18	24	30	3x6	3x8	3x10	25	32	80
4624RF-V	24	30	36	3x8	3x10	3x12	25	32	80
4636RF	27	36	45	3x9	3x12	3x15	25	40	80
4636RF-V	36	45	54	3x12	3x15	3x18	25	40	80
4648RF-V	48	60	72	4x12	4x15	4x18	25	40	100
4660RF-V	60	75	90	5x12	5x15	5x18	25	50	100
4672RF-V	72	90	108	6x12	6x15	6x18	25	50	125
4696RF-V	96	120	144	8x12	8x15	8x18	25	65	125
46128RF-V	128	160	192	8x16	8x20	8x24	25	65	150
46152RF-V	152	190	228	12+7x20	15+7x25	18+7x30	25	65	150
surface load	0,8	1,1	1,4	0,8	1,1	1,4	W/cm²		

Complementary products

ELWA SPC

smart.power.control
Control box with heating steps and step-less control of a part of the heating power with our intelligent ELWA SPC control unit and solid state relays

ELWA STC

smart.thyristor.control
Control box with fully step-less regulation of the heating capacity using ELWA STC control

ELWA EVM

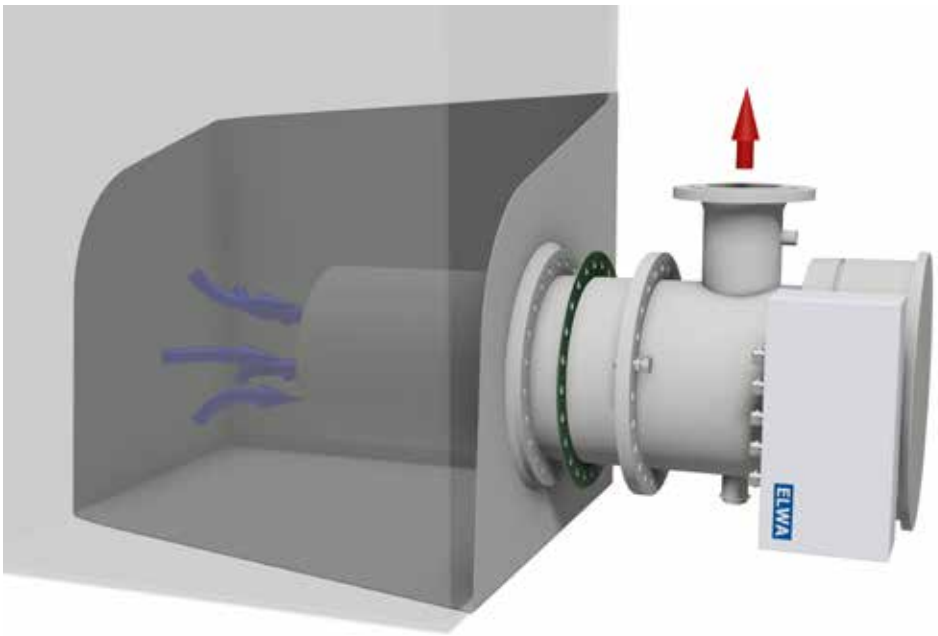
electronic.viscosity.measurement
Inline unit to measure the viscosity of the heated fluid

Service Hotline
+ 49 (0) 8141 – 22866-980

ELWA

Tank heater ERH 800 RF

The reference class for oil/emulsion



ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-22866-0
fax +49-8141-22866-10

email sales@elwa.com
web www.elwa.com

ELWA

product data sheet ERH 800 RF

Description

The series 800 RF heating inserts feature design characteristics which make these units unrivalled on the market. The high variability of the design allows a perfect adaption to any process conditions. There is no better solution to heat up tanks.

Design

The series 800 RF heaters consist of flange with welded-in protection tubes. The heating elements are positioned in the protection tubes and are not in direct contact with the medium. They can be exchanged **without draining** and opening the tank. The design of the RF heating elements ensure excellent thermal reaction time and control accuracy.

Installation

The series 800 RF heating inserts are normally installed in horizontal position in the lower area of the tank. The counter flanges for welding to the tank wall are supplied with the heaters.

Accessories

In case the tank is not to be heated completely and only the extraction volume is to be heated to the desired process temperature, the 800 RF series can be upgraded with the optional insertion vessel Type 400 to become an integrated continuous flow heater.

Electrics

Due to the flexible design, the heating elements can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure

6 bar in standard design/10 bar in HP design

Operating temperature

Max. 150 °C

Heat transfer

Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm2) can be precisely adapted to the medium characteristics.
Recommended surface loads:

0,8 W/cm²	lube oil and other temperature-critical fluids
1,1 W/cm²	high viscosity heavy fuel oils
1,4 W/cm²	marine diesel fuels, light diesel fuels

Material

All components in contact with the medium can be made of any material to suit the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)

The majority of our heaters are delivered with ELWA control cabinets specially designed for the specific applications. The heating steps can be controlled either with mechanical or electronic temperature controllers. The power is then switched with conventional contactors, solid state relays or thyristor controllers. Please see data sheets for ELWA ETU/ELWA SPC/ELWA STC. The control cabinets can either be mounted directly on the heaters or can be installed separately.

Typical applications

The heating insert heaters are the perfect choice for heating fluids like fuel oils (MGO/HFO), lubrication oils or emulsions.

Safety

All heaters are equipped with built in safety temperature limiters (STB). Optional additional safety devices: flow switch, temperature limiter (self reset), PT-100 sensors and safety valves.

Painting

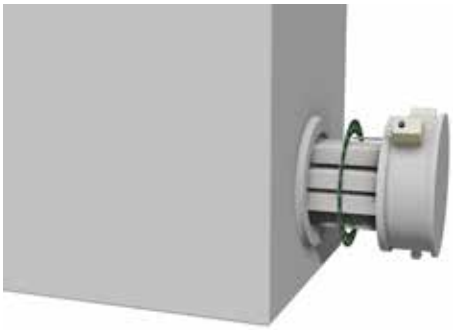
Heavy duty industrial painting with 2K structured PUR paint

Process connections

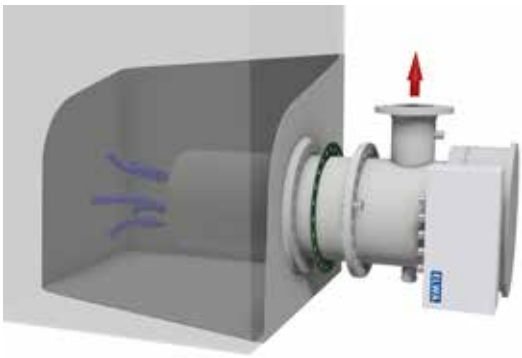
Insertion vessel Type 400: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16
The position of the connection can be adapted on request.

Classifications

ABS, BV, DNV, CCS, GL, LRS, RINA, TÜV, MRS, others on request



Heater type 800 RF mounted in tank



Heater with optional vessel type 400 becomes an integrated flow heater

Overview table

							Nozzle size of optional vessel 400		
Type	**heating power (kW)**			**heating steps (kW)**			**Min**	**Norm**	**Max**
803RF-V	3	4	5	1x3	1x4	1x5	25	32	40
806RF-V	6	8	10	2x3	2x4	2x5	25	32	50
809RF-V	9	12	15	3x3	3x4	3x5	25	32	50
812RF-V	12	16	20	2x6	2x8	2x10	25	32	80
820RF-V	16	20	24	2x8	2x10	2x12	25	32	80
824RF	18	24	30	3x6	3x8	3x10	25	32	80
824RF-V	24	30	36	3x8	3x10	3x12	25	32	80
836RF	27	36	45	3x9	3x12	3x15	25	40	80
836RF-V	36	45	54	3x12	3x15	3x18	25	40	80
848RF-V	48	60	72	4x12	4x15	4x18	25	40	100
860RF-V	60	75	90	5x12	5x15	5x18	25	50	100
872RF-V	72	90	108	6x12	6x15	6x18	25	50	125
896RF-V	96	120	144	8x12	8x15	8x18	25	65	125
8128RF-V	128	160	192	8x16	8x20	8x24	25	65	150
8152RF-V	152	190	228	12+7x20	15+7x25	18+7x30	25	65	150
surface load	0,8	1,1	1,4	0,8	1,1	1,4	W/cm²		

Complementary products

ELWA SPC

smart.power.control
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ELWA STC

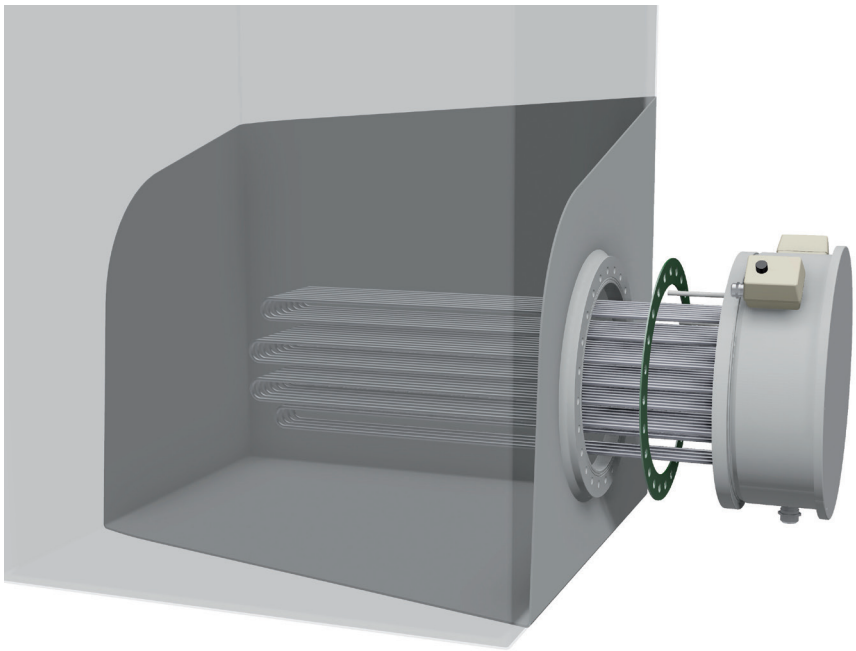
smart.thyristor.control
Control box with fully step-less regulation of the heating capacity using ELWA STC control

Service Hotline
+ 49 (0) 8141 – 22866-980

ELWA

Tank heater ERH 800 WR

The reference class for water



ELWA Elektro-Wärme GmbH & Co. KG
Frauenstraße 26
D-82216 Maisach

tel +49-8141-22866-0
fax +49-8141-22866-10

email sales@elwa.com
web www.elwa.com

Description

The series 800 WR heating inserts feature design characteristics which make these units unrivalled on the market. The high variability of the design allows a perfect adaption to any process conditions. There is no better solution to heat up tanks.

Design
The series 800 WR heaters consist of a flange with bolted in heating elements. The heating elements can be exchanged with standard tools. The design of the heating elements ensure excellent thermal reaction time and control accuracy.

Installation
The series 800 WR heating inserts are normally installed in horizontal position in the lower area of the tank. The counter flanges for welding to the tank wall are supplied with the heaters.

Accessories
In case the tank is not to be heated completely and only the extraction volume is to be heated to the desired process temperature, the 800 WR series can be upgraded with the optional insert vessel Type 400 to become an integrated continuous flow heater.

Electrics
Due to the flexible design, the heating elements can be adapted to any operating voltage between 230 VAC and 690 VAC.

Operating pressure
10 bar in standard design/16 bar in HP design

Operating temperature
Max. 150 °C

Heat transfer
Due to the perfect hydraulic flow around the heating elements, the medium is gently heated to the specified temperature. The surface load (W/cm²) can be precisely adapted to the medium characteristics.
Recommended surface loads:

3,5 W/cm²	aggressive media (e.g. chlorinated water, bilge water,...)
6,5 W/cm²	potable water, cooling water with additives

Material
All components in contact with the medium can be made of any material to suit the application. By standard and with short delivery times: P265GH (mild steel) and 1.4571 (stainless steel). Other materials are available on request.

Controls (ELWA)
The majority of our heaters are delivered with ELWA control cabinets specially designed for the specific applications. The heating steps can be controlled either with mechanical or electronic temperature controllers. The power is then switched with conventional contactors, solid state relays or thyristor controllers. Please see data sheets for ELWA ETU/ELWA SPC/ELWA STC.

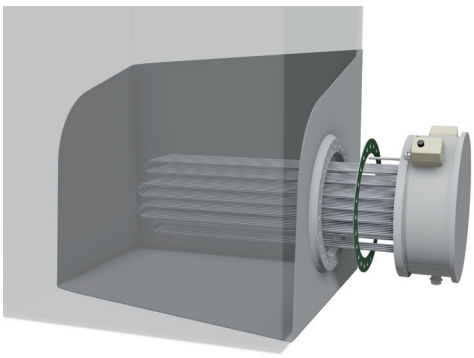
Typical applications
The series 800 WR heaters are the perfect choice for heating water with/without additives, aggressive media or emulsions.

Safety
All heaters are equipped with built in safety temperature limiters (STB). Optional additional safety devices: flow switch, temperature limiter (self reset), PT-100 sensors and safety valves.

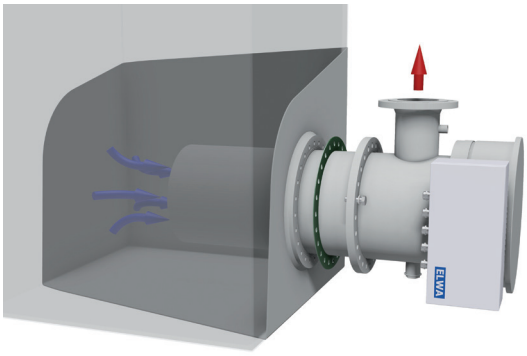
Painting
Heavy duty industrial painting with 2K structured PUR paint.

Process connections
Insertion vessel Type 400: Flanges according to DIN EN 1092-1/11B1/DN15-DN250/PN16
The connection diameter can be adapted on request.

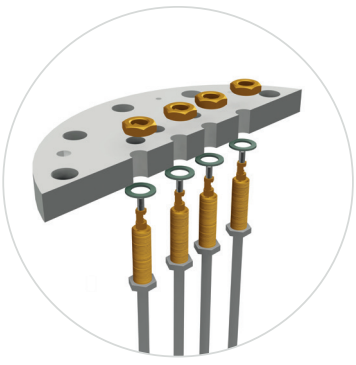
Classifications
ABS, BV, DNV, CCS, GL, LRS, RINA, TÜV, MRS, others on request



Heater 800 WR mounted in tank



Heater 800 WR with optional insertion vessel
makes an integrated flow heater



Overview table

					Nozzle size optional 400 vessel		
Type	**heating power (kW)**		**heating steps (kW)**		**Min**	**Norm**	**Max**
803WR-V	6	9	1x6	1x9	25	32	40
806WR-V	12	18	2x6	2x9	25	32	50
809WR-V	18	27	3x6	3x9	25	32	50
812WR-V		36		2x18	25	32	80
820WR-V	24	45	2x12	2x22,5	25	32	80
824WR		54		3x18	25	32	80
824WR-V	36	67,5	2x18	3x22,5	25	32	80
836WR		81		3x27	25	40	80
836WR-V	54	101	3x18	3x33,8	25	40	80
848WR-V	72	135	4x18	4x33,8	25	40	100
860WR-V	90	169	5x18	5x33,8	25	50	100
872WR-V	108	202,5	6x18	6x33,8	25	50	125
896WR-V	144	270	8x18	8x33,8	25	65	125
8128WR-V	192	360	8x24	8x45	25	65	150
8152WR-V	228	427,5	18+7x30	33,8+7x56,3	25	65	150
surface load	3,5	6,5	3,5	6,5	W/cm²		

Complementary products

ELWA SPC **smart.power.control**
Control box with heating steps and step-less control of a part of the heating power with our intelligent ELWA SPC control unit and solid state relays

ELWA STC **smart.thyristor.control**
Control box with fully step-less regulation of the heating capacity using ELWA STC control

Service Hotline
+ 49 (0) 8141 – 22866-980