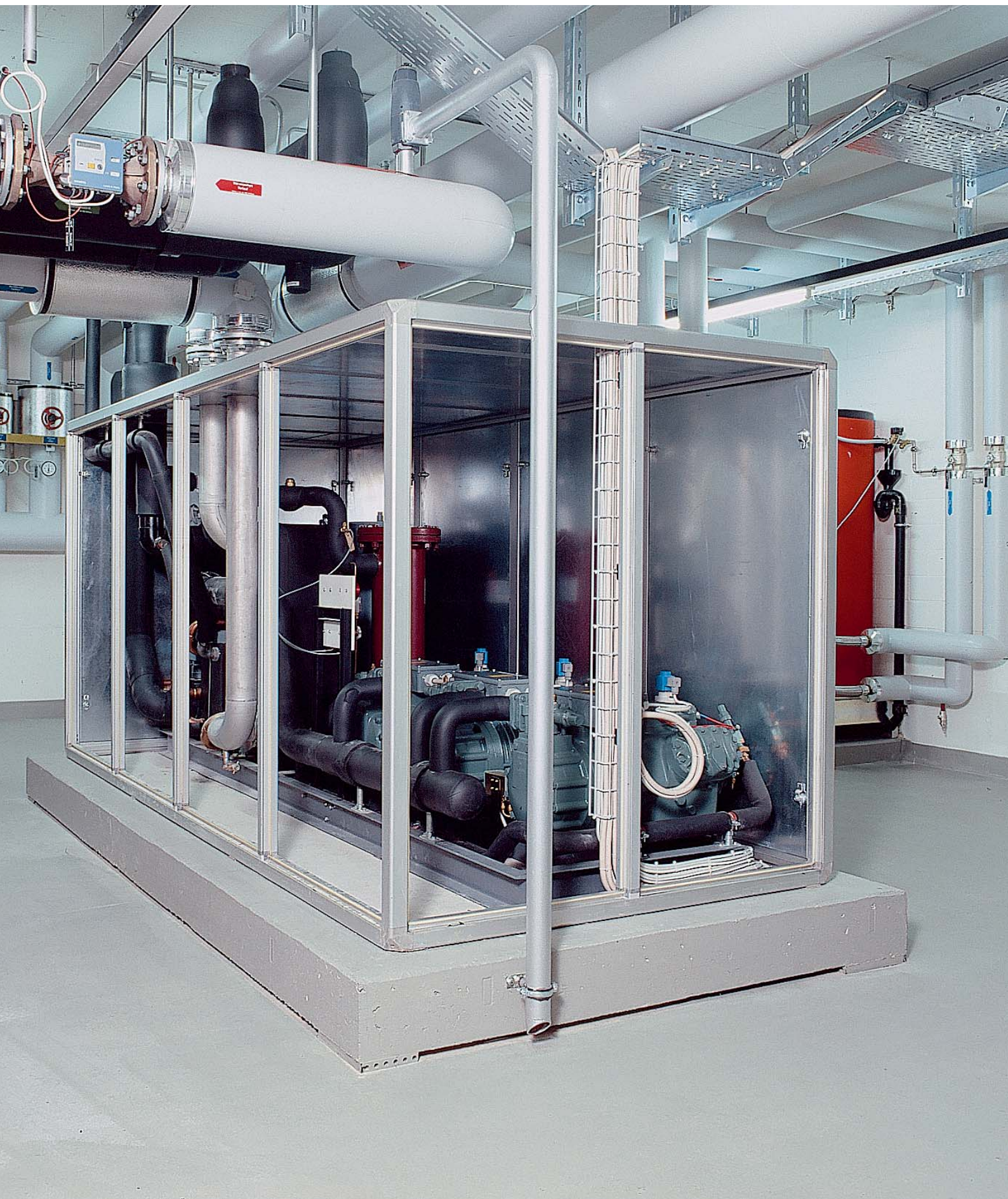


Heat pumps up to 1500 kW









## Heating with renewable energy from the environment – even in higher output ranges

Natural heat is an advanced and cost effective alternative to fossil fuels. It is available free of charge and offers independence from oil and gas.

Heat pumps should be your first choice if your priorities are both to save on heating costs and to generate heat in an environmentally responsible way. After all, the energy a heat pump uses is free and available in unlimited supply from the environment. Only electrical power is required to drive the heat pumps.

This makes you independent of fossil fuels, and in addition you make an active contribution towards reducing CO<sub>2</sub> emissions and protecting the climate. With a heat pump, up to 80 % of the total energy demand from nature is used particularly effectively and without harming the environment. Only 20 to 30 % electrical energy needs to be invested. The principle is as simple as it is ingenious. The solar energy stored in the ambient air, in the ground or in groundwater is used to efficiently heat domestic hot water and heating water.

### Added value through cooling function and dual mode systems

With its high output, a KWT heat pump is designed for larger residential complexes and commercial operations. In addition, with slight adjustments, it can also be used to cool the living space in summer. The idea that a heat pump only suits new build projects has been long disproved. On the contrary, if an existing conventional oil or gas heating system is replaced with a heat pump as part of a modernisation project, there will be significant savings on heating bills and lower emissions at the same time (e.g. compared to a dual mode system). Furthermore, most electricity supply utilities offer green electricity from wind and water power, so you can make another sustainable contribution to the protection of the environment.

### Recovering environmental energy

Various natural sources are suited to heat recovery using a heat pump:

- Groundwater
- Geothermal probes
- Energy piles
- River or lake water
- Air
- Waste water and other waste heat

Not all these heat sources can be used everywhere. It is therefore necessary to consult the relevant authorities before making a decision, and discuss the technical options with KWT.

KWT heat pumps are designed for larger residential complexes and commercial operations (picture: Herrbrugg High School).





# Heat pumps for every application with any type of heat source

With technical expertise, high manufacturing ability and many years of experience, KWT is the heat pump manufacturer of choice for every special application.

KWT works together with its clients to develop solutions that are based on more than 30 years' experience, that will meet practical, everyday needs, and that will overcome any and every challenge. All deadlines and costs arranged can be relied on, with no unexpected surprises.

All systems are designed and built based on our customers' performance definitions. All heat pumps and geothermal probes verify this performance on the test bed and in practice.

## Always the perfect solution

Subject to situation and order, KWT builds tailored heat pump systems for every application: water/water, brine/water and air/water. The output spectrum of the systems ranges from 15 to 1500 kW and can be extended if required, for example with a cascade of several heat pumps.

It is also possible to implement a dual mode heating system. Here, the heat pump provides the standard supply to heat domestic hot water and heating water. To absorb peak loads – for example when there are extremely low temperatures – an oil or gas condensing boiler is automatically switched on in addition.

KWT heat pumps are made to measure and can even be installed under difficult conditions where space is tight. All materials and processes used are certified, and were awarded the ISO 9001 quality standard as long ago as 1996.

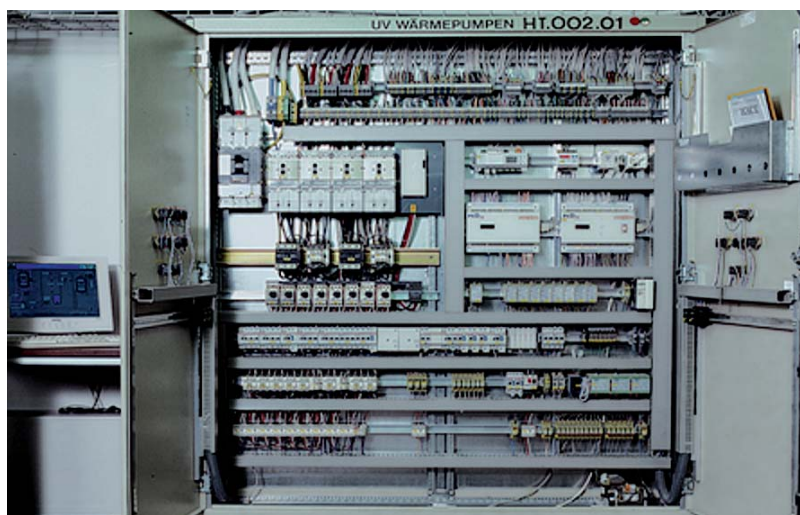
## Intelligent regulating and control concepts

Advanced building services demand integral control solutions that are capable of communicating with other systems. KWT control systems offer the customer maximum functionality, combined with an open system architecture that can communicate with the systems most widely available on the market.

A KWT control system can regulate ventilation and heating assemblies as well as DHW heating, they can switch on energy meters and measure energy usage via M BUS. This is visualised clearly for the user on the display.

KWT control systems are easy to operate and follow a clever and impressive control philosophy.

A KWT heat pump and a Viessmann gas condensing boiler make up a dual mode system to supply the Bonner Werkstätten with heat.





## Brine/water heat pumps



KWT brine/water heat pump with a  
heating output of 290 kW



Constructing piles with  
geothermal probes

# Using heat from the ground with geothermal probes

## A stable and highly durable heat source

KWT brine/water heat pumps – designed with expertise and built with quality.

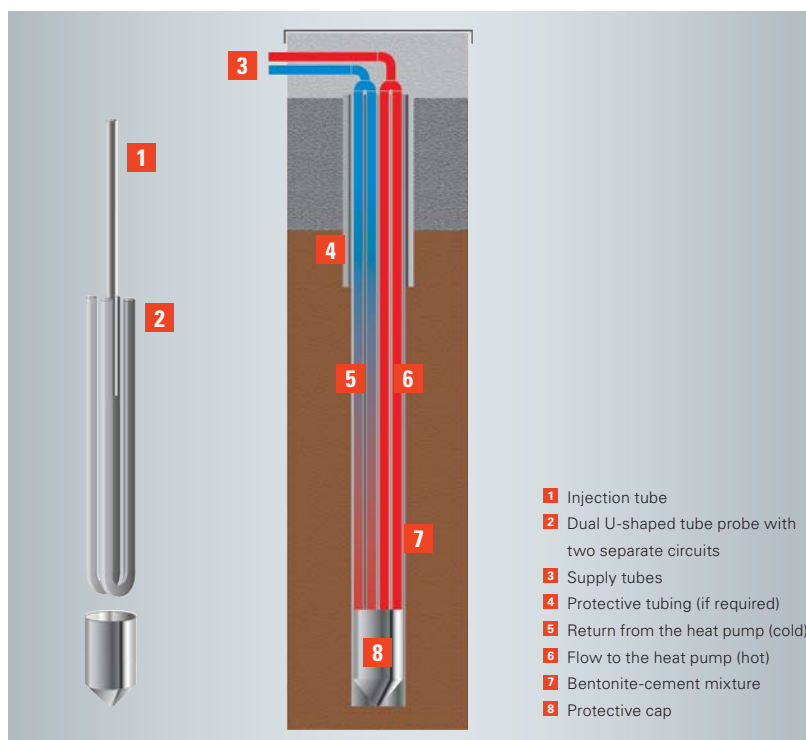
Geothermal probes are durable, maintenance-free heat sources. In conjunction with heat pumps, they provide energy for heating, but are also the ideal heat exchanger for natural cooling. In both cases, KWT brine/water heat pumps utilise the constant temperature in the ground.

### Optimum design

KWT brine/water heat pumps are designed and manufactured in accordance with customer requirements. Economical and cost effective flow temperatures of 35 to 40 °C are ideal for underfloor heating systems. Upon demand they are equipped with the latest series of compressors or multi-stage refrigerant circuits for efficient output modulation. Flow temperatures up to 55 °C are completely acceptable for ventilation systems, and rotary screw compressor are ideal as the core of KWT heat pumps. If technical conditions make flow temperatures up to 75 °C necessary, this can be achieved simply by using semi-hermetic piston compressors.

### DHW heating

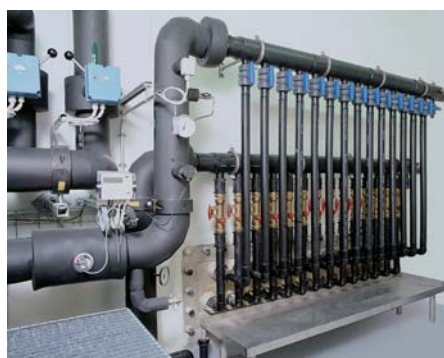
DHW temperatures above 60 °C are often needed. However, especially with larger heat pumps, the demand for DHW heating accounts for the lesser proportion of total output. With multi-stage heat pumps or hot gas decoupling, KWT heat pumps can provide the ideal solution to meet this demand. The use of special safety heat exchangers guarantees global potable water requirements are maintained.



### Geothermal probe

The geothermal probe is composed of two U-shaped tubes. In the middle of this tube bundle there is an injection tube through which a bentonite/cement mixture is pressed after the probe has been installed.

The drill hole is filled from bottom to top. This guarantees the entire probe is connected with the surrounding earth, seals off any water-carrying layers from one another and protects the probe.



Geothermal probe manifold



## Water/water heat pumps



KWT water/water heat pump with a heating output of 500 kW.



KWT water/water  
heat pump



## Groundwater and surface water heat sources for high efficiency

High grade components make KWT water/water heat pumps powerful and reliable in borderline areas.

Groundwater at 8 to 12 °C is a very rich heat source for a heat pump, as the temperature level is high all year round. However, fluctuating water qualities usually require special heat exchangers (evaporators) if you wish to avoid having intermediate circuits.

### Stainless steel tubular evaporators

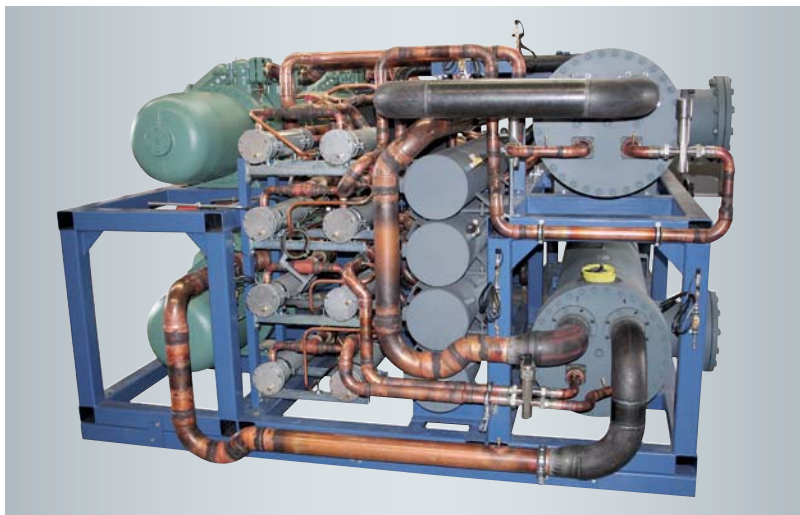
KWT heat pumps for groundwater or surface water are equipped with high grade stainless steel tubular heat exchangers. The benefits are obvious – the evaporator has a large volume and generously sized surface area, so the border regions are not vulnerable to icing up. Light floating parts are simply flushed through with the medium, and aggressive chemical fluids have little destructive effect on the high grade stainless steel.

### Surface water at 4 °C

Surprisingly, below the ice on a lake, the water temperature is 4 °C and we can make use of this anomaly. Though standard water/water heat pumps can no longer utilise this heat, KWT heat pumps are specially designed to do just this, and are equipped with tubular evaporators made of stainless steel 1.4401 and special de-icing circuits. This makes lake or river water at 4 °C usable after all. Especially with particularly high outputs, to use a heat source such as Lake Geneva then becomes a possibility as it can easily provide this required refrigerating capacity.

### Modular delivery

KWT supplies heat pumps that can be divided into sectional modules for modernisation and conversion projects, or employed anywhere where the handling of large heat pumps is not a simple matter. These sectional modules are positioned on site, then connected to one another and commissioned.



Refrigerant circuit of a lake water heat pump with stainless steel tubular heat exchanger.



Depending on the installation conditions, KWT heat pumps can be delivered as modules.

## Waste heat technology



Utilising waste heat from a production process with two KWT heat pumps, each with 400 kW.



## Use waste water and waste heat from production processes as heat sources

KWT special systems are built precisely in accordance with your requirements, they are reliable in operation, and have been used successfully as system components for many years.

Waste water and waste heat from industrial processes contain a great deal of energy, which is only seldom used. KWT has the right expertise to exploit this energy. Even for extremely low outside temperatures of minus 40 °C up to plus 35 °C, there is a matching heat pump in the KWT range.

### DHW heating

Waste water from hotels and leisure complexes is usually at a residual temperature of 25 to 35 °C. At the same time, however, such complexes also require a large amount of fresh hot water.

KWT, with its ideally suited heat pumps is best placed to make use of this waste heat and so is the perfect partner for such projects. Their heat pumps are highly efficient and supply a water temperature of 60 °C.

### Utilising waste heat for heating

Heating doesn't always come first. In many branches of industry, process water has to be cooled. This is often achieved using cooling towers.

A KWT heat pump offers you a more efficient and usually more economical solution – especially when the heat extracted from this process can be re-used elsewhere.

For such application ranges, KWT develops and builds special heat pumps, which have been used successfully as system components for many years.



In the 5-star Ritz Carlton hotel in St Moritz, heat is recovered from waste water.



This FEKA waste water pipe is used as a primary source for DHW heating.



A KWT waste water heat pump with 150 kW output for DHW heating.

## Air/water heat pumps



KWT air/water heat pump



Glycol dry coolers for an  
air/water heat pump



## Air as the heat source; ideal in dual mode systems or to provide cooling

KWT air/water heat pumps for heating and cooling, in conjunction with conventional heat sources, are an economical solution where cooling is required.

Air is readily available as a source of heat. However, even when cooling is required, air can easily absorb the extracted heat. KWT air/water heat pumps make particularly efficient use of air temperatures down to about 5 °C, with which they can cover up to 50 % of the annual heat demand.

### Construction

KWT air/water heat pumps are based on a split design, comprising a dry cooler and a brine/water heat pump. The connection is made simply using hydraulic lines that carry brine. Air/water heat pumps in this output range are operated on a dual mode basis, i.e. above a defined outside temperature, a second heat source provides backup or takes over (e.g. Vitocrossal 300) for more efficient heat generation. This is regulated via the integral control unit.

### Heating and cooling

Air/water solutions from KWT are suitable for heating and cooling. In both cases, the highest level of efficiency is guaranteed thanks to variable speed DC fans. The special design of the air heat exchangers, with gaps twice as wide as in conventional chillers, optimises heat transfer, lowers the pressure drop of the air flow rate, reduces noise and ensures a fast and efficient defrost process.



Glycol re-cooler for air/water heat pumps

### Defrosting not reversible

In the high output ranges, the reversible refrigerant circuit in particular has components such as four-way valves that influence operational reliability and leak protection. KWT heat pumps, however, work with two evaporators and two condensers. Defrosting functions independently of the heat pump using heat from the heating water buffer cylinders or additional supercooling with an energy store. The supercooling circuit is particularly efficient, as this is where environmental energy is used in the defrosting process.

## Engineering, service and maintenance

KWT guarantees the components and assemblies in its products will work seamlessly together – from individual support in designing the system right through to maintenance.



For KWT heat pumps related to specific projects, a 24-hour service is available.

Heat pumps from KWT guarantee efficient and reliable operation. Following installation, KWT engineers or Viessmann service companies commission the system, check its output and reliability, document all the work and tests carried out, and instruct the future operators.

As the only heat pump manufacturer in Switzerland with a complete value chain within its own company, KWT guarantees the components and assemblies in its products will work seamlessly together – from individual support in designing the system right through to maintenance. Outside Switzerland, these services are provided by Viessmann.

### **Service round the clock**

Heat pumps designed for specific projects and other KWT systems can be monitored on a contractual basis from the KWT control centre. Any irregularities can be recognised and remedied in good time via data communication between the system and the control centre or contractual partner.

These services are particularly appropriate for large residential complexes, commercial and industrial buildings, restaurants, hotels, and communal facilities such as schools, swimming pools, etc. This of course includes dual mode systems, such as a combination of heat pump plus oil or gas boiler to cover peak loads.

The results for the user are a high level of serviceability, top quality and maximum flexibility. Other building services can be integrated at any time, providing the perfect finishing touch to the range of services on offer.



## Solutions made to measure in any size

KWT heat pumps start off as individual sections and are built according to the customer's precise specifications.



### Main station, Zurich, Switzerland

Refrigerating capacity installed: 1074 kW

Electrical output: 236 kW

Heating output: 1310 kW

Special features:

Refrigerating unit – air conditioning requirement all year round, waste heat utilisation for heating buildings



### Residential complex in Brissago, Lago Maggiore, Switzerland

Refrigerating capacity installed: 86.4 kW

Electrical output: 33.8 kW

Heating output: 120.2 kW

Special feature:

Heat source – lake water



### Lidl distribution centre, Weinfelden, Switzerland

Refrigerating capacity installed: 434 kW

Electrical output: 201 kW

Heating output: 625 kW

Special feature:

Heat source – refrigeration unit



### Residential complex, Cologne, Germany

Refrigerating capacity installed: 56 kW

Electrical output: 18 kW

Heating output: 74 kW

Special feature:

Dual mode system with gas condensing boiler Vitocrossal 300, 105 kW

## The comprehensive Viessmann product range



## Individual solutions with efficient systems

Futureproof heating systems for all fuel types and applications.

### The comprehensive Viessmann product range

Viessmann sets the technological pace for the heating industry. The comprehensive product range from Viessmann offers individual solutions with efficient systems for all applications and all energy sources. As environmental pioneers, the company has, for decades, been supplying particularly efficient and clean heating systems for oil and gas, as well as solar thermal and PV systems plus heating systems for sustainable fuels and heat pumps.

The comprehensive product range from Viessmann offers top technology and sets new benchmarks. With its high energy efficiency, this range helps to save heating costs and is always the right choice where ecology is concerned.

All Viessmann products meet the requirements of European Directives regarding the reduction of environmental pollution by emissions. Viessmann feels a long-standing responsibility for the best possible environmental preservation and the maximum perseverance of natural resources. To this end, the company employs the best available technology for the generation of heat.



Oil



Gas



Solar



Biomass



Natural heat





Wood combustion technology,  
combined heat & power and biogas

4 – 13,000 kW



Heat pumps for brine,  
water and air

1.5 – 1500 kW

Air conditioning  
technology

System  
components



The comprehensive Viessmann  
product range: individual solutions  
with efficient systems for all energy  
sources and applications

## Individual economical solutions

Viessmann offers the right heating system for any demand – wall mounted and floorstanding, in individual combinations, futureproof and economical. Whether for detached or two-family houses, for large residential buildings, for commerce and industry or for local heating networks. It makes no difference whether the system is intended for modernisation or new build.

Viessmann develops and produces innovative heating systems that demonstrate top quality, energy efficiency and a long service life. Many of these products have become milestones of heating technology.



Detached houses



Apartment buildings



Commerce/industry



Local heating networks

## The company





# The Viessmann Group

For three generations, the Viessmann family business has been committed to generating heat conveniently, economically, with environmental responsibility and in accordance with demand.

With a number of outstanding product developments and problem-solving solutions, Viessmann has created milestones which have frequently made it the trailblazer and trendsetter for the entire industry.

Viessmann's orientation is decidedly international. It maintains 17 factories in Germany, France, Canada, Poland, Hungary, Austria, Switzerland and China, sales organisations in 37 countries, plus 120 branch sales offices worldwide.

## Group member companies

Viessmann is a family business that has financed its growth almost exclusively with its own resources. In more recent times, company takeovers have also contributed to its growth. Today, members of the Viessmann Group include the wood combustion specialists KÖB and Mawera, the heat pump manufacturer KWT, the manufacturer of combined heat and power units ESS, as well as BIOFerm and Schmack as market leaders in biogas systems.

## Skilful workforce

Initial and ongoing training is becoming ever more important. As long ago as the 1960s, the company set itself the task of offering a programme of further training to its skilled contractors.

Today Viessmann maintains a modern information centre at its company head office in Allendorf (Eder), that is second to none. Every year at the Viessmann academy, more than 70,000 contractors bring their knowledge right up-to-date.

## Model project "Efficiency Plus"

As part of a model project, Viessmann has implemented a sustainability concept that links economic actions with ecological and social responsibility. It encompasses the generation and consumption of energy and the resource-efficient production in the Allendorf (Eder) factory. As a result, the amount of fossil fuel consumed at the factory has been cut by 40 % compared to previous levels, and CO<sub>2</sub> emissions have been reduced by a third.

## Responsibility

Viessmann is committed to fulfilling its environmental and social responsibilities. The company employees form a team acting on a global footing. This team is defined by the loyalty, reliability and the responsible actions of each individual. We ensure all our processes are environmentally compatible and encourage the use of renewable forms of energy.

Furthermore we take an interest in economics, art and culture and have for many years engaged in successful international sport sponsorship.



For its commitment to climate protection and efficient use of resources, Viessmann won the German Sustainability Award 2009

# Viessmann Group



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