

# Competent.

The headquarters of KÖB & Schäfer GmbH is located in the town of Wolfurt in Vorarlberg's Rhine Valley, a region in which wood has always been greatly valued as a fuel.

The proverbial Alemannic sense of thriftiness and a distinct striving for quality have always fallen on fruitful soil here for carefully designed products.



PYROMAT ECO  
550 mm



PYROMAT ECO  
1.080 mm



PYROMAT DYN



PYROT



PYRTEC

## Innovations.

KÖB carries out its own research and development and has contributed an important share toward the tremendous progress of furnace firing technology. For outstanding achievements in the field of modern furnace firing technology, the company has received many awards for its innovations in the environmental sphere.

## Programme.

PYROMAT ECO, 35 to 170 kW, thermal storage heating for logs, manual feed.  
PYROMAT DYN, 30 to 90 kW, perfect combination for automatic operations using wood chips, pellets and logs manual feed.  
PYROT, 80 to 540 kW, rotation heating for automatic operations, for pellets, woodchips and shavings.  
PYRTEC, 530 to 1.250 kW, underfeed stoker with automatic operations, for pellets, woodchips and shavings.

## References.

Köb has installed many thousands of systems with satisfied customers all over Europe. Köb specialises in large-scale heating systems and plant construction. Köb has a lot of experience in biomass systems for district heating and pellet systems for local heating networks. A great many references can be given especially for co-operation link-ups with contracting firms.

### Address of the factory:

Köb & Schäfer GmbH  
Flotzbachstrasse 33  
A-6922 Wolfurt  
Tel +43 55 74 / 67 70-0  
Fax +43 55 74 / 65 7 07  
office@koeb-schaefer.com  
www.koeb-schaefer.com

### Sales and service branches:

Great Britain  
3G Energi Ltd  
Charlesfield  
St. Boswells  
Melrose  
TD6 OHH  
Tel +44 1835 82 42 01  
Fax +44 870 706 25 55  
office@3genergi.co.uk

Holland and Belgium  
LVB Energy Systems BV  
NL-4141 BE Leerdam  
Tel +31 3 45 61 97 88  
Fax +31 3 45 61 69 05  
Marc@lvb-wood.nl

Canada – British Columbia /  
Alberta  
Fink Machine Inc.  
CAN Enderby B.C.  
Tel 001 250 838 00 77  
Fax 001 250 838 00 68  
fink@jetstream.net

Other branches are in: France,  
Switzerland, Germany, Italy,  
Austria, Norway, Sweden and  
Japan.

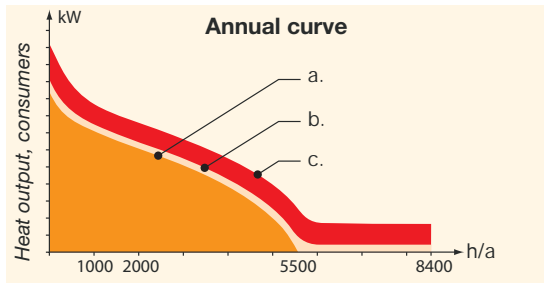
# Grate Firing



# The best price for heat.

Wood as a fuel is the most significant renewable energy world-wide. With sustainable forest management on the one hand and optimisation of your systems on the other, you secure your energy future.

## Heat requirement



Typical case of loading in central Europe

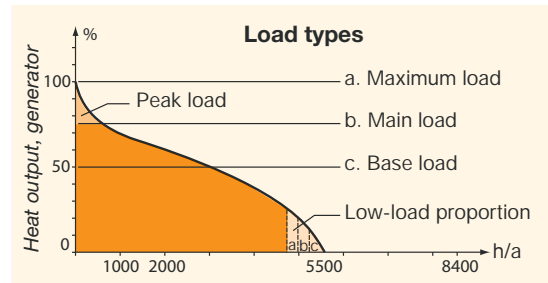
- a) Heating for a single building; heating period: approx. 5,400 h
- b) Heating and hot water for a single building; year-round operation
- c) Heating & hot water via district heating network, year-round operation or heat production adds up to heat consumption plus network losses

Total area: thermal energy to be produced

- Effective heat in kWh/a
- Network losses in kWh/a

## Heat output / Load types

The wood-powered boiler can be designed for the maximum load (monovalent) or for the main or base load (bivalent). The smaller the boiler output, the longer the operating time and also, however, the higher the stress on the boiler.



Area: Proportion of wood power, kWh/a (from o to c, b, a)

Load type	System type	Coverage of heat output [% of kW]	Hours of full operation [h/a]	Coverage by wood power [% of kWh/a]
a)	1 stand alone	100	approx. 1750	100
b)	2 base load	75	approx. 2500	approx. 97
c)	2 base load	50	approx. 3600	approx. 70

### Other terms

- Low load** Boiler output below 30% of rated load
- Heat availability** System's delivery of heat during heating period [%]
- Boiler availability** Operating time of the boiler during heating period [%]
- Track time** Operating hours between maintenance breaks [h]
- Redundancy** Boiler output installed for reliability (boiler failure)

## Boiler systems

- 1) Monovalent**
  - One wood-powered boiler (a) for maximum load
  - Heat availability: approx. 98-99%
- 2) Bivalent**
  - Wood-powered boiler (a) for base load
  - Oil or gas boiler for (b) peak load, low load and for redundancy
  - Heat availability: 99.5 to 99.9%
- 3) Double-boiler system**
  - Maximum load with two wood-powered boilers (a1, a2)
  - Heat availability: approx. 99.6%
  - a1 & a2 alternately, peak load and base load for split-up, 2 x 50%

### Advantages of heat accumulators (c)

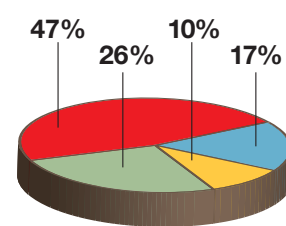
- Boosts heat availability
- Coverage of brief peak requirements
- Optimises the connection of additional boilers
- Acceptance of excess heat when the heat is stopped
- Hydraulic separation: boiler system / consumers

### Advantages of double-boiler system

- 100% sustainable wood energy
- Excellent controllability
- Maximum heat availability
- Gentle boiler operation

## Economic efficiency / Heat costs, €/kWh

The aim of optimising systems is to minimise the expected heat costs (€ per kWh).



Example: Package boiler of approx. 1,000 kW for large single building or mini-network with forest woodchips

### Breakdown of heat costs as a %/kWh

- Service of capital for furnace 10%
- Service of capital for remaining investment 26%
- Service of capital for total investment (10 yrs.) 36%
- Fuel – wood 47%
- Operation with full maintenance 17%
- Regular operation 64%

## Conclusion

The heart of the biomass system, the furnace, is only party to 10% of the heat costs. However, the furnace together with its degree of efficiency (fuel consumption), and the regular operating costs decides the economic efficiency of the overall system!

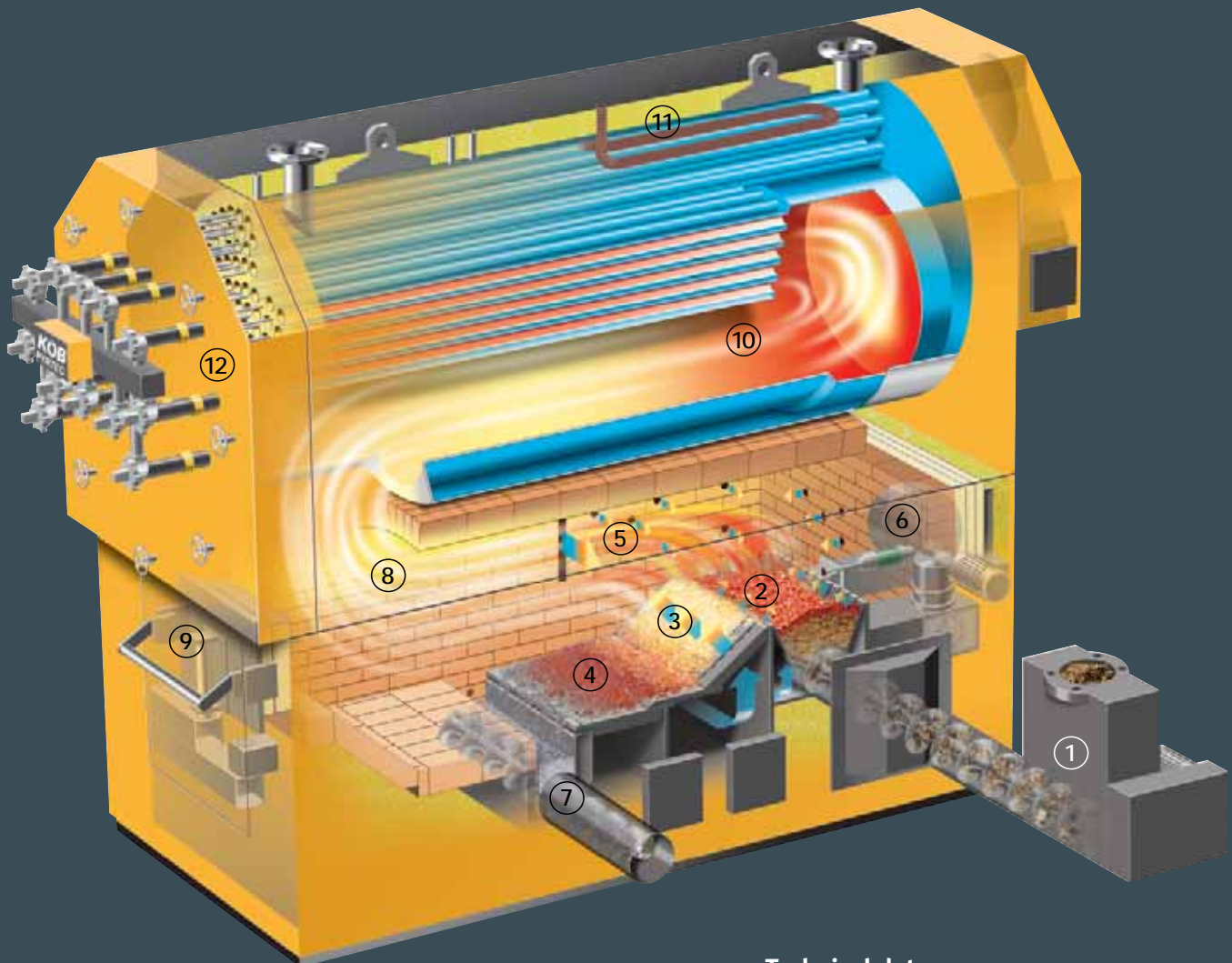
## Thus our recommendation

Optimise your heat costs with an effective boiler. The extra investment this requires will quickly pay for itself.

With the PYRTEC furnace system you ensure the economic efficiency of your biomass heating system and thus profits for yourself!



# Top Quality Furnace Technology.



- |   |                                      |  |
|---|--------------------------------------|--|
| 1 Feed auger with isolating layer                         | 5 Secondary airflow                  | 9 Firebox door                           |
| 2 Burner trough with internal grate and primary airflow 1 | 6 Ignition fan                       | 10 3 - boiler shell (3.0 bar or 6.0 bar) |
| 3 External grate with primary airflow 2                   | 7 De-asher                           | 11 Safety heat exchanger                 |
| 4 Moving feed grate                                       | 8 High-temperature zone for burn-out | 12 Pneumatic pipe cleaning system        |

## Grate firing with all its advantages

The combination in the PYRTEC of the moving feed grate with the tried-and-trusted burner trough and the drop-down external grate unites in optimum fashion the advantages of moving feed grate firing with the advantages of underfeed firing.

## The advantages

- General-purpose use for all wood fuels from dry (W5) to wet (W45), with pre-drying system up to recently felled wet (W60)
- Outstanding controllability 30%-100%
- Excellent low-load behaviour with ignition system
- Maximum safety against burn-back
- Fully automatic de-ashing of the furnace
- Not shown:
  - Flue gas recirculation system for dry fuels
  - Exhaust gas deduster (multi-cyclone), incl. exhaust fan

## Technical data

Furnace type	Rated output kW <sup>1)</sup>	Furnace dimensions mm <sup>2)</sup>			Weight empty kg <sup>2)</sup>
		Height	Length	Width	
Pyrtec 530	530	2702	3237	1380	6575
Pyrtec 720	720	2834	3877	1380	8054
Pyrtec 950	950	3035	3835	1612	11013
Pyrtec 1250	1250	3230	4380	1612	13809

- 1) Water content of wood fuel: W5-W40  
2) Without attachments

## Test certificates

Product and manufacturer completely tested and monitored by TÜV with the following certificates:



Following EN-303

- B Design and manufacture
- C Heating engineering
- E Electrical engineering
- SR Fast shutting down
- SP Operational safety



EMPA test report  
VKF approval



VHe type-tested

# Made-to-measure energy.

## For all wood fuels ...

### 6-mm pellets with seal of quality



The most compact form of wood energy. (Three to six times more energy per m<sup>3</sup> than forest wood chips). Look for brand quality complying with standards (e.g. ÖNORM M7135).

### Industrial pellets



More cost-effective pellets with a larger diameter and a greater proportion of bark (max. ash content 10%) for large-scale facilities.

### Forest woodchips



Untreated, machine-shredded wood from forests. Stored for a summer before being shredded. Size: G50; water content: to W45; ash content: 0.5% -1.0%, depending on the proportion of bark. With our patented

pre-dryer even chips from very wet wood (approx. W60) are possible.

### Wood off-cuts



National regulations have to be checked for approval as fuel! Irrespective of such, the limits for chlorine, sulphur and sodium have to comply with KÖB's „Minimum Requirements for Wood Fuels“. In case of doubt,

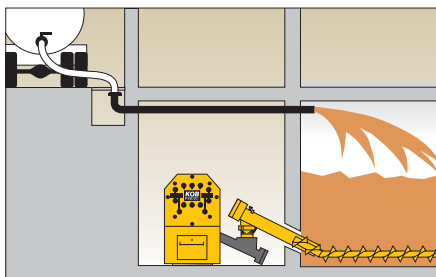
we will be happy to carry out an economical fuel analysis.

### Briquettes from off-cuts



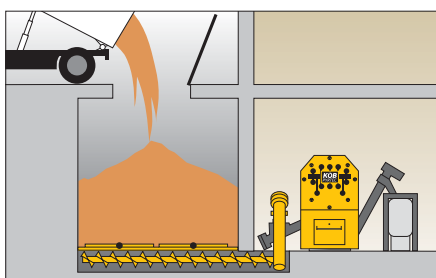
With high proportions of fine particles, fuel should be compressed (briquettes). The size and solidity should be geared to the loader system.

## ... and for all system prerequisites!



### Pellets in basements

Existing basement rooms or former oil storage units are ideal for use as pellet storage units without major reconstruction work. Pellets can be blasted in over large distances. Special pellet augers convey them reliably, using little energy.

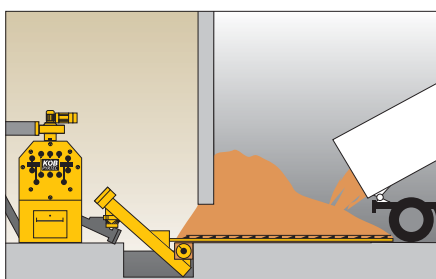


### Forest woodchips in bunkers

By means of large hydraulically operated lids, the underground storage unit (bunker) can be quickly filled from the top. The extraction is carried out by a hydraulic moving floor conveyor to the subsequent conveyor augers

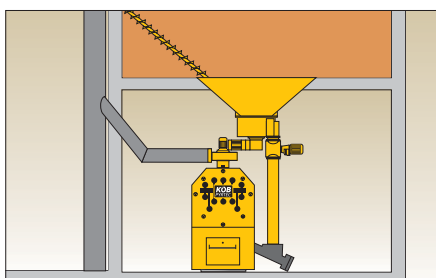
Other accessories:

- Pre-dryer instead of ascending conveyor auger
- Floor conveyor loader for inside basement rooms with an attached filling bunker on the outside wall.



### Forest woodchips at ground level

If an underground fuel storage unit cannot be realised, it is possible to move lengthwise by means of a moving floor conveyor and thus fill the storage unit at ground level.



### Wood off-cuts in silos

The to and fro motion of the pendulum system for silo extraction rules out not only bridge formation but also compacting in the hopper. Fire-protection-tested rotary valves reliably separate the silo and heating system in all situations.

## Pre-dryer for forest woodchips (patented)

### How it works

Wet forest woodchips are pre-dried by warm air on the way to the furnace. The drying power is automatically adjusted to the water content of the chips. The efficiency of the entire system is increased due to improved combustion resulting from pre-drying the fuel

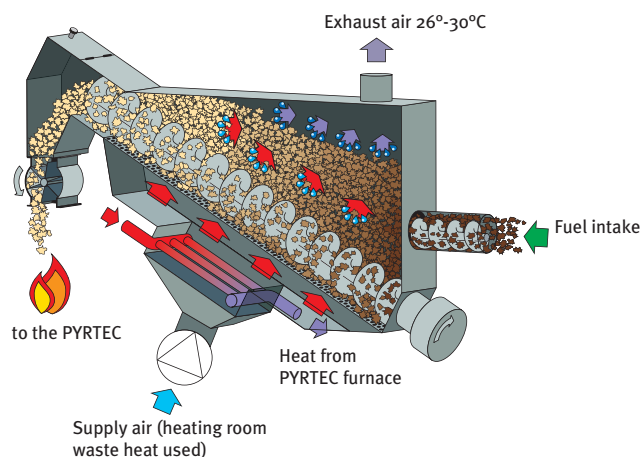
(less surplus air than with wet combustion).

### When to use

Whenever the water content of the chips might be greater than 50%

### The advantages (over wet combustion)

- Higher degree of system efficiency (plus 10%)
- Better output control behaviour
- Better control behaviour on change of fuel
- Better emission levels in all phases



# Tried, trusted & efficient.

## Fuel Loading Unit

### a. Backflash safeguard („RZS“)

- Metering container with continuously present, monitored isolating layer
- Permanent, monitored negative pressure operation (exhaust fan with negative pressure control system)

### b. Burn-back-inhibiting system („RHE“)

- A solid auger in a round insertion pipe automatically completely empties itself if there is a danger of back-burn (temperature sensor).

### c. Burn-back safeguard („RSE“)

- A horizontally acting slide valve with spring-return motor in case of power failure or the danger of back-burn.
- Rotary valve in case of excess or negative pressure in the wood (all-steel design).



### Pneumatic cleaning system <sup>1)</sup>

Pneumatic cleaning of the furnace. The heat exchanger is periodically cleaned by blasts of

compressed air. This extends the furnace's track time (maintenance-free operation in h) many times over.

### Automatic de-ashing <sup>1)</sup>

Automatic de-ashing of the combustion. Light-barrier-controlled, going into a large-volume ash container.

### d. Automatic fire-extinguishing system („SLE“)

- 20-l extinguishing water tank with float switch
- A thermal valve on the metering container automatically extinguishes the fire as a last safety precaution.



#### Rear

- Drive for feed grate.
- Primary airflow fan, phase 1
- Ignition blower for fuels up to W40 <sup>1)</sup>.



#### Perfect access

A large, air-cooled firebox door with solid double hinge swings way back. Ideal for maintenance purposes.



#### High-quality materials

- Brick lining with compressed and baked firebricks with high alumina content.
- All the grate elements are made of thick-walled cast chrome steel. (Material no. 1.4868)



### Exhaust gas de-duster <sup>1)</sup>

Exhaust gas de-duster for minimising dust emissions; multi-cyclone, fully insulated with exhaust fan mounted either on the side or on top, with 240-l ash container. Also available as 800-l container for an extra charge.



### Flue gas recirculation system <sup>1)</sup>

Ideal for dry fuels (less than W20), with the following advantages:

- High degree of efficiency due to the low amount of surplus air (pellets).
- Lowering of the combustion temperature, which is especially important for fuels that tend to form slag (wood off-cuts from industry).

<sup>1)</sup> Accessory for the PYRTEC at an extra charge



# Controlled & optimised.

## Pyrocontrol



Control cabinet with door open.

### Control system for the furnace facility

A programmable control system for the complete PYRTEC furnace facility with modulating output control system and optimised combustion with lambda sensor.

All the fans are speed-controlled!

The firebox is monitored by:

- Light barriers for the fuel limitation system
- A pressure sensor for reliable negative pressure
- A firebox sensor for temperature limitation (addition of more secondary air or recirculated flue gas)



Image on monitor for visualisation and remote maintenance (extra charge)

## Drycontrol



Control panel with plain language display (like PyroControl)

### Control system for the pre-dryer

A separate control cabinet with programmable control system for pre-drying wet fuel (over W50 to W60).

The heat put out by the air heater is precisely and automatically adjusted to the water content of the fuel by detecting the exhaust air. To do so, the air heater's fans are speed-controlled with continuous regulation of the heater temperature. The auger moves according to the requirement for fuel.

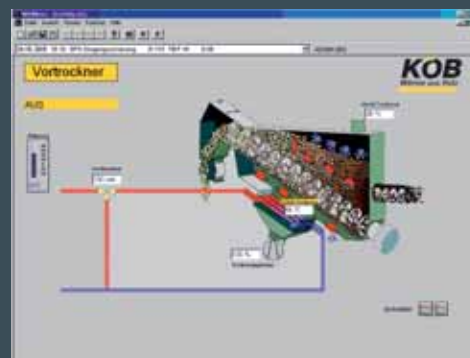
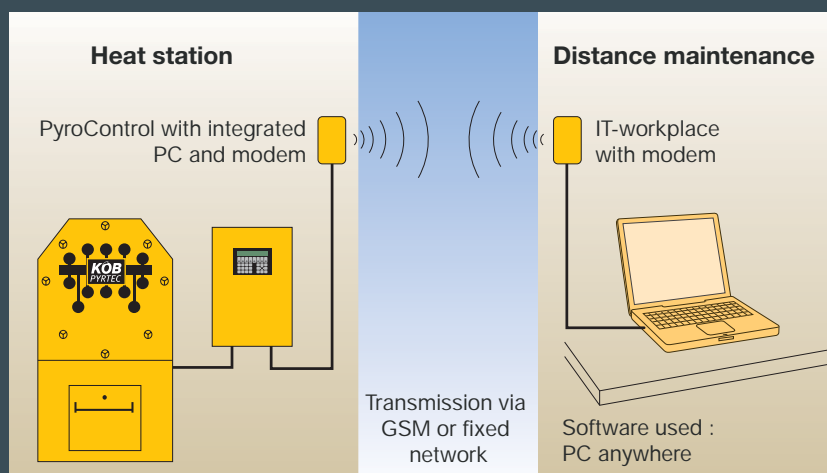


Image on monitor for visualisation and remote maintenance (extra charge)

## Remote maintenance with data archiving



For remote maintenance, the PyroControl can be equipped at an extra charge to an integrated PC and integrated modem as well as software based on the facility to provide visualisation. As a result, the entire facility (incl. loader and pre-dryer) can be monitored from any IT-workplace authorised to do so. KÖB normally delivers the complete hardware and software on the basis of the heat station.

Ideal for monitoring the heating systems of public facilities by contracting firms.

# Customer-focussed.

## Partnership

On the purchase of a KÖB heating system customers not only obtain a product with top quality engineering but also a sound, permanent partnership. Because KÖB's success is due above all to our customers' great satisfaction.

## Consultancy

KÖB attaches maximum importance to competent and comprehensive consultancy in the interest of the operating organisation. This is why KÖB has extremely experienced sales technicians in the region, who are continuously further trained at the KÖB organisation and brought up to date on the latest developments in the technology. These sales technicians will be happy to apply all their experience in optimising your new heat station.

## Planning and project management

The KÖB organisation has a separate department for project management. Together with the sales technicians responsible, our project management specialists draw up solutions adapted according to customer wishes, providing support for you from the initial consultancy until the order is placed. PC-based data exchange (Auto CAD) is possible with no problem.

## Manufacture and delivery

When an order is placed, the facility components are produced using ultra-modern methods and made available on schedule. The prerequisite for starting production is confirmation by the client of the project drawn up. Transport and delivery are always carried out according to arrangements with the customer.

## Installation and commissioning

The installation is only carried out by specialists in the KÖB organisation, or if the order is handled by an authorised business, by fitters trained in the KÖB organisation.

The same also applies to commissioning. It will only be carried out by specialists from KÖB.

KÖB has a very well developed network of commissioning and service technicians, who will always stand by our customers also after the handover.

## Operational reliability

Due to perfected engineering and the robust design, reliable continuous operation with maximum operational reliability is provided even for tough instances of use.



The high degree of automation means that maintenance and operating work are reduced to a minimum but cannot be ruled out entirely. Be sure to operate and service the facility according to the relevant directions.

## Customer service

Just in case, there is reliable customer service on call and available to you in your vicinity. We recommend that you have our specialists carry out an inspection, adjustment and maintenance of your facility during the summer months. You can then look forward to the next winter, knowing that you will be heating reliably and effectively.

## Excellent experience

Optimising the costs of heat is a complex matter. This is why local authorities in particular are handing over the construction and operation of these systems more and more to energy professionals (contracting firms).

KÖB's many years of co-operation with contracting firms have produced hundreds of reference facilities all over Europe – proof of the great trust held by contractors and the market in performance by KÖB!



Wärme aus der Natur