



**Compact CHP units 50 – 550 kW**  
**compact • efficient • reliable**



**SOKRA<sup>®</sup>**  
**therm**  
Cogeneration





## **SOKRATHERM cogeneration units**

### **Individual plants for best energy utilisation**

Combined heat and power generation (CHP) units provide for an eco-friendly energy production by use of the highly efficient principle of cogeneration. With the compact CHP units built by us, electricity and heat can be produced directly on site and used without transportation losses.

Because of their significant contribution to a sustainable energy supply, cogeneration plants are promoted by the government in Germany and many further countries.

In contrast to large power plants, CHP units can be switched on and off and regulated in partial load within seconds. This highly flexible method of power generation can help to balance the volatile power production of wind and solar power plants.

With over 1,500 compact CHP units delivered worldwide and numerous awards, we are one of Germany's leading CHP unit manufacturers. A strong focus on the quality of our products as well as our aftersales service has provided us an excellent market position.





Compact CHP unit GG 530 in the Energiebunker Hamburg which supplies an urban district.

The foundation of the high quality level and innovation power is our experience: For now over 40 years we have built compact CHP units for most various requirements and applications such as:

- Hospitals and nursing homes
- Administration buildings
- Housing schemes
- Hotels
- Swimming pools
- Industrial and commercial sites
- Sewage and biogas plants
- Breweries
- Food processing plants

The high dedication of our workforce, our team spirit and the flexibility inside the company allow SOKRATHERM to be a top class runner: working with cutting edge technology, committed to customer needs and strictly oriented towards economically as well as ecologically expedient solutions.

Regular surveys among our customers confirm a constantly high level of customer satisfaction. The results of these surveys conducted as part of our ISO 9001 certified quality management system are published on our website.

## 50 kW class

### References

- Alpenhotel Zechmeisterlehen, Schoenau
- Gas decompression plant, Bielefeld
- Outdoor pool and school, Waldmohr  
*mobile CHP unit*
- Bremen fairground
- Retirement home, Padua (Italy)



## 100 kW class

### References

- Rohde AG, Noerten-Hardenberg  
*CHP unit of the year 2014*
- LWL-Clinic, Lippstadt
- Marriott Hotel Amsterdam airport
- Swimming pool  
Badeparadies Eiswiese, Goettingen
- Johnson & Johnson, Courcelles (Belgium)



### Comprehensive scope of delivery

We offer compact CHP units powered by natural gas, bio-methane, sewage gas or biogas in five power classes. The core components are a gas engine which powers a generator, several heat exchangers which extract the heat from exhausts and engine cooling to be used in the heating system and a sound absorbing case with integrated switchgear cabinet.

Due to a sophisticated composition of all components we use our compact CHP units reach total efficiencies of more than 90%. At return temperatures below 60°C, this efficiency can be increased even further with an additional condensing heat exchanger.

### Flexible application

Our CHP units are manufactured individually to fit the customer's needs. It is for example possible to fit the units as ›hot coolers‹ which can operate on the higher temperature level (95/80°C) instead of (90/70°C) to e.g. supply absorption chillers for air-conditioning or process cooling. On top of that, we offer special solutions for steam generation or heating up thermal oil.

Additionally our CHP units can be configured to take over the electricity supply of defined consumers (e.g. pumps, sprinklers, production lines, computers, lighting) in the case of a mains failure.



## 500 kW class

### References

- Flex-cogeneration in residential housing, Oberhausen
- Steel plant SPTE Acroni, Jesenice (Slovenia)
- Energiebunker, Hamburg
- Thiebauth school, Ettlingen
- Sana Klinik, Luebeck



### Reliable Operation

The manufacturing is followed by an extensive test bench run and a first servicing of every unit. We deliver our compact CHP units ready to connect and operate so they can be installed and commissioned as quickly as possible. Only long-term proven components from well-known suppliers are implemented in our units. With maximal product quality we ensure a minimal fault potential.

The compact design of our CHP units reduces the cost for integrating the unit into the building and the space requirement. A special triple elastic decoupling prevents vibrations from spreading to the building. Therefore, a separate foundation is rarely necessary.

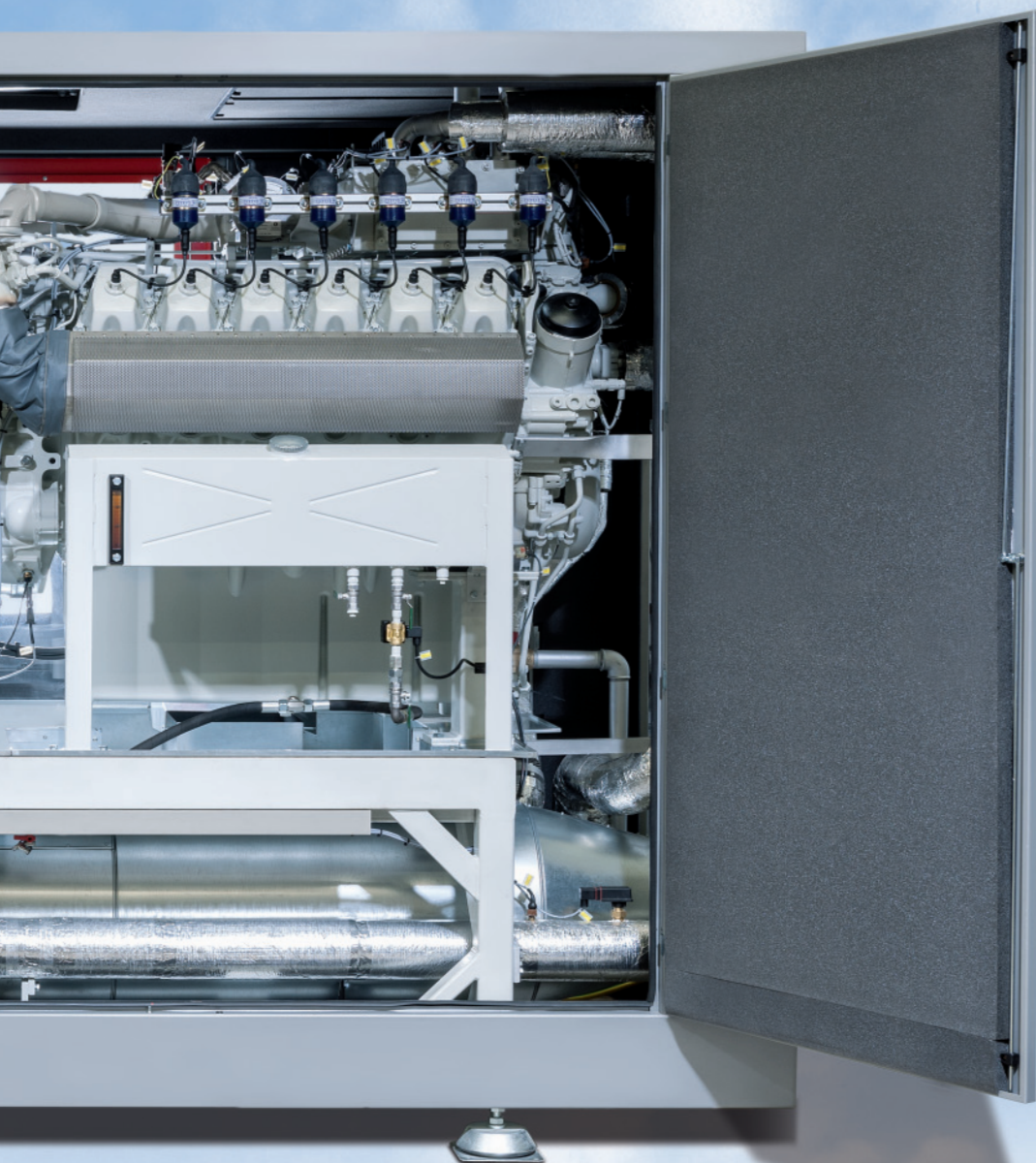
### Service

Integral parts of our offer are well-engineered maintenance concepts which are continuously adapted to the technical progress. For every CHP project, we offer individual service packages – from the simple regular service with customer participation up to an ›all-inclusive carefree package‹ including operation optimisation and general overhaul.

Service reports are generated online and immediately transferred to our service center for an automatic evaluation. A network of service points makes sure that skilled service personnel is available at short notice.



# SOKRATHERM: Modular technology – flexible and ecological up to 2,000 kW power in multi-unit plants



## CHP unit sizing

The CHP power can be consumed directly on site, surplus power fed into the mains or avoided with a zero feed-in control. The CHP heat can be used for heating and hot water generation. For higher flexibility, the heat can be stocked in buffer storages as well.

To achieve best economic results the CHP unit usually covers the heat and power base load while the peak loads are covered by a boiler and the power mains. The CHP size is usually determined by the object's maximum heat demand ( $Q_{\max}$ ). Depending on the climate zone and the cost of electricity and gas, a profitable operation can be reached when the heat output of the CHP unit is 10 – 30% of  $Q_{\max}$ .

In spite of its relatively low power capacity the CHP unit can cover more than half of the yearly demand due to the high utilization rate. In special cases, e.g. for peak or emergency power supply, the CHP size is determined by the electrical power demand.

## Multi-unit plants

For better adaption to the heat demand and/or to achieve a backup supply, the required power can be split up into several CHP units.

In this case, our superordinate control *MaxiManager* provides for a perfectly aligned operation of the single CHP units.

## 200 kW class

### References

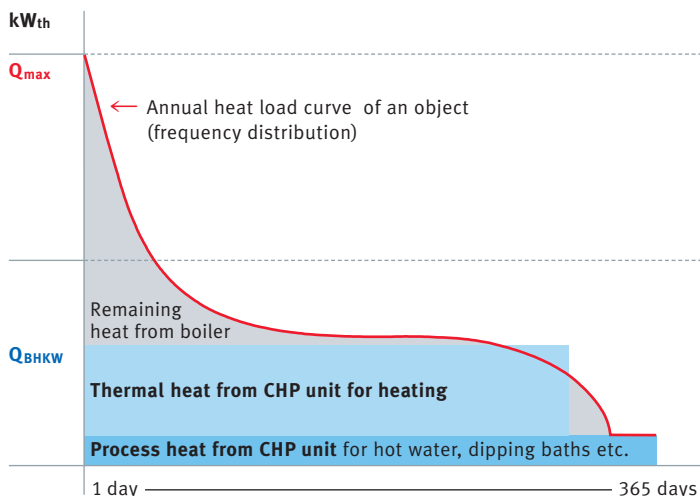
- Brewery Früh, Cologne with steam generation
- Freie Universität Berlin, Campus Lankwitz
- Water purification plant Kielseng, Flensburg
- Hotel Rodina, Sochi (Russia)
- SMA Solar Technology AG, Kassel



## 400 kW class

### References

- Max Planck Institute, Goettingen
- Grundfos pump factory, Wahlstedt
- Hospital Clinico de Magallanes, Punta Arenas (Chile)
- J.G. Niederegger Marzipan, Luebeck
- Rahning rotogravure, Buende with thermal oil heating



### $Q_{\text{max}}$ ( $\text{kW}_{\text{th}}$ )

300 –	800
500 –	2.000
900 –	3.500
1.700 –	5.000
2.200 –	7.500
bis	20.000

### CHP unit class ( $\text{kW}_{\text{el}}$ )

50 kW
100 kW
200 kW
400 kW
500 kW
individual sizing

Further information is available on our homepage.

$Q_{\text{max}}$  = Object's maximum heat requirement

$Q_{\text{BHKW}}$  = Thermal power of the CHP unit



#### CHP unit control

For a fully automatic and safe CHP operation

#### MiniManager

For intelligent interaction between CHP, boiler and buffer

#### RemoteManager

Internet based remote monitoring and controlling system



## Control and monitoring system for economic operation of the whole CHP scheme

The CHP unit is operated and monitored by an industrial computer. Its touchpanel allows comfortable handling and a detailed insight into current operating values. It can e.g. display recorded values in order to analyse the operational behaviour of the unit and if necessary improve it by changing the units' parameters.

For perfect interaction between CHP, buffer and boiler the *MiniManager* control system is included in every unit as a master control. For plants with one CHP and e.g. more than one boiler or an extended buffer management the *MiniManager PRO* is the control system of choice.

The master control *MaxiManager* can provide for the runtime optimised operation of multiple CHP units, boilers and/or the load management during emergency power operation.

Our internet based *RemoteManager* enables the remote control and remote monitoring of the whole plant from a desktop PC, notebook or smartphone. A standardised web interface allows the units to be integrated into virtual power plants to provide balancing energy.

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