Compact CHP units 50 – 1,000 kW

compact · efficient · reliable






SOKRA® therm
Cogeneration

SOKRATHERM Cogeneration units

Individual plants for best energy utilization

Combined Heat and Power (CHP) units contribute to an eco- and resource-conserving energy supply through the highly efficient principle of cogeneration. With our compact CHP units, electricity and heat can be generated directly on-site, minimizing transportation losses. The fuel for these units includes not only natural gas and propane gas but also an expanding array of renewable gases such as biomethane, sewage gas, biogas, green hydrogen or specialized gases like landfill gas.

As cogeneration units produce energy in an environmentally friendly manner, increasingly using renewable gases and being adjustable in power, they play a crucial role in further expanding renewable energies such as wind and solar power. This is why the government in Germany and many other countries actively promotes cogeneration.

In contrast to large power plants, CHP units can be switched on and off and regulated at partial load within seconds. This capability to supply electricity on demand enables them to cover a significant share of the residual load, bridging the gap between the variable generation of wind and solar power and the fluctuating demand for electricity.

With over 2,000 compact CHP units delivered worldwide and numerous awards, we stand as one of Germany's leading manufacturers of CHP units in our power class. A strong focus on quality, both in our products and services, has secured our excellent market position.

The foundation of our high level of quality and pronounced innovative strength is our experience: For over 45 years we have been manufacturing compact CHP units for a wide range of requirements and applications such as:

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

The high commitment of our staff, team spirit and the flexibility within the company enable SOKRATHERM to set standards: at the cutting edge of technology, committed to the wishes of our customers and strictly orientated towards economically and ecologically sensible solutions.

Regular surveys among our customers consistently confirm a 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

- Durrant House Hotel, Northam (England)
- Five CHP units at different district heating centers in Charkiv (Ukraine) *CHP mobile with emergency power function*
- Rehabilitation clinic Usedom, Heringsdorf
- Sewage plant in Prato allo Stelvio (Italy)
- Husum Mineral Wells, Husum

100 kW class

References

- West Hants Tennis Club, Bournemouth (England)
- Palazzo Fiuggi Hotel, Fiuggi (Italy)
- Johnson & Johnson, Courcelles (Belgium)
- Biogas plant, Glumslöv (Sweden)
- Heckler & Koch, Oberndorf *Compressed air & heat generation unit*

Comprehensive product range

We offer compact CHP units in six power classes. The core components include a gas engine that drives a generator, several heat exchangers that extract the heat from the exhaust and engine cooling to the heating system and a sound-absorbing case with an integrated switchgear cabinet.

Thanks to the sophisticated combination of all components, our compact CHP units achieve total efficiencies of over 90%. When return temperatures are below 60°C, this efficiency can be further increased with an additional condensing heat exchanger.

Flexible Application

Our CHP units are manufactured individually to fit the specific needs of the customer. For instance, it is possible to configure the units as ›hot coolers‹ which can operate on a higher temperature level (95/80°C) than standard (90/70°C). This allows them to, for example, operate absorption chillers for air-conditioning or process cooling. We also provide gas engine compressor units for the generation of compressed air and heat, along with special solutions for steam generation or thermal oil heating.

Additionally, our CHP units can also be equipped for black start capability. In the event of a mains failure, they will start independently within a few seconds and supply defined consumers (e.g. pumps, sprinklers, production lines, IT, light) with electricity.

500 kW class & 700 kW class

References

- Tierpark Berlin
  (Europe's largest Zoo)
- District heating, Oberhausen
  Flexible Cogeneration plant
- La Nuova Caseria,
  Mozzarella producer,
  Napoli (Italy)
- Carl-Thiem Clinic, Cottbus
- Procter & Gamble plant,
  Crailsheim

Reliable Operation

After customized production, an extensive test bench run is conducted at our factory and the first servicing is performed. We deliver our compact CHP units ready to connect and operate, enabling them to be installed and commissioned in the shortest possible time. Only long-time proven components from well-known suppliers are implemented in our products. With maximum product quality we ensure a minimal potential for faults.

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

Maintenance & Service

Integral part of what we offer is a well-engineered maintenance concept that is continuously adapted to the technical progress. For every CHP project, we offer individual service packages ranging from the simple regular service with customer participation to an ›allround carefree package‹ including operation optimization and general overhaul.

Service reports are generated online and promptly transferred to our service center for initial automatic evaluation. Our digitalized service process ensures the smooth organization of service deployments and the availability of all required material. A broad network of service points makes sure that skilled service personnel is available at short notice.

SOKRATHERM customized technology
flexible, reliable, economical and eco-friendly

CHP unit dimensioning

CHP schemes are typically dimensioned in relation to the heat demand of the supplied object (e.g. hospital). The size of the CHP unit is determined by the maximum heat demand (Q_{max}, see diagram). Depending on the climate zone, the level of electricity and gas prices, a profitable operation is achieved with a CHP thermal power (Q_{CHP}) of e.g. 40% of Q_{max}. This way, the CHP plant covers a significant share of the annual heat requirement. In special cases, such as peak or emergency power generation, the dimensioning is based on the electricity demand.

The electricity generated by the CHP unit is consumed on-site or fed into the electricity grid. The thermal energy is utilized, for example, to heat the building, generate hot water or as industrial process heat. To enhance flexibility for power market-orientated operation, it can be stored in buffer storages.

To increase the share of renewable energy on-site we recommend considering heat pumps and large buffer storages in addition to the CHP. Peak load heat generators such as gas or electrode boilers should only be installed for particularly cold days and as reserve capacity.

Multi-unit CHP plants

For a better match with the energy demand and/or to increase the security of energy supplies, the calculated or required power can be distributed among several CHP units. They can be combined in size and number to precisely fit the objects and their users.

Our intelligent control systems ensure the demand-oriented operation of one or more CHP units in combination with other heat generators such as heat pumps or boilers. Additionally, they can determine their rank order for the lowest possible heat generation costs, depending on factors such as the outside temperature, the charge level of the buffer storage and prices for electricity and gas.

200 kW class

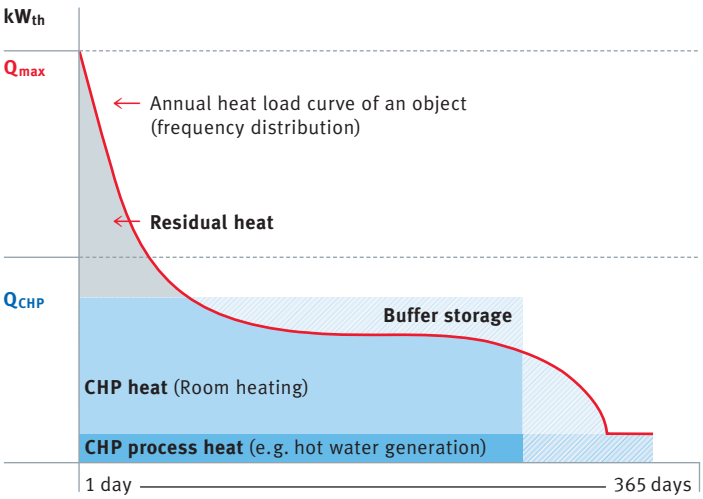
References

- Berlin airport BER
- West London Film Studios
  with emergency power function
- Prison Willich
- Biogas plant, Ljung (Sweden)
- Brewery Früh, Cologne
  with steam generation

400 kW class

References

- The Grand Green Family Hotel, Oberhof
- Sartorius life science & bioprocessing, Goettingen
- Sewage plant Coburg
- District heating Vahrn (Italy)
  with emergency power function
- Spectrum Yarns, Huddersfield (England)



Qmax (kWth)	CHP unit class (kWel)
200 – 700	50 kW
350 – 1,200	100 kW
650 – 2,300	200 kW
1,000 – 3,600	400 kW
1,500 – 6,000	700 kW
up to 20,000	Individual dimensioning

Further information is available on our homepage. Our sales team is happy to support planners in dimensioning the CHP plant – also in combination with a heat pump.

SOKRATHERM control systems
intelligent energy generation

The CHP unit is operated and monitored by a robust industrial computer. Its touchpanel allows comfortable handling provides a detailed insight into current operating values. It can, for example, display recorded values for analysing the operational behaviour of the unit and, if necessary, improve it by changing the units' parameters.

For perfect interaction between CHP unit, another heat generator and a buffer the *MiniManager* control system is included as a master control in every CHP unit. For plants with one CHP unit, multiple heat generators and/or an extended buffer management the *MiniManager PRO* is the control system of choice.

When deploying a heat pump, its operation can be economically optimized with the *MiniManager Plus* by considering numerous parameters. The master control *MaxiManager* can ensure 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. Numerous interfaces ensure its compatibility with all widespread building control systems. A standardised web interface allows the units to be integrated into virtual power plants to provide balancing energy.

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