VIESMANN

CHP units for heat and power

An investment in greater efficiency is an investment in the future

Today, decentralised energy production with combined heat and power generation is one of the most economical ways of obtaining electricity and heat while conserving resources. Its clear advantage over conventional generation is the far better utilisation of primary energy. Practically no lost exhaust heat or transmission losses into the power grids make CHP units a sustainable alternative in terms of reducing CO_2 emissions and conserving valuable fuel resources.

The ecological effect isn't the only positive consequence. Electricity and heating costs are significantly reduced and deliver a meaningful economic advantage. The self-generated electricity is much cheaper than electricity from the grid.

The systems developed by Viessmann are designed for both commercial and communal use. With a suitable high capacity and tailored to operational processes for a reliable supply of electricity, heat/refrigeration and hot water. To make your investment in greater efficiency an investment in the future, too. And vice versa. You will find more about these applications in this brochure.

Combined heat and power generation: decentralised heat and power generation

In most cases, primary energy is used only once, for example to generate heat or electricity. With combined heat and power generation, the energy used is utilised twice: this is because CHP units simultaneously supply both heat and power.

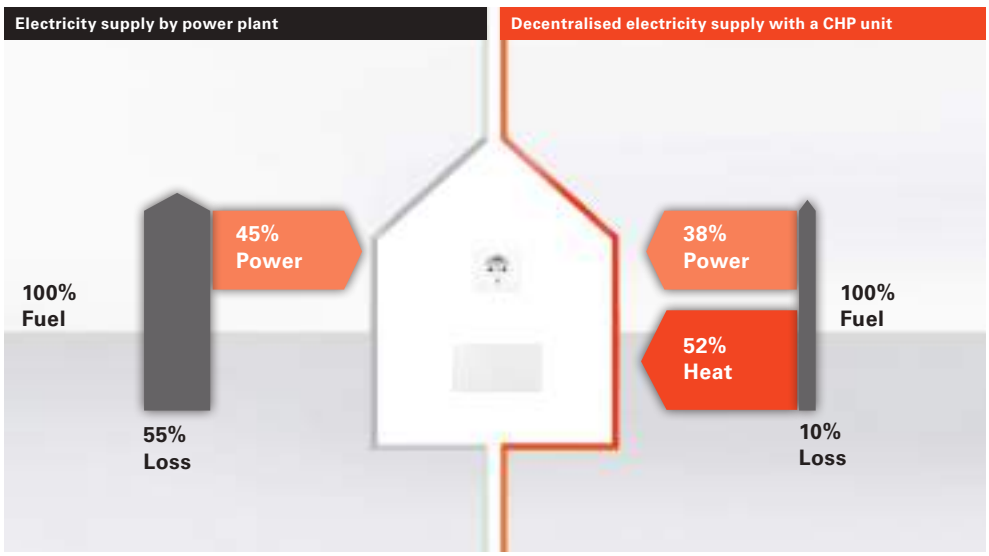
Combined heat and power generation systems meet energy transition requirements perfectly. They are efficient and therefore cost-effective and can be used on a decentralised basis and on practically all scales. Compared with other technologies, they also provide much greater efficiency.

Proven technology for an innovative energy supply
Gas-operated combined heat and power (CHP) units simultaneously produce both electrical energy and heat according to the principle of combined heat and power generation. This involves a special gas combustion motor designed for high efficiency driving the generator to produce electricity.

Power: for consumption on site – or to feed into the grid
Electricity is produced in tailor-made units for on-site consumption. Any power not required is exported to the public grid, and the power supply utility provides remuneration accordingly.

Heat: using it efficiently and with hardly any loss
Unlike with central power plants, the heat produced in a CHP unit is not lost. The heat is fed into the heating network. Together with an additional heat generator, for example with a boiler, the building is supplied with electricity, heat and hot water with hardly any losses. And: refrigeration needs can also be covered either in whole or in part by connecting an adsorption or absorption refrigeration unit.

Normally, central power plants produce only electricity. The resulting heat is lost. On the other hand, up to 36 percent less primary energy is used with combined heat and power generation (CHP) – that means a significant reduction in energy costs.



Viessmann CHP units achieve a total efficiency of up to 95 percent. Together with the simultaneous production of electricity and heat, this makes CHP units extremely efficient.

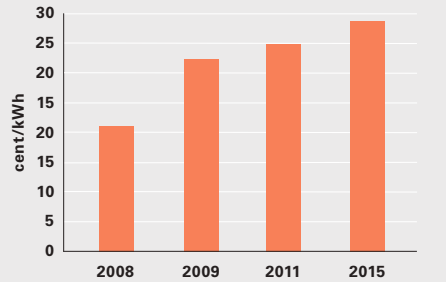
Use the electricity generated on site, or export it into the grid?

Operators of CHP systems achieve greater economy by, if possible, themselves using 100 percent of electricity from the CHP unit. When they do so, the costs of the electricity generated on site is offset against the cost of electricity from the energy provider. This allows savings of up to 14 pence/kWh to be achieved.

Convincing figures

The clear advantage that combined heat and power generation has over conventional separate electricity and heat production is its much better primary energy utilisation. The overall efficiency of Viessmann CHP units can be as high as 95 percent. For example, the Vitobloc 200 EM-20/39 module achieves thermal efficiency of over 63 percent and electrical efficiency of over 32 percent.

Output to private households

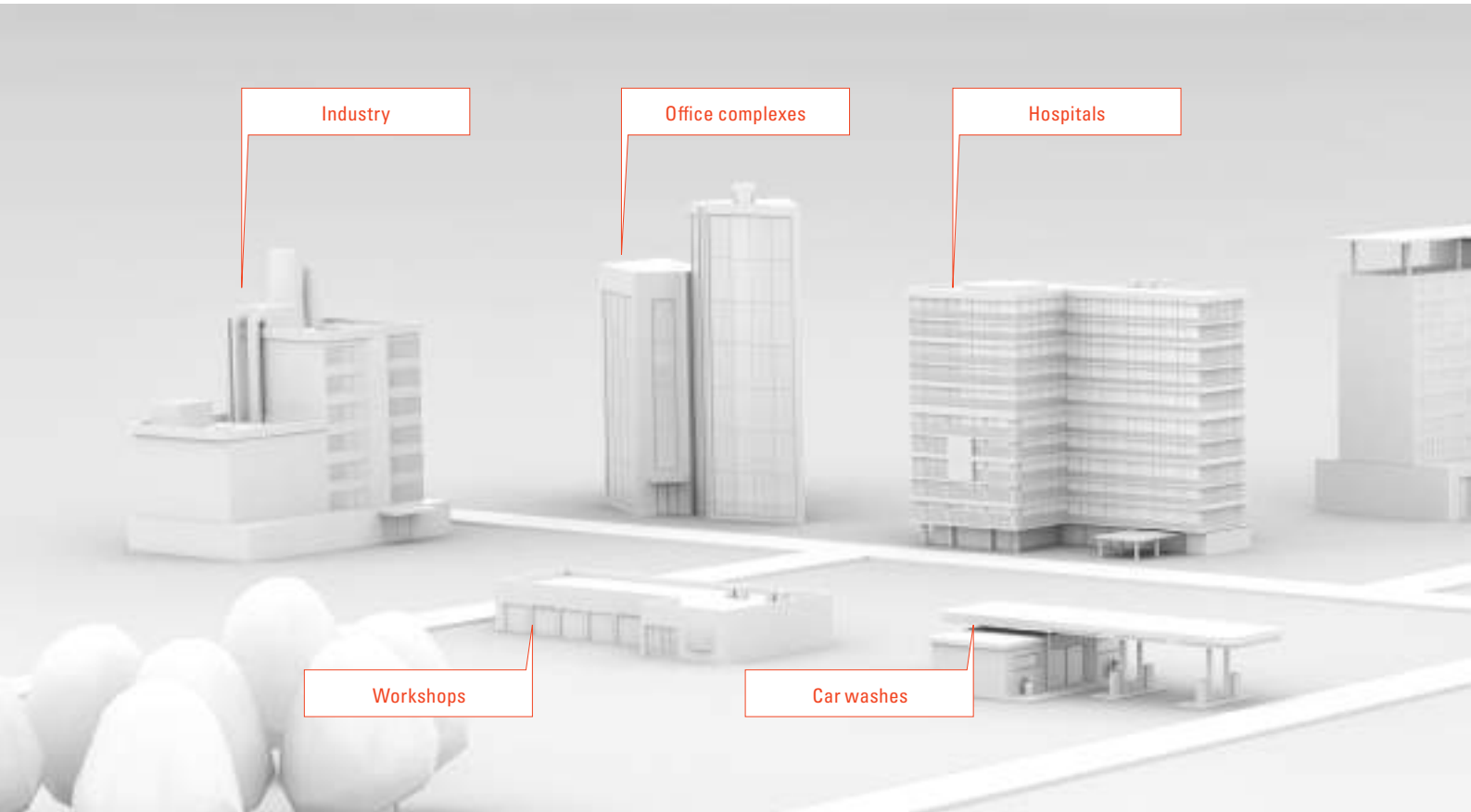


Electricity costs have been continuously increasing in recent years. It's therefore worth generating your own electricity with a CHP unit.

A proven principle as the basis for different applications

The Viessmann CHP units that are designed specially for commercial use come into their own wherever there is a continuous need for electricity and heat.

Today, electricity and heating costs are a significant factor for many commercial and production companies, for municipal facilities and also in cultural establishments and residential buildings. CHP units offer enormous savings potentials here: with their highly efficient fuel utilisation without transport losses and with a significant tax saving, they guarantee low operating costs and ensure rapid investment amortisation. With their performance, they are specially designed for commercial companies and residential buildings where there is a permanent demand for electricity and heat.



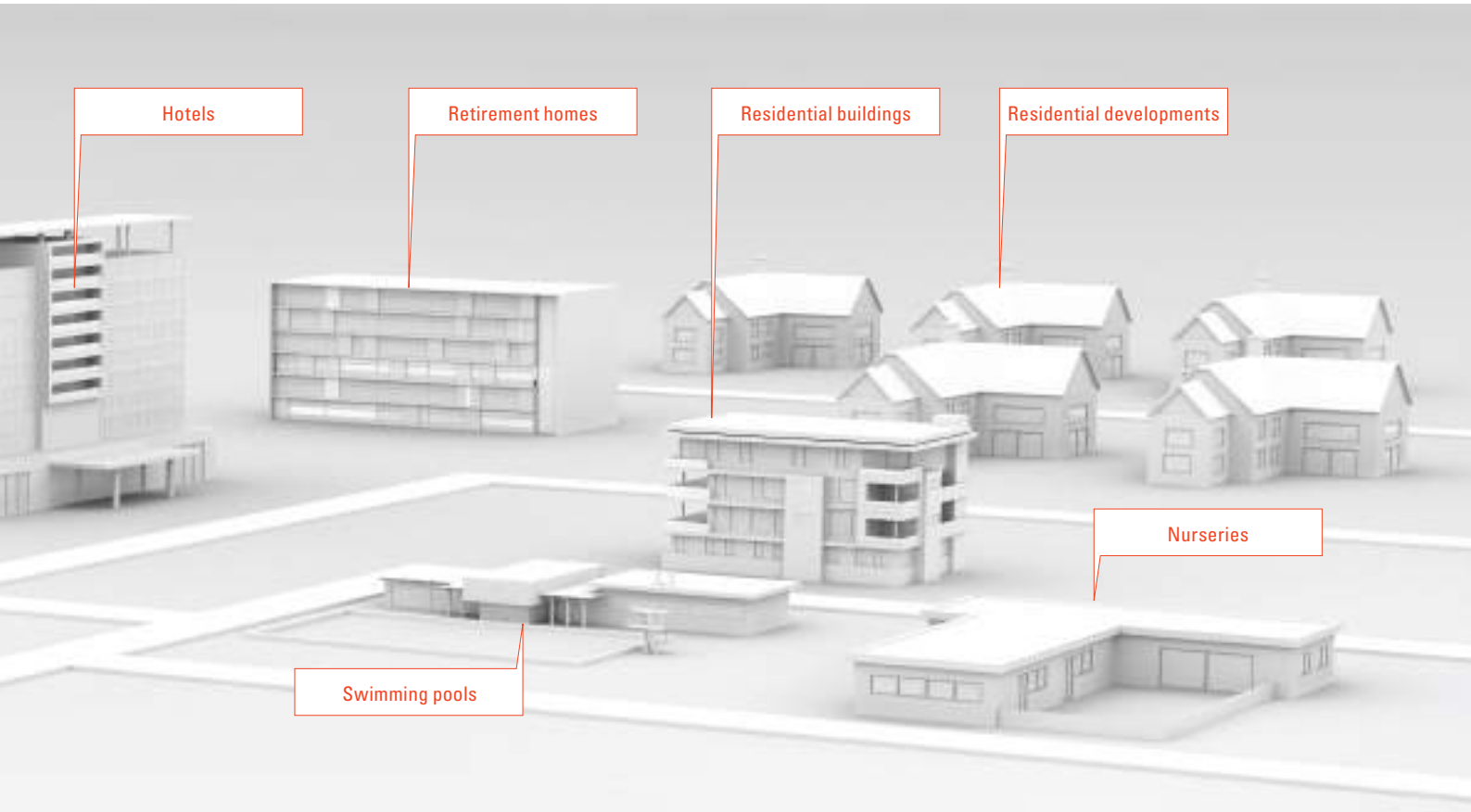
With more than 25 years of experience in this product area, Viessmann offers efficient gas-operated systems for combined heat and power generation. Alongside the standard products, the company also manufactures CHP units tailored specifically to customers' individual needs.

As standard, Viessmann offers a total of eleven different CHP unit ratings from 6 to 530 kW_{el}. This good range of compact module output levels means that the product range has the right system to suit all requirements.

CHP units for electricity and heat – places that will benefit from its use

- Schools and education institutions
- Nurseries and day-care centres
- Swimming pools, sports halls and arenas
- Event halls
- Hospitals, clinics and medical centres
- Industrial and commercial buildings
- Office and administration buildings
- Automobile workshops and service facilities
- Retirement homes and nursing homes
- Large residential buildings
- Complex residential developments
- Large-scale agricultural operations
- Hotels and restaurants

Combined heat and power generation is worthwhile wherever there is a parallel demand for electricity and heat.



Tailor-made energy concepts for applications requiring a medium output

With Viessmann, you can rely on over 25 years of experience in the planning, production and installation of efficient gas-operated combined heat and power generation systems.

The Viessmann Group is an international leader in the manufacture of systems for heating, industrial energy and cooling. In the field of CHP units, too, individual solutions are available with efficient systems and a wide range of outputs – to cover every need and every application. Viessmann CHP units impress with their high quality and good system integration. This means that operators can always be sure that their investment will also be worthwhile.

Complete supplier: simply more efficient by design

CHP units are the heart of an efficient electricity and heat supply. However, their efficiency can only come to bear in a well thought-out system. So it's a good thing that, as a complete supplier, the Viessmann range includes the entire system technology. From connection to the water and electricity supply to integration into the heating circuit to exhaust gas routing.

Vitobloc 200: completely ready for connection and factory-tested compact units – save time and money in planning, installation and commissioning.

CHP units for the combined generation of electricity and heat with an output range of 6 to 530 kW_{el}

High levels of efficiency included
Viessmann CHP units impress in terms of efficiency. Vitobloc 200 CHP units are particularly easy to maintain, with intervals of up to 6000 hours without oil refills being necessary. Some have integrated condensing boiler technology and, as a result, achieve total efficiency of up to 95 percent. They also have an electrical modulation capability of up to 50 percent and can be operated with either a heat or power bias.

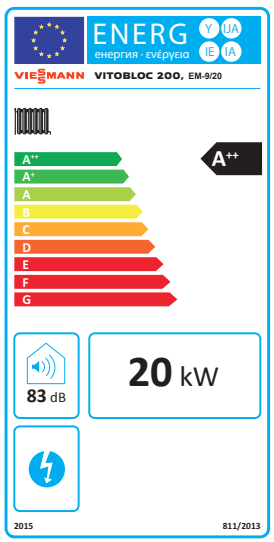
Other plus points of the Vitobloc 200 are its extensive range of technical features with an electricity meter and elastic connections for gas, exhaust gas, extract air and hot water, and the standard noise protection hood for much reduced noise levels during operation.

Take advantage of these benefits

- Experience: more than 3000 systems installed
- Low ancillary costs: the systems are designed for low planning and installation costs
- Modulation capability: Vitobloc 200 CHP units can be electricity-driven or heat-driven
- Safety: integrated hydraulic system separation
- Mains substitution mode: prepared as standard
- Public power grid: the grid operators' connection requirements for access are met as standard
- Flexibility: fuel-specific product configuration
- High availability: long maintenance intervals and large oil volume
- Tested quality: all models undergo a hot test at the factory
- Operational reliability: proven remote monitoring and automation concepts
- Service quality: comprehensive individual or standardised service concepts

Efficient heat and power supply with compact combined heat and power units

Gas engine units in natural gas operation



Energy efficiency at the highest level, shown by the energy label for the Viessmann CHP unit up to 20 kW

Combined heat and power unit Vitobloc 200 Module	**No. of cylinders/ arrangement**	**Output**[1] [kW] electrical[2] cos φ = 1.0	thermal[3] ± 7%	**Gas usage** [kW] DIN ISO 3046 ± 5%	**Process**
EM-6/15	3/in line	6	14.9	22.2	Lambda = 1[4]
EM-9/20	3/in line	8.5	20.1	30.1	Lambda = 1[4]
EM-20/39	4/in line	20	39	62	Lambda = 1[4]
EM-50/81	4/in line	50	83	145	Lambda = 1[4]
EM-70/115	6/in line	70	117	204	Lambda = 1[4]

Vitobloc 200
EM-6/15 module
EM-9/20 module
Energy efficiency class A++

Vitobloc 200
EM-20/39 module
Energy efficiency class A++

Vitobloc 200
EM-50/81 module
EM-70/115 module

Combined heat and power unit Vitobloc 200 Module	**No. of cylinders/ arrangement**	**Output**[1] [kW] electrical[2] cos φ = 1.0	thermal[3] ± 7%	**Gas usage** [kW] DIN ISO 3046 ± 5%	**Process**
EM-140/207	6/in line	140	209	384	Lambda = 1[4]
EM-199/263	6/in line	199	265	538	Lambda = 1[4]
EM-199/293	6/in line	199	293	533	Lambda = 1[4]
EM-238/363	12/V	238	366	667	Lambda = 1[4]
EM-260/390	12/V	263	390	693	Lambda = 1[4]
EM-401/549	12/V	401	552 + 28	1053	Lean turbo with mixture intercooler[5]
EM-530/660	12/V	530	660 + 38	1342	Lean turbo with mixture intercooler[5]

[1] Output acc. to DIN ISO 3046 part 1 (at 1000 mbar air pressure, 25 °C air temperature, 30% relative humidity, cos φ = 1)

[2] Electrical output at the generator terminals at cos φ = 1

[3] Available thermal output from coolant, lubricating oil and exhaust gas when cooled down to 120 °C (natural gas) or 150 °C (biogas); with the Vitobloc 200, type EM-6/15 and EM-9/20, cooled down to 60 °C (at 30 °C heating water temperature on entry into the module)

[4] Engines with three-way catalyst and operation with air ratios of Lambda = 1

[5] Engines with lean burn combustion, mixture charging and external mixture cooling

[6] Engines with lean burn combustion, mixture charging and internal mixture cooling

Vitobloc 200
EM-140/207 module

Vitobloc 200
EM-199/263 module
EM-199/293 module
EM-238/363 module
EM-260/390 module

Vitobloc 200
EM-401/549 module
EM-530/660 module

Full service available for every system – from planning through to maintenance

Viessmann CHP units are team players. They bring their maximum efficiency into a system that is individually tailored to the requirements of the respective application. This starts with the system technology, for example with control panels for overriding control functions, and continues on to tailor-made maintenance contracts.

Individual efficiency: tailor-made control panels, proven software

The demands placed on the control panel technology are different in practically every CHP unit. Viessmann offers tailor-made control panels and the software to go with them for every application: PLC, automation, grid coupling, auxiliary drives, control units or power units. Extensive experience pays off for operators: Every system is exactly tailored to the prevailing conditions in every application – thus guaranteeing optimum efficiency and reliability. This applies particularly to the renovation of existing CHP systems, but also, for example, to smaller boiler house control systems with remote monitoring.

Commissioning: economical from the start

Many parameters must be taken into account when commissioning a CHP unit. This starts with selecting the right location for the system and continues to the grid operator's information and on to the necessary installations and connection to the existing infrastructure. Viessmann experts are at your disposal in every phase of commissioning and will support you when it comes to meeting individual requirements right down to the fine parameterisation. This means that, right from the start, you can rely on your system's high availability. All Viessmann systems also have network capability. This means that both you and Viessmann technicians can see the status of your CHP unit at any time and intervene if necessary.

Before being delivered, every CHP unit must prove itself in practical test operations, in the course of which the specified performance values of each module are documented.

Viessmann service technicians bring along extensive know-how and great experience to make sure that things run smoothly on site.

Customer-orientated: optional services exactly as required
From commissioning to training to complete operational management – with Viessmann you have the complete package of services at your disposal. Operators can assemble their own individual service package from the options available, according to their particular demands and requirements.

Training: rely on the competence of your specialist company
Viessmann offers a planning seminar for CHP units that caters to planning offices and specialist heating companies. A special CHP unit computer supports participants in calculating both economy and dimensions.

Project planning: full support right from the start
Viessmann specialists are at the disposal of your specialist partner at all times for planning and project management.
They will assist with all questions relating to dimensioning by providing energy consumption data, economy observations or when public funds are applied for.

Full service: preserving value in the long term
Regular inspection and maintenance helps to maintain your CHP unit's value. To this end, Viessmann has drawn up various maintenance contracts, the intervals and scope of which can be adjusted to suit specific individual needs. Here you can choose between traditional maintenance, a service package with servicing or the complete package including servicing repairs – a complete all-round service with a balanced price-performance ratio.

Service inspection: the new "Service Plus" from Viessmann
The Viessmann service inspection includes on-site quality control of the maintenance and service work provided as well as a permanent analysis and expert evaluation of the system's condition. The inspection is supplemented by a customer satisfaction analysis. This means that we not only reduce the risk of failures, but also identify any training required by service technicians, thereby increasing the quality of the service work.

Connectivity: the best connection for high economic efficiency

Permanent service access is essential in order to guarantee optimum operation and the maximum possible level of availability. It's perfect when the CHP unit has a digital communications connection. That creates transparency for customers and service partners.

Whether it's a software update, a new requirement of the grid operator or optimisation of the system itself – digital interfaces allow speedy, uncomplicated and low-cost communication directly with the CHP unit. This is made possible by connecting the CHP unit to the internet.

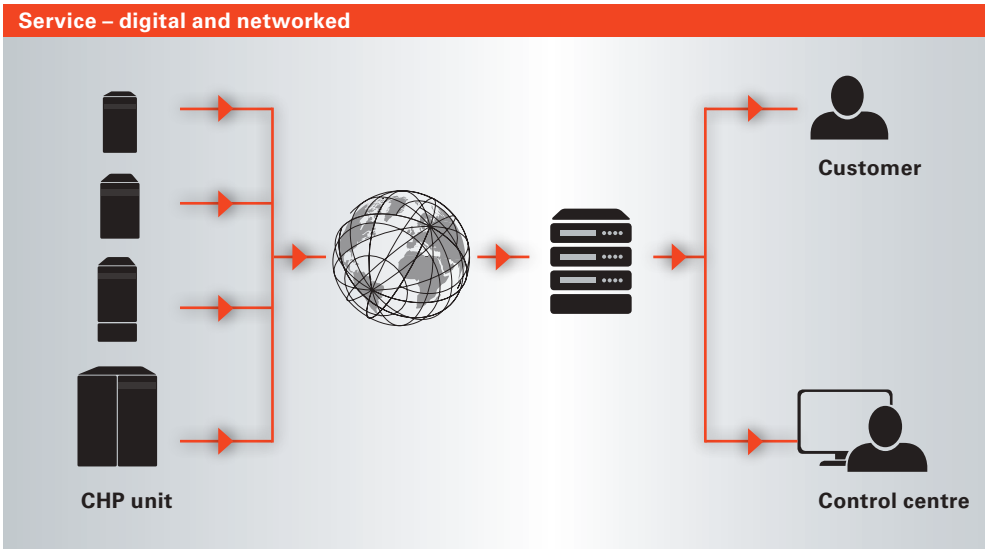
Always the right connection
The Viessmann TeleControl LAN enables every CHP system to be connected via the internet to the respective Viessmann service centre. This means that a lot of service work can be done without the service technician having to be on site.

Always the complete overview
In addition, access via the internet allows constant monitoring of the system state: the data can be called up from anywhere at any time by using an app on a PC, smartphone or tablet. Both you and Viessmann Service automatically receive all error and warning messages – perfect for planning maintenance work and for early fault detection. Daily reporting in the control centre is possible, as is connection to SAP for the automatic evaluation of, for example, operating hours.

Always the greatest possible availability
Failures and faults are largely avoided in conjunction with the preventative maintenance. For example, the automatic notification of unusual or conspicuous parameters and operating states. The automatic data analysis compares all available parameters with each other. In many cases, direct intervention in the system is possible and operation ensured. Retrofitting for existing systems also couldn't be easier: with LAN access to the system and a plug-and-play Telecontrol LAN unit in the existing control panel.

Data security: when hooking up to larger company networks, the collaboration between the Viessmann IT specialists and your IT department will ensure the greatest possible level of reliability for your network.

Service – digital and networked



Clear, uncomplicated, intuitively operable –
control of the Viessmann Vitobloc 200 mini CHP units.

Equipped for the future

Viessmann compact CHP units already meet the future demanding technical connection requirements of energy suppliers. For example, the synchronous generator and the intelligent control unit enable, among other things, variable setting of the phase offset via the software. And without hardware adaptations. The requirements of all European power grid connection conditions are also met.

Take advantage of these benefits

- Optimised system management thanks to permanent availability of all parameters
- Reliable and rapid availability as well as saving of all relevant data
- Preventative planning of maintenance and service work
- Early detection of faults and errors
- Data security thanks to the latest security standards
- Possibility of connecting to SAP systems

Reliability and economy: CHP units offer many advantages

Viessmann is a leader in the development and manufacture of CHP units with over 3000 systems already installed.

Park-Hotel Egerner Höfe

Centerparc Tossens

Inselbad Landsberg

Viessmann has many satisfied customers thanks to the comprehensive standard equipment level of its products. CHP units are not only the right choice for property developers investing in residential complexes and estates; their efficiency and economy make them equally attractive in many other applications. The most important areas in which Viessmann CHP units are used are:

- **Commerce and industry**
  Food processing, pharmaceutical and chemical industry etc.
- **Tourism**
  Guest houses, hotels etc.
- **Local and district heating associations**
  Municipal authorities, cities, contractors

Heating centre at the Park-Hotel Egerner Höfe
Following a complete renovation, some 68 percent of the total electricity demand is now covered by the CHP unit.
This system is exceptional for being entirely financed and operated by a contracting company. The entire heating system is operated internally as a local heating network.

- CHP unit:
  Viessmann Vitobloc 200 EM-140/207
- Gas condensing boiler:
  2 x Vitocrossal 200, type CT2
  (each 198 up to 593 kW)
- Heating water buffer cylinder:
  4 x 2200 litres
- CHP control unit:
  The system is equipped with Telecontrol remote monitoring and a Vitocom 300. This captures a wide range of data, including the buffer temperature, the discharging and charging by Wilo Stratos pumps via Wilo-Digicon as well as the information from heat meters.

Old Government House Hotel and Spa in Guernsey)

Viessmann Vitobloc CHP units were deemed as the best solution for the 5 star hotel, as well as the complexities of running on locally supplied LPG / air gas network. Two Vitobloc EM20 units were installed in the main hotel plant room by RefCO Limited and meet 60% of the hotel's base electricity load, whilst also supplying hot water to two Viessmann Vitocell 1,500 litre buffer vessels. This stored hot water feeds into the return heating main in the cascaded boiler plant, where it is integrated into the main hot water supply, heated swimming pool and health club facilities.

Old Government House Hotel and Spa, Guernsey

Grand Felda House, Wembley, London

Viessmann was chosen to work with the installer to provide a Vitobloc 200 combined heat and power unit, delivering 207 kW of thermal energy and 140 kW of electrical power. Specifically designed for use when there is a continuous need for electricity and heat, the Vitobloc 200 offers enormous savings potential as energy prices rise. It has an electrical modulation capability of up to 50%, meaning it can scale up or down to suit demand and can be operated with either a heat or power bias.

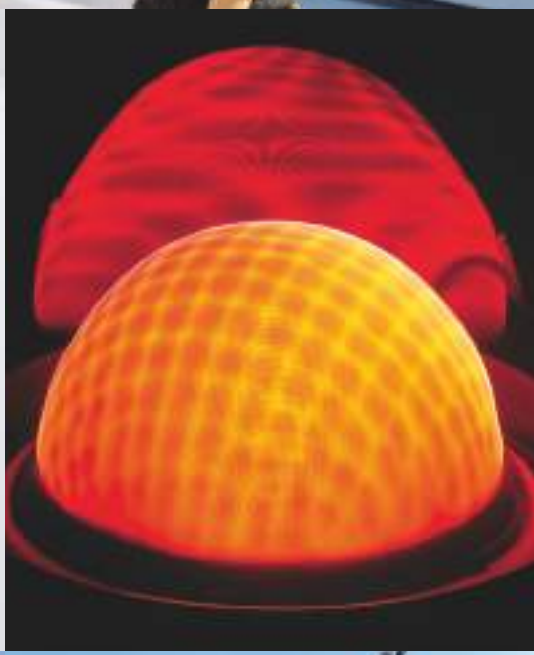
Grand Felda House, Wembley

Keele University, Staffordshire

The combination of CHP co-generation and gas is on course to save the university £34,000 per year in fuel bills, delivering a payback period of 9-10 years. The project also stands to save over 200,000 kg of CO^2 per year. Based on the success of the scheme, Keele university is now looking at installing further CHP units across the campus, hoping to cater for up to 25% of all energy requirements..

Keele University, Staffordshire

Viessmann Group



The company

Viessmann is one of the leading international manufacturers of efficient heating, industrial and refrigeration systems.

Acting in a sustainable manner
As a family business Viessmann takes the long view and places great value on acting responsibly; sustainability is firmly enshrined in the company's principles. For Viessmann, sustainability in action means striking a balance between economy, ecology and social responsibility throughout the company, meeting current needs without compromising the quality of life of future generations.

With its strategic sustainability project, Viessmann demonstrates at its own head office in Allendorf (Eder) that the energy and climate policy goals set by the German government for 2050 can in fact be achieved today with the help of commercially available technology.

The Viessmann comprehensive range
As environmental pioneer and technological trailblazer for the heating sector, Viessmann has for decades been supplying exceptionally clean and efficient systems for heating, refrigeration and decentralised power generation. Many of the company's developments are recognised as heating equipment milestones.

Practical partnership
As part of its comprehensive range, Viessmann also offers a wide selection of complementary services. These services include a comprehensive training and further development programme for trade partners at the well equipped training facilities of the Viessmann Academy.

With its new digital services, Viessmann offers innovative solutions such as the operation and monitoring of heating systems by smartphone. Users benefit from greater reassurance and convenience, whilst contractors can keep a constant eye on the systems for which they are responsible.

German Sustainability Award for Production/Brand/Resource Efficiency

Energy Efficiency Award

Viessmann Group

Company details
- Established in: 1917
- Employees: 12,100
- Group turnover: 2.37 billion euros
- Export share: 55 percent
- 23 production companies in 12 countries
- 74 countries with sales companies and branches
- 120 sales offices worldwide

The comprehensive product range from the Viessmann Group
- Boilers for oil or gas
- Combined heat and power generation
- Hybrid appliances
- Heat pumps
- Wood combustion technology
- Facilities for producing and reconditioning biogas
- Solar thermal
- Photovoltaics
- Electric heating and DHW systems
- Refrigeration systems
- Accessories

Viessmann Limited
Hortonwood 30, Telford
Shropshire, TF1 7YP
Tel: 01952 675000
Fax: 01952 675040
www.viessmann.co.uk

Your trade partner:

9443 154 GB 08/2018

Copyright protected content
Duplication and alternative use only with prior written consent.
Subject to modifications.