



TECHNOLOGY BROCHURE

Power-generating heating systems **VITOTALOR**

**Efficient, economical,
futureproof**

Reliable and proven
technology – consume
self-generated power
in your home and make
yourself independent of
rising electricity costs



efficient
intelligent
resource-
sparing
independent



Power-generating heating systems have the potential to save on large amounts of fossil fuels and make an active contribution towards protecting the environment. In addition, they make users largely independent of the public grid and protect them from rising electricity costs. Viessmann offers efficient solutions in this area based on the principle of cogeneration:

The Vitovalor PT2 generates heat and power at the same time and is designed for new build and comprehensive modernisation in detached and two-family houses. In addition to the fuel cell module, the standard unit contains a gas condensing boiler to cover peak loads. The useful integral DHW cylinder with a capacity of 220 litres completes this energy system.

The Vitovalor PA2 is suitable for upgrading existing heating systems in detached houses, apartment buildings and small commercial operations. The heat produced during power generation is efficiently used to charge a heating water buffer cylinder.



The Vitocalor PA2 and Vitocalor PT2 will be available in the elegant Vitoppearlwhite design as of April 2019.

Design awards for the Vitocalor PT2

DESIGN PLUS

powered by: **ISH**



| | Vitocalor PT2 | Vitocalor PA2 |
|--|---------------|---------------|
| Quick and simple installation | + | + |
| For new build and full modernisation (detached houses) | + | - |
| Supplements the existing heating system in detached houses and apartment buildings | - | + |
| High level of independence from the public grid | + | + |
| Integral gas condensing boiler | + | - |
| Energy cockpit indicates electricity yield and consumption of electricity and gas | + | + |
| Convenient operation with ViCare app via smartphone | + | - |
| Subsidies of up to €11,100 (CHP Act: €1800 plus KfW programme 433: €9300) | + | + |
| Access to the ViShare Energy Community | + | + |

Fuel cells for on-site power generation – optionally with integral heat generator

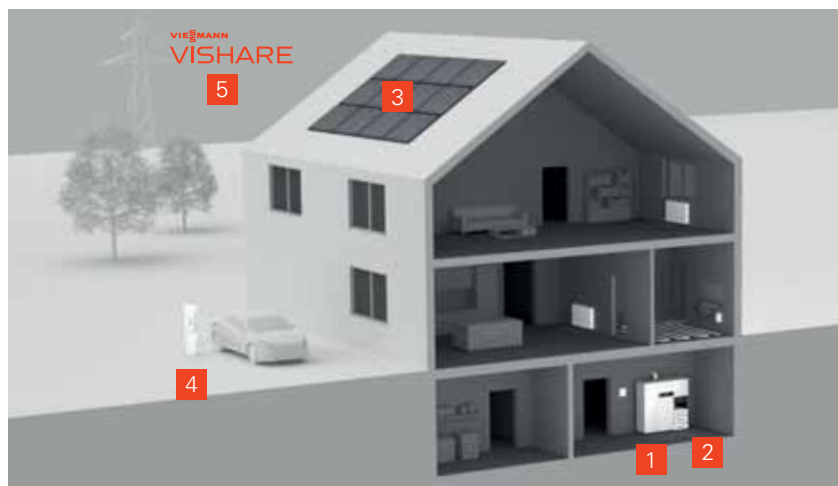
Vitotalor PT2 – the combined heat and power solution for new build and modernisation

The Vitotalor PT2 fuel cell heating appliance from Viessmann has been on the market for five years and has proven itself as a reliable energy system. It generates heat and power at the same time and is designed especially for new build and comprehensive modernisation in detached houses.

In addition to the fuel cell module, the standard unit also contains a gas condensing boiler with a heating output of up to 30.8 kW to cover peak loads. The DHW cylinder provided has a capacity of 220 litres.

Vitotalor PA2 – on-site power generation for retrofit projects

The Vitotalor PA2 is based on the Vitotalor PT2 fuel cell module. The fuel cell is specially designed to extend existing heating systems in detached houses and apartment buildings. The heat generated during its operation is efficiently used to charge a heating water buffer cylinder.



Renewable energy system with Vitotalor PT2 fuel cell heating appliance, Vitocharge power storage unit and Vitovolt photovoltaic system, for a high level of independence from public power supply utilities.

SYSTEM COMPONENTS

- 1** Vitotalor PT2 fuel cell heating appliance with DHW cylinder
- 2** Vitocharge power storage system
- 3** Vitovolt photovoltaic system
- 4** Electric charging point
- 5** ViShare Energy Community

Generate your own electricity and become less dependent on the public grid

The electrical output of the two appliances is 0.75 kW. This produces up to 18 kWh of electricity per day, which covers most of a household's needs (consumption of between 15 and 20 kWh is normal). The user achieves a degree of self-sufficiency of up to 60 percent, becoming largely independent of mains electricity and its rising costs.

Service packs guarantee a long service life

The fuel cell has a guaranteed service life of 10 years. This corresponds to around 80,000 hours of operation. However, the module can run for up to 20 years, requiring maintenance once every 5 years. After maintenance, operation of the fuel cell is assured for a further five years.

When optimally integrated into an energy system, the fuel cell generates up to 6000 kWh of electricity per year. This corresponds to energy savings of up to €800.



The Vitotalor PT2 fuel cell heating appliance with a thermal output up to 30.8 kW offers great flexibility and many application options. The compact Vitotalor PT2 requires a footprint of only 0.72 square metres. The front-mounted control unit and pre-installed components for hydraulics and sensors complete the package. With the 7" colour touchscreen, operation is considerably easier. The unit has an integral 220 l stainless steel DHW cylinder.

Ideal for detached and two-family houses

Up to a heat demand of 32,000 kWh per year and an annual power demand of up to 6000 kWh, the Vitotalor PT2 offers sufficient power for a detached or two-family house.

The maximum amount of electrical energy generated over the course of the day (up to 18 kWh) is enough to cover the basic needs of an average household.

The Vitotalor PT2 produces power for up to 45.5 hours without interruption. Following this, the fuel cell regenerates for 2.5 hours and is then available again to produce power. The integral gas condensing boiler switches on automatically when the heat generated by the fuel cell module is insufficient, such as at peak times or when a lot of hot water is required for a brief period.

Anticipates your needs: self-learning energy manager

The fuel cell heating appliance has a bias towards producing heat and has been optimised for power generation. The integrated energy manager is adaptive and responds to your individual requirements. This means that it only starts the fuel cell heating appliance when it is worthwhile, i.e. when sufficiently long runtimes, and therefore corresponding power generation and on-site utilisation, are expected.



Vitotalor PA2 fuel cell retrofitted in a system with a Vitocrossal 300 gas condensing boiler and Vitocell heating water buffer cylinder

The Vitotalor PA2 fuel cell is the ideal addition to an existing heating system. With this proven appliance, users generate their own power, giving them a high degree of self-sufficiency. They become largely independent of the public grid and, therefore, of rising electricity costs.

Also suitable for apartment buildings

The Vitotalor PA2 supplies sufficient electricity for an annual power demand of up to 6000 kWh. The electrical energy of up to 18 kWh produced in the course of the day covers a large part of the basic requirements of a detached house and is also suitable for supplying apartment buildings with electricity.

Using heat generated during operation

The heat generated by the fuel cell can be used efficiently for heating. We recommend installing a Vitocell 100-E heating water buffer cylinder, which is available in 600 to 900 litre versions.

Low installed height and flexible connection options

With an installed height of only 1600 millimetres, the fuel cell can also be installed in rooms with low ceilings. If there is already a Vitodens boiler with a heating output of up to 26 kW in the house, the Vitotalor PA2 does not need its own flue system.

Ultimate operating convenience with a modern 7" colour touchscreen

The generous 7" colour touchscreen delivers the ultimate level of operating convenience. For example, users can check their energy cockpit to see their consumption and electricity yield at any time.

Reliable and durable

As with all innovations from Viessmann, reliability and durability are top priorities when it comes to the Vitotalor PA2. The fuel cell stack developed by Panasonic is designed for a service life of ten years. This corresponds to around 80,000 hours of operation. Maintenance of the module is required only once every five years. Service packs tailored to the appliance are available for this purpose.



Fuel cell heating appliance VITOTALOR PT2

10 year guarantee

on stainless steel heat exchangers for oil or gas condensing boilers up to 150 kW

For all conditions, see www.viessmann.de/garantie

| Vitotalor PT2 | Type | F11T | F19T | F25T | F32T |
|---|----------------|---------------------------------------|------------|------------|------------|
| Rated heating output (60/40 °C) | kW_{th} | 0.9 – 11.4 | 0.9 – 19.0 | 0.9 – 24.5 | 0.9 – 30.8 |
| Electrical output of fuel cell | W_{el}^* | 750 | 750 | 750 | 750 |
| Thermal output of fuel cell | kW_{th}^* | 1.1 | 1.1 | 1.1 | 1.1 |
| Sound power level | dB(A) | 48 | 49 | 50 | 51 |
| Electrical efficiency of fuel cell | % | 37 | | | |
| Overall efficiency of fuel cell | % | Up to 92 (H ₂) | | | |
| Standard seasonal efficiency [to DIN] – peak load boiler | % | Up to 98 (H ₂) [gross cv] | | | |
| Stainless steel DHW cylinder | l | 220 | | | |
| Fuel | | Natural gas E(H) / LL(L) | | | |
| Dimensions excl. flue system | | | | | |
| Length (depth) x width x height | | | | | |
| – Complete unit | mm | 595 x 1200 x 1800 | | | |
| – Standard unit | mm | 595 x 600 x 1800 | | | |
| – Tower cylinder | mm | 595 x 600 x 1800 | | | |
| Minimum required room height | | 2000 | | | |
| Weight | | | | | |
| – Total weight | mm | 326 | | | |
| – Standard unit | mm | 197 | | | |
| – Tower cylinder | mm | 129 | | | |
| Space requirement | m ² | 0.72 | | | |
| Energy efficiency class | | | | | |
| – Heating | | A+++ | A+++ | A+++ | A++ |
| – DHW heating, draw-off profile XL | | A+ | A+ | A+ | A+ |

* Output data: standard value to EN 50465

TAKE ADVANTAGE OF THESE BENEFITS

- + Parallel generation of heat and power to minimise electricity costs
- + High level of independence from the public grid
- + Ideally suited to use in detached and two-family houses
- + Up to 50 percent reduction in CO₂ emissions compared to separate power and heat generation
- + Service pack over ten years ensures reliable operation
- + Low costs for maintenance and spare parts thanks to long maintenance intervals (5 years)
- + Integral electricity, gas and heat metering calculations (to provide billing information for state subsidies and energy tax rebates)
- + Energy cockpit indicates electricity yield and consumption of electricity and gas
- + Convenient operation with ViCare app and smartphone
- + Simple and rapid installation due to fully integrated hydraulics (similar to gas condensing boilers); only one flue system required
- + Government subsidies of up to €11,100 (CHP Act: €1800 plus KfW programme 433: €9300)



Fuel cell heating appliance **VITOTALOR PA2**

| | | |
|-------------------------------------|--------------------|--------------------------|
| Vitotalor PA2 | Type | E00T |
| Electrical output | kW _{el} * | 0.75 |
| Sound power level | dB(A) | < 50 |
| Electrical efficiency | % | 37 |
| Fuel | | Natural gas E(H) / LL(L) |
| Dimensions excl. flue system | | |
| Length (depth) x width x height | mm | 595 x 600 x 1600 |
| Minimum required room height | mm | 1800 |
| Weight | kg | 140 |
| Energy efficiency class | | A+++ |

* Output data: standard value to EN 50465

TAKE ADVANTAGE OF THESE BENEFITS

- + Generate and consume your own power, and save on energy bills
- + Environmentally responsible – significant CO₂ reduction
- + Ideal addition to an existing heating system
- + Thermal output: 1.1 kW
- + Designed for applications in detached houses, apartment buildings and small commercial operations
- + Integral electricity, gas and heat metering calculations
(to provide billing information for state subsidies and energy tax rebates)
- + Energy cockpit indicating power generation and consumption
- + Simple combination with heating water buffer cylinders
(Vitocell 100-E, Vitocell 140-E or Vitocell 340-M combi cylinder)
- + Low costs for maintenance and spare parts thanks to long maintenance intervals (5 years)
- + Service pack over ten years ensures reliable operation
- + High subsidies of up to €11,100
(CHP Act: €1800 plus KfW programme 433: €9300)

Double the savings:
generate heat and power simultaneously



With a power-generating heating system, you benefit twice over from the energy the system uses. The heat produced almost as a by-product during power generation is used for central heating or DHW heating. This significantly reduces your energy bills by up to 40 percent and protects the environment. With the Vitovalor PT2 and PA2 fuel cells, you can choose between two highly efficient systems that have been perfectly designed for new build and modernisation projects in detached and two-family houses and small commercial operations.

Storing power for later use

Power-generating heating systems from Viessmann produce sufficient power for a family of four. They often even generate more than required. Where that is the case, the surplus is simply stored in the optional Vitocharge power storage system to be drawn upon later. You will find more on power storage units on page 14 onwards.

Generate up to 85 percent of your own power

The powerful Vitovalor PT2 and PA2 fuel cells can cover the base load of the power demand for a detached or two-family house. They only draw power from the grid at peak times. In combination with a photovoltaic system and power storage unit, you can achieve up to 85 percent independence from external power supply utilities.

Lower your energy bills

On-site power generation puts you on the fast track to savings. After all, by using power generated on site you can considerably lower your electricity bills and give ever rising electricity prices the cold shoulder. In fact, you can even earn money by exporting power to the grid if you generate more than you use.

Sample calculation

Simple calculation, clear benefits: a power-generating heating system is a worthwhile investment.

This calculation illustrates the average savings achievable with a Vitovalor PT2 in a new build.

Sample calculation: annual saving from power generation with the Vitovalor PT2

| | |
|--|---|
| Assuming a cost of 2.31 cents for each kWh of power generated on site results in an electricity price of | 25 ct/kWh |
| If put to best use, the fuel cell can generate 18 kWh of power per day (6200 kWh/year). Power generation of 4000 to 4500 kWh is assumed in a "typical" detached house. | 4200 kWh |
| Approx. 60 percent of the power generated on site can now be used in this "typical" detached house. This amounts to: 2520 kWh x €0.25 per kWh = €630 p.a. | €630 (max. €1000 to €1550 achievable with 100 % on-site consumption) |
| From the power exported, we receive: 1680 kWh x €0.05 per kWh = €84 | €84 |
| Annual energy cost savings | Up to €800 |



Generate power and store it efficiently. Viessmann offers perfectly matched systems for this. You can then use the power you generate when you need it – for your electric car, for example.

The ideal combination for greater independence and lower energy costs

- 1 **Vitovalor PT2**
With up to 30.8 kW thermal output, this fuel cell heating appliance can cover the heat demand of a detached house. The electrical energy generated each day (up to 18 kWh) is enough to satisfy the demands of an average household.
- 2 **Power storage unit**
Vitocharge power storage units store self-generated power. This is then available later when it is needed. The modular design enables flexible sizing of the storage unit as required.
- 3 **Photovoltaics**
In addition, the high performance photovoltaic system generates power from free solar energy. The fully assembled modules impress through their reliability and long service life.

BENEFITS IN NEW BUILD

- + Lower your future energy bills
- + Save up to €800 in energy costs each year
- + Achieve up to 85 percent independence with a CHP system, small photovoltaic system and power storage system

BENEFITS IN MODERNISATION PROJECTS

- + Enjoy greater independence from ever rising electricity prices
- + Lower your future energy bills
- + Save up to €800 in energy costs each year
- + Achieve up to 85 percent independence with a CHP system, small photovoltaic system and battery storage unit
- + Improve your energy performance certificate

Investing made simple: through attractive state subsidies



Advice and access to sales, installation and customer service support: Viessmann trade partners receive regular training and have in-depth knowledge of our products. Expertise that you can benefit from, too.

In Germany, power-generating heating systems have long been recognised as an efficient, futureproof form of technology, which is why they are eligible for attractive state subsidies.

Comprehensive and clear: subsidy and application guide

In the subsidies and applications guide, you will find all the necessary forms for approvals and subsidies for your power-generating heating system. You will also find information about which applications must be submitted and by when, in order to meet all the requirements for the subsidy. The guide is available online at www.viessmann.de

Fully prepared and ready to go: applications to power supply utilities and BAFA

The CHP bonus is deducted directly from your electricity bill, so applications need to be sent to your power supply utility before and after commissioning. All applications, required evidence and the maintenance log in the Viessmann guide are valid throughout Germany and have been completed for you, so all you need to do is send them off. The guide also contains step-by-step instructions

on completing the electronic registration form for the Federal Office for Economic Affairs and Export Control (BAFA).

Benefits year after year: electricity subsidy and energy tax rebate

The total amount of electricity must be reported to the utility by 31 December each year. It is worthwhile, as the subsidy according to the German CHP Act is 8 cent/kWh for power exported to the grid and 4 cent/kWh for power consumed on site. Furthermore, under the energy tax law (EnergieStG), your energy tax payments are refunded to you at the end of the year. Germany's state governments and power supply utilities also offer numerous subsidy programmes. A complete overview and detailed information can be found on the internet at www.viessmann.de.

Viessmann FörderProfi

Viessmann FörderProfi is the homeowner's fast route to public subsidies without the tedious paperwork. If required, FörderProfi handles everything, right through to payment of the subsidy. More at service.viessmann.de/foerderprofi

Practical tips Save 19 % VAT

As a power generator, you can register as a small business. Discuss this with your tax advisor.

YOUR TRADE PARTNER SERVICE

- + Tailor-made advice, even on site
- + Calculation of the power, DHW and heat demand for the household or property
- + Clear calculation of savings on heating costs and power
- + Calculation of the payback period, after which the Vitovalor PT2 or PA2 will have paid for itself through energy savings
- + Support with applying for subsidies

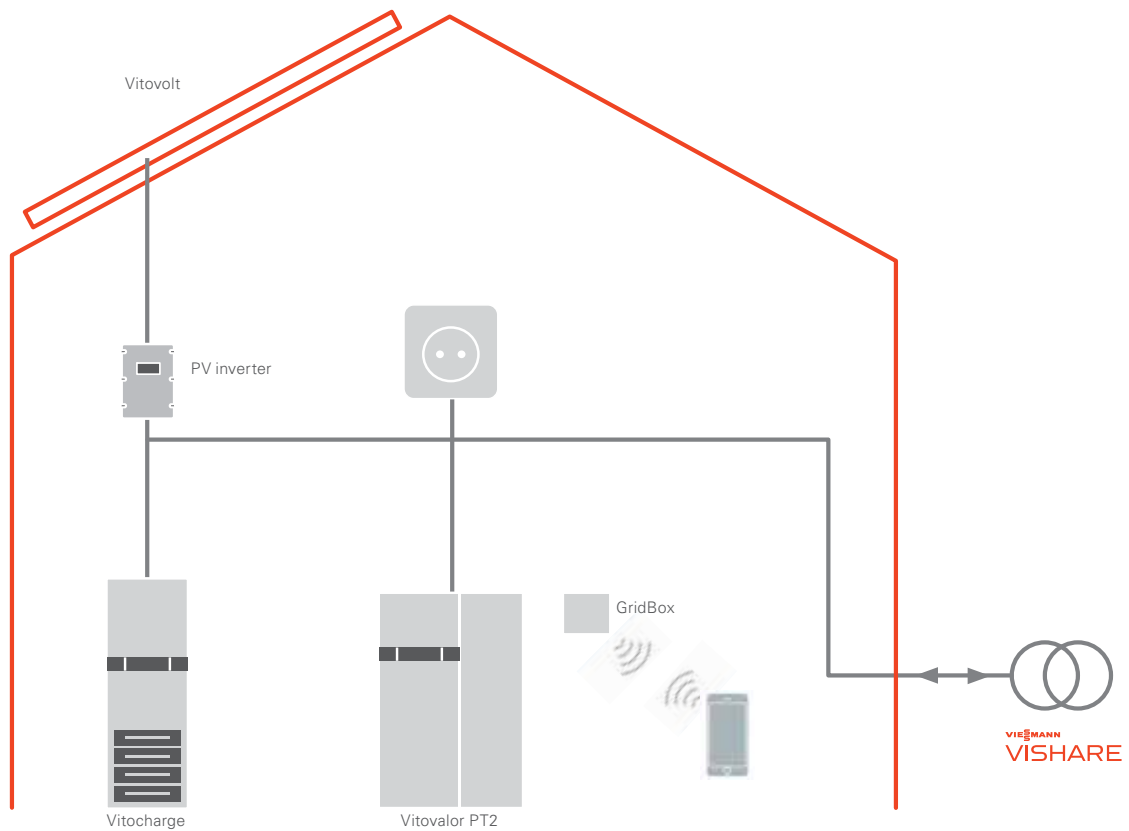
Public subsidies

€11,100

for the Vitovalor PT2 or PA2*

* CHP Act: €1800 plus
KfW programme 433: €9300

Combined heat and power generation often produces more electricity than a detached house needs at any particular time. The Vitocharge power storage system is therefore an ideal supplement.



With the Vitocharge power storage system, self-generated power is available when needed.

Independence has priority: storing power for later use

Power-generating heating systems from Viessmann produce sufficient power for a family of four. They often even generate more than required. Where that is the case, the surplus is simply stored in the Vitocharge power storage system to be drawn upon later.

You currently receive up to €0.11/kWh for electricity exported directly to the grid, and pay up to €0.28/kWh for electricity drawn from it. It therefore makes great economic sense to store self-generated power.

Viessmann offers power-generating heating systems and the power storage system from a single source. This means that all components are perfectly matched to one another and work with great efficiency and reliability.

Short payback period, long service life: you can't go wrong

Vitocharge battery modules are designed for a service life of more than 6000 charging cycles. Assuming an on-site consumption rate of over 80 percent, the payback period is less than ten years. You can then benefit from virtually free, self-generated power for a long time to come.



The power storage system offers a charging infrastructure for electric vehicles

Modular storage system

Different power generators and varying power consumption requirements mean that power storage units must be available in a range of sizes. This is why the Vitocharge power storage unit is modular in design. A single unit can accommodate up to four battery modules, each with a storage capacity of 3.87 kWh – up to 15.5 kWh in total. They are particularly straightforward to install. The battery modules slot into the unit like drawers and start up automatically.

High capacity

As a single phase power storage system, the Vitocharge is designed for cost effective on-site consumption optimisation. In combination with the optional Vitovalor, the Vitovalor PT2 and PA2 provide backup during power failures. In this scenario, the system switches to mains substitution mode and continues to supply all of the electrical appliances in the home.

Large and clearly laid out: the display

The large screen in the programming unit displays various symbols that provide information at a glance on prevailing charging and operating conditions. One feature of particular interest to users is the display that shows when they have achieved self-sufficiency, i.e. their home is supplied without drawing additional electricity from the public grid. When this occurs, the screen shows mains consumption as 0.0 kW.

Perfect team: complement the installation with a photovoltaic system

As less heat is required in summer, less electricity is generated as well. In order to remain as independent of the public power grid as possible, the ideal solution is to integrate a PV system. This will cover the entire power demand in summer.



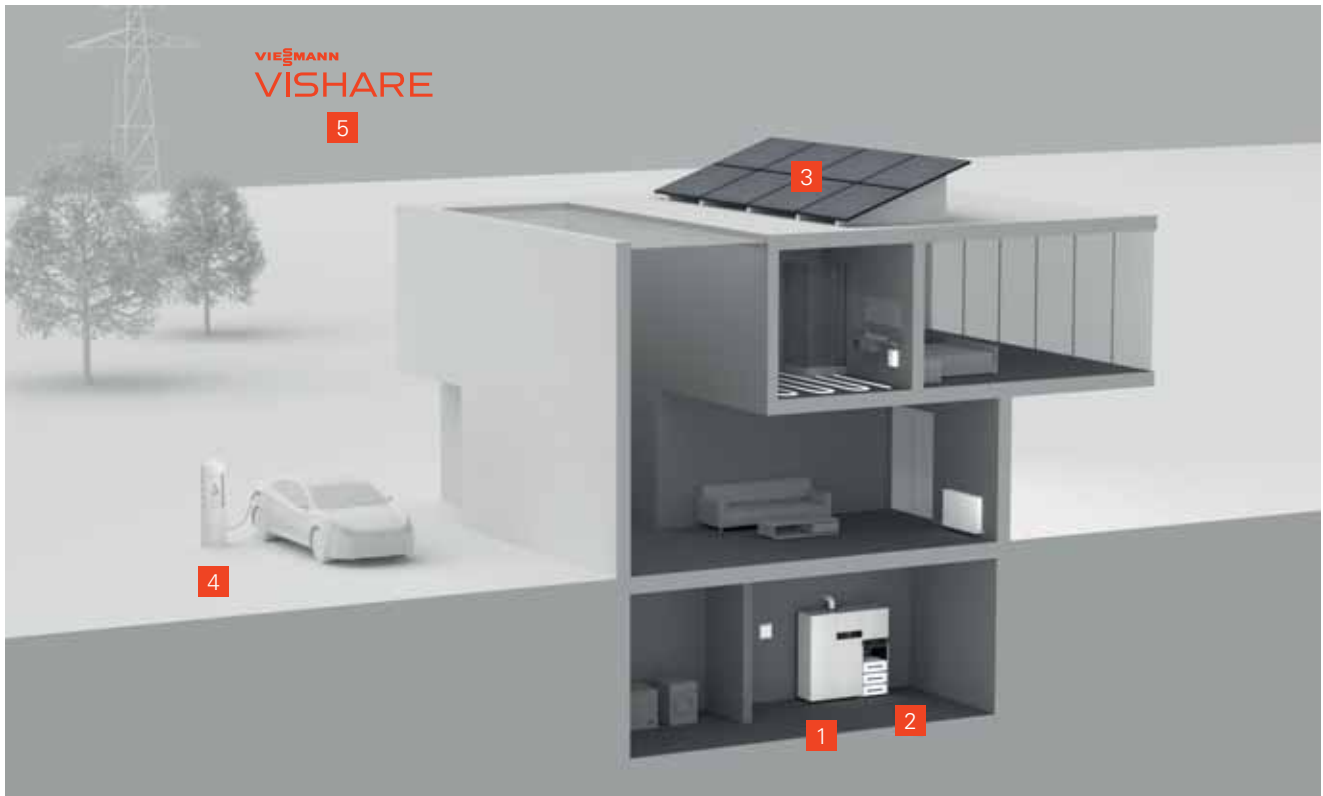
The Vitocharge has a storage capacity of up to 15.5 kWh.



Everything you need to know at a glance: for example, the display screen shows when the power generated on site is making your home fully independent of the public grid.

TAKE ADVANTAGE OF THESE BENEFITS

- + Greater independence from power supply utilities and rising electricity prices
- + Lower electricity bills thanks to optimised consumption of power generated on site
- + Continued supply during power failure with mains substitution mode (changeover box required as an accessory)
- + Straightforward installation thanks to pre-assembled unit
- + Battery modules are simply slotted into place (plug & play)
- + Individual configuration, ideal supplement to existing energy systems
- + Charging infrastructure for electric vehicles



SYSTEM COMPONENTS

- | | |
|---|---|
| <p>1 Vitovalor PT2 fuel cell heating appliance with DHW cylinder</p> <p>2 Vitocharge power storage system</p> | <p>3 Vitovolt photovoltaic system</p> <p>4 Electric charging point</p> <p>5 ViShare Energy Community</p> |
|---|---|

System technology ensures reliable and economical operation. The convenient controls and perfectly matching Viessmann system components offer maximum reliability, flexibility and efficiency.

"The whole is greater than the sum of its parts." In accordance with this philosophy, Viessmann does not simply supply individual heating equipment components that meet the high Viessmann standards for quality, reliability and effectiveness. In addition, all products are part of a matching overall concept, where all components

complement one another. After all, only perfect interaction between all system parts can draw out the maximum potential of our innovative leading technology.

Viessmann system technology incorporates everything you need for a reliable and economical heating system:

namely the control unit with wireless remote control and online management using the ViCare app, powerful Vitocell DHW cylinders for the highest DHW convenience, and high grade photovoltaic systems.



CONNECTIVITY

With a smartphone, the operation of your Viessmann heating system couldn't be easier. Viessmann apps are available for iOS and Android operating systems.



DHW CYLINDERS

DHW convenience for every demand: Viessmann offers plenty of choice with its range of Vitocell cylinders. Here, you will find exactly the right DHW cylinder to suit your requirements – depending on water demand and installation options.



VISSMANN FÖRDERPROFI

The online FörderProfi service from Viessmann significantly simplifies the subsidy process, making everything digital, from the application to payment.



SYSTEM ACCESSORIES

We also offer system components from other well known manufacturers with the Vitoset range of accessories. You benefit because everything matches and can be combined to meet your individual requirements.



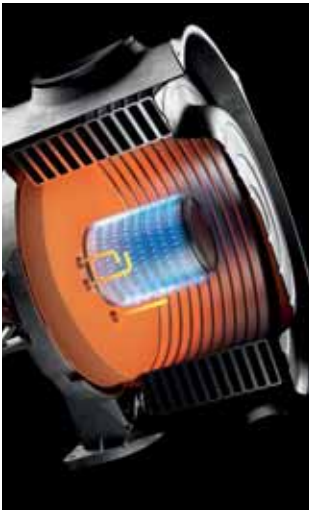
PHOTOVOLTAIC SYSTEM

The sun supplies energy that can be turned into electricity. This is economical – generating solar power is already significantly cheaper than drawing domestic power from the grid.



VISHARE ENERGY COMMUNITY

Households that produce and consume energy team up to create a smart network. Surplus electricity is provided to the community and drawn as required. Nothing is wasted and the members gain in self-sufficiency.



MatriX-Plus burner

Viessmann comprehensive range

- Boilers for oil or gas
- Combined heat and power generation
- Hybrid appliances
- Heat pumps
- Wood combustion technology
- Biogas production plants
- Biogas upgrading plants
- Solar thermal
- Photovoltaic
- Electric heating/DHW systems
- Refrigeration systems
- Accessories

Milestones of heating technology

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

Sustainability in action

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.



We create living spaces
for generations to come.



Number 1 Trade Partner for the 15th consecutive time

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.



Viessmann is a leading international manufacturer of efficient energy systems.

VISSMANN GROUP IN FIGURES

1917

— Viessmann was founded

12,000

— employees

2.5

— Group turnover in billions of euros

54

— export share in percent

23

— production companies in

12

— countries

120

— sales offices worldwide

74

— countries with agents and sales companies



Viessmann Werke GmbH & Co. KG
35107 Allendorf (Eder)
Germany
Telephone +49 (0)6452 70-0
www.viessmann.com

Your trade partner

9442 864 - 4 GB 04/2019

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