Technical description

VITOBLOC 200 Type EM-20/39
Part no. 7727270
Combined heat and power unit
for natural gas and LPG operation
in accordance with the requirements of the
EU Gas Appliance Regulation and
EU Machine Directive
Electrical output 20 kW
Thermal output 39 kW
Fuel use 62 kW
Condensing technology
with optimised emissions
This appliance meets all basic requirements of the applicable standards and guidelines. Conformity has been verified. All associated documents and the original Declaration of Conformity are available from the manufacturer.

**NOTE**
The Vitobloc 200 CHP unit is not suitable for 60 Hz operation. It is therefore not available in certain markets, in particular America and Canada.

### Important general application notes

Use this technical equipment only for its intended purpose and according to the installation, operating and service instructions. Maintenance and repairs may only be performed by authorised contractors.

Use this appliance only in those combinations and together with those accessories and spare parts indicated in the installation, operating and service instructions. Only use other combinations, accessories and wearing parts if they are designated explicitly for the intended application and they do not adversely affect performance characteristics or safety requirements.

### Subject to technical modifications

This is part of the original operating instructions. Constant development may lead to minor deviations in the illustrations, functional steps and specifications from those described/shown.

### Depiction of notes

The notes in this documentation are important for safety and must be observed.

**DANGER!**
This symbol warns against the risk of injury.

**PLEASE NOTE:**
This symbol warns against the risk of material losses and environmental pollution.

**NOTE**
This symbol indicates information that will simplify work and ensure safe operation.
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General information

1 General information

1.1 Purpose

The combined heat and power (CHP) unit is a complete, fully wired unit with an air cooled synchronous generator for generating 400 V, 50 Hz, three-phase power and domestic hot water.

<table>
<thead>
<tr>
<th>Standard equipment and product features</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Mains parallel and mains substitution mode (in the event of power failure) as standard.</td>
</tr>
<tr>
<td>- Meets the stringent technical connection conditions specified by power supply utilities (TAB) without inverter.</td>
</tr>
<tr>
<td>- Flexible control – in heat bias mode, power modulation 50 % - 100 %; in mains substitution mode, power modulation 0 % - 90 %</td>
</tr>
<tr>
<td>- Internal lubricating oil supply system designed for a service interval of 6000 h.</td>
</tr>
<tr>
<td>- Integral condensing technology for maximum overall efficiency. Due to the optimised design of the internal cooling circuit, no heating water return temperature raising facility is required.</td>
</tr>
<tr>
<td>- Reliable Gas-Otto-Engine, series product of the factory supplier.</td>
</tr>
<tr>
<td>- Synchronous three-phase generator with low harmonic content for optional mains substitution mode in island systems.</td>
</tr>
<tr>
<td>- Exhaust gas cleaning system for achieving NOx values in line with TA-Luft 2002 with a regulated 3-way catalytic converter.</td>
</tr>
<tr>
<td>- Gas train according to DVGW and DIN 6280 part 14, including thermal shut-off valve and gas ball valve.</td>
</tr>
<tr>
<td>- Design in accordance with the EU Gas Appliance Regulation 2016/426 and EU Machine Directive with production in accordance with DIN ISO 9001.</td>
</tr>
<tr>
<td>- Factory test run with complete CHP unit (engine, generator, heat exchanger, control panel) according to DIN 6280, part 15.</td>
</tr>
<tr>
<td>- Control system integrated into CHP unit for optimum space utilisation. No additional space required; no additional cabling.</td>
</tr>
<tr>
<td>- Control system as per VDE-AR-N 4105, including generator power unit, control, monitoring and auxiliary drive unit with mains protection and microprocessor control unit.</td>
</tr>
<tr>
<td>- Certified according to the Power Supply Directive VDE-AR-N 4105.</td>
</tr>
<tr>
<td>- Data transfer via interface DDC for transferring the CHP parameters to the building management system as hardware module RS 232 with data protocol 3964 R (without RK512).</td>
</tr>
<tr>
<td>- Telecontrol system with terminals for the transfer of operating and central fault messages via floating contacts to the on-site building management system.</td>
</tr>
<tr>
<td>- Fault history memory for recording complete fault chains to obtain specific fault analyses.</td>
</tr>
<tr>
<td>- Extract air fan with a maximum pressure of 1 mbar for the extract air duct.</td>
</tr>
<tr>
<td>- Heat exchanger built and tested according to the Pressure Equipment Directive 2014/68/EU.</td>
</tr>
<tr>
<td>- Exhaust gas heat exchanger protected from failure due to poor heating water quality, corrosion and cavitation by integrating it into the engine's internal coolant circuit.</td>
</tr>
<tr>
<td>- Technical documentation in the national language included as hard copy.</td>
</tr>
</tbody>
</table>

Tab. 1 Standard delivery, standard equipment level
General information

1.3 Continuous output in mains parallel mode

Refer to Chapter 4 “Specification” for performances and efficiencies.

The outputs and efficiencies correspond to standard ISO 3046/1, at 25 °C air temperature, 1000 mbar air pressure (up to 100 m height above sea level), 30% relative humidity and methane number 80, reactive factor cos phi = 1 and heating water inlet temperature into the unit of 40 °C. The tolerance for all efficiencies and heating outputs is 7%. The tolerance for energy input is 5%.

Primary energy savings as per EU CHP Directive

The amount of primary energy saved is the percentage saving made in fuel due to combined heat and power generation within a CHP process compared with the fuel heat consumption in reference systems with non-combined heat and power generation.

The calculation formula is defined in Appendix III of EU Directive 2012/27/EU on the promotion of cogeneration based on a useful heat demand.

Every small and mini CHP system (<1 MW) that delivers a primary energy saving is considered highly efficient.

This means that all Vitobloc 200 CHP units used for cogeneration are highly efficient.

1.4 Mains substitution mode

Subject to the design of the on-site low voltage main distribution system (NSHV) as well as additional on-site equipment and appliance-specific changes, CHP units may also be used as replacement power supply systems in mains substitution mode in the event of power failure.

In the case of mains failure with the CHP unit in standby mode, starting and automatic hook-up to the spare busbar of the first CHP unit is possible up to the first load stage within approx. 15 seconds.

The output is reduced by 10% to provide sufficient control reserves in mains substitution mode. Hook up the consumers which are entitled to receive emergency power in stages (e.g. 30% – 30% – 30% with respect to the current).

The heating water return temperature must not exceed 60 °C in mains substitution mode. The mains substitution function does not apply in conjunction with the operation of an absorption cooling system.

1.5 Emissions

For emission values after emission control, refer to Chap. 4 “Specification”.

Power index

The CHP unit is a series product without a heat transfer device in accordance with the Gas Appliances Directive.

The power index is defined according to Code of Practice AGFW FW308 as the quotient of electrical output divided by the heating output. The value, according to Chapter 4 “Specification”, lies in the defined range between 0.5 and 0.9 for CHP systems with combustion engines.

Primary energy factor

The primary energy factor (with the abbreviation “fp”) represents the relationship between the primary energy consumed and the final energy generated, with not only the energy conversion influencing this factor, but also the transport. In other words, this means that the lower the primary energy factor, the more favourable the impact when determining the annual primary energy demand. The more environmentally responsible the energy employed and its conversion, the lower the primary energy factor.
1.6 Energy statement

The energy statement graphically illustrates the energy flow of the CHP unit. The energy statement illustrates the conversion of primary energy (natural gas or LPG, 100 %) into useful electrical and thermal energy. Losses incurred during this conversion are also illustrated. The maximum internal electrical consumption is not illustrated; this may vary depending on the operating state.

The useable electrical energy is created by the combustion process within the gas engine, the rotational movement of which is converted into electricity via a synchronous generator.

The useable thermal energy is also created by the combustion process within the gas engine. It is divided between the exhaust gas heat, the header, the engine block and the engine lubricating oil and is used for heating purposes, e.g. for heating water.

The overall efficiency of the CHP unit is calculated by adding the useable electrical and thermal energy. The efficiency according to [German] Energy Tax Implementation Ordinance (EnergieStV) is defined as the ratio of the total thermal and mechanical energy generated over the total energy and auxiliary energy consumed.

![Energy statement diagram]

**EM-20/39**

- Natural gas: 32.2 %
- LPG: 31.1 %
- Total: 62.7 %

**EM-20/39 RL70**

- Natural gas: 32.2 %
- LPG: 31.1 %
- Total: 57.6 %

Fig. 2 Energy statement for the CHP unit in the case of optimum thermal connection
2 Product description

The CHP unit comprises various assemblies and components, which are explained in this chapter. The assemblies and components are part of the standard delivery of the CHP unit.

2.1 Gas engine with accessories

2.1.1 Gas engine

The gas engine is based on an industrial gas engine manufactured by Toyota. This gas engine is operated as an internal combustion engine (naturally aspirated engine) without a turbocharger and with an air ratio of Lambda = 1. The piston heads are cooled by a pressurised oil jet. The exhaust gases are discharged via a water-cooled exhaust gas header.

2.1.2 Engine lubricating oil system

The engine is lubricated by a forced-feed lubrication system. Crankcase ventilation is connected to the combustion air intake via an oil separator.

2.1.3 Engine cooling system

The engine is cooled by means of a sealed, internal water circuit driven by a pump. Due to the optimised hydraulic design of the internal cooling circuit, no heating water return temperature raising facility is required.

2.1.4 Battery starter system

Two maintenance-free batteries supply the engine starter and the ignition system with the electrical power for the engine starting procedure. The batteries also supply the electrical power for the monitoring and regulating devices.

2.1.5 Combustion air filter

The combustion air supplied to the gas engine is filtered by the combustion air filter.

2.2 Unit components

2.2.1 Gas supply and gas-air mixer

Gas is supplied to the CHP unit via an internal gas supply unit, with the following components approved according to DVGW:
- Gas filter (part of the standard delivery)
- Flexible stainless steel hose pipe (part of the standard delivery)
- Ball valve with thermally activated shut off equipment
- Gas pressure switch for minimum pressure
- Two solenoid valves designed as gas safety valves (normally closed)
- Zero governor for adjusting to zero pressure downstream of the gas train
- Linear actuator for fuel gas admixing
- Gas-air mixer, permanently set, with throttle

The gas flow pressure at the CHP/gas train transfer point must at least be 20 mbar and no more than 50 mbar.
2.2.2 Clutch

The clutch connects the gas engine to the synchronous three-phase generator.

2.2.3 Synchronous three-phase generator

Rotational movement by the synchronous three-phase generator generates electrical power.

The synchronous three-phase generator is equipped with an automatic cos-φ control unit.

2.2.4 Base frame

The base frame supports the CHP unit (gas engine, synchronous three-phase generator, coolant pump, coolant expansion vessel, heat exchanger, exhaust gas cleaning system, lubricating oil supply system and noise attenuating elements). Detachable supports facilitate the lifting of larger components using lifting gear, cranes or similar for inspections.

The hydraulic interfaces for gas, exhaust, condensate, heating water and unit ventilation have been prepared ready to connect on-site on the "connection side". The other three sides are freely accessible for operation and maintenance. Anti-vibration elements for mounting the engine/generator unit are provided on the base frame. The base frame is mounted on four height-adjustable, anti-vibration feet without rigid anchors.

2.2.5 Pipework

The pipework is pre-assembled at the factory and connects the most important elements of the CHP unit (coolant heat exchanger, exhaust gas heat exchanger and engine). Coolant, heating and exhaust pipework between the elements is fully assembled and insulated where necessary.

For the purpose of vibration isolation, all pipe joints are provided with metal expansion joints or flexible hose connections and are designed as flanged or flat-gasket threaded connections. Pipes conveying water and exhaust gas are made of stainless steel.

2.2.6 Heat transfer system

The plate heat exchanger serves as a defined interface for heat transfer. It releases the heat from the "internal cooling circuit" to the secondary heating water.

2.2.7 Exhaust gas cleaning system

A regulated three-way catalytic converter (reduction of NOx and oxidation of CO and CnHm) reduces emissions of pollutants in the exhaust.

2.2.8 Lubricating oil supply system

Each CHP unit is equipped with a facility to monitor the lubricating oil level. The minimum value can be checked via an electronic level control with alarm contact (oil min.). The oil consumption is covered by an enlarged oil pan and an additional parallel tank, with a volume dimensioned for ≥ one service interval.

For safety reasons, the floor pan can hold the total contents of both engine oil pan and fresh oil reservoir in the event of a fault.

2.2.9 Noise attenuating elements and extract air fan

The casing of the CHP unit consists of noise attenuating elements for the engine/generator unit. Ventilation of the CHP unit is ensured by the extract air fan.

Supply air is drawn in via the floor pan. The average frequency of the sound insulation of the hood is approx. 20 dB.

The CHP unit casing can easily be removed for installation work.

2.2.10 Materials provided as standard

The following material is provided with the CHP unit as standard:
- 1 exhaust gas axial expansion joint – nominal diameter DN 50, flange PN 10, installed length 138 mm, with DVGW approval
- 2 corrugated heating hoses – nominal diameter DN 25, nominal length NL 1000, made from steel, 1" female/male thread
- 1 corrugated gas hose, DN 25, length 1000 mm, 1", including double nipple reduction R1" x R½"
- 1 corrugated extract air hose, DN 250, length 1000 mm
- 1 condensate drain expansion joint (silicone hose) with 2 ball joint clamps
- 4 anti-vibration adjustable feet (120 mm diameter)
- gas filter

Delivery as parts provided loose for on-site installation.

The material is inside a box labelled "Material for commissioning EM-20/39".
2.2.11 Monitoring equipment

Monitoring via transmitters for oil pressure, coolant temperature, exhaust gas temperature, heating water temperature and engine speed as well as transmitters for min. coolant pressure, min. lubricating oil level and high limit safety cut-out, including wiring to the control panel.

CHP unit (standard delivery)

On-site services (recommendation)

NOTE

Only use type-tested parts for the safety equipment of the heating circuit connection.
Product description

Overall key:
1 CHP unit (standard delivery)
2 On-site services (recommendation)
10 Flame arrester (biogas)
11 Safety valve (heating water)
12 Heating water pump
13 Return temperature control
14 Heating water return (HR)
15 Heating water flow (HV)
16 Power current 400 V, 50 Hz
17 Coolant mixture flow
18 Coolant mixture return
19 Coolant mixture pump
20 Bypass flow gas separator
21 Safety valve (engine coolant)
22 Oil cooler
23 Coolant pump
24 Diaphragm expansion vessel
25 Coolant heat exchanger
26 Dirt trap
27 Shut-off valve
28 hot water - filling and draining tap
29 bleed valve
30 Exhaust gas heat exchanger
31 Silencer
32 Condensate outlet (KO) on the cleaning cover
33 Exhaust gas outlet (AGA)
34 Exhaust gas outlet (AGA)
35 3-way catalytic converter
36 Neutralization

41 Lambda control valve
42 Solenoid valve
43 Zero governor
44 Gas connection (GAS)
45 Gas filter, provided loose
46 Gas ball valve with thermally activated safety valve
47 Leak detector
48 Gas meter
51 Auxiliary lubricating oil tank (fresh oil)
52 Parallel tank with min. oil level monitoring
53 Lubricating oil return (from oil separator)
54 Crankcase vent
55 Oil separator
56 Combustion air
57 Air filter
58 Gas-air mixer
59 Engine
60 Speed governor and throttle
61 Crankcase vent
62 Crankcase vent
63 Oil separator
64 Combustion air
65 Air filter
66 Gas-air mixer
67 Generator
68 Exhaust gas header
69 Engine
70 Speed governor and throttle
71 Turbocharger
72 Mixture intercooler (stage 1)
73 Mixture intercooler (stage 2)
74 Safety valve (low temperature circuit)
75 Lubricating oil return (from oil separator)
76 Crankcase vent
77 Oil separator
78 Combustion air
79 Air filter
80 Gas-air mixer
81 Engine
82 Speed governor and throttle
83 Silencer hood

Test points:
EIA Generator monitoring indicator
ES Generator output control
LS Fill level control
LZA Minimum level control
P Pressure
Pn Gas flow pressure
PC Pressure control
PI Pressure indicator
PO Optical pressure indicator
PZA- Minimum pressure shutdown
PZA+ Maximum pressure shutdown
SC Speed controller
STB High limit safety cut-out
STZ- Low speed
T Temperature
TA Extract air temperature before fan
TC Temperature control
TI Temperature indicator
TS Silencer hood temperature
TSA+ Silencer hood overheating shutdown
TZA+ Generator winding temperature monitoring
XC Lambda probe

* Provided loose for on-site installation
** Optional equipment

NOTE
Only use type-tested parts for the safety equipment of the heating circuit connection.

Fig. 4 Monitoring equipment Vitobloc 200 EM-20/39 RL70

613251 GB
Product description

2.2.12 Unit control panel with integral GS protection as per VDE-AR-N 4105

The control panel is mounted on the CHP unit as a supporting frame element. All the following components, including wiring, are located inside the CHP unit.

Brief description

Power unit:
- Feed-in circuit breaker, three-pole with thermomagnetic trip, manual actuation

GS protection as per VDE-AR-N 4105:
- Redundant mains protection with “single error safety”
- Mains voltage too high with 10 min averaging
- Mains voltage too high
- Mains voltage too low
- Mains frequency too high
- Mains frequency too low
- Island system detection
- 50.2 Hz control unit with output reduction
- Recording of last fault causes
- Password protection

Generator protection:
- Transformer set
- Generator voltage monitoring
- Generator current monitoring
- Generator load imbalance monitoring
- Generator temperature monitoring
- Fine synchronisation unit

Unit controller BBS 3000:
- Display (4”) and programming unit
- Start-stop sequence controller for mains parallel and optional mains substitution mode
- Output control with warm start, fixed value and modulating modes
- Operating and fault message memory
- Password-protected parameter level
- Data transfer for ignition, Lambda and speed control
- Optional data transfer to on-site BMS (communication module)
- Optional data connection to external cylinder level controller
- Remote monitoring with Telecontrol LAN

Auxiliary drive unit:
- 24 V battery charger with V-I curve
- Emergency stop key switch
- Emergency stop safety contactor combination
- Starter controller
- Coolant pump controller
- Heating water pump controller
- Extract air fan controller
- Buffer discharge pump controller (option)
- Floating signalling contacts for operating and fault messages
Product description

Main wiring diagram of the electrical connection

**Fig. 5** Main wiring diagram of the electrical connection

**Fig. 6** Main wiring diagram of the electrical connection of a CHP unit in mains substitution mode
Service and maintenance

3 Service and maintenance

Consequential operating costs arise for the CHP unit, relating to inspection, servicing and corrective maintenance. Due to its intended use, the CHP unit is exposed to various influences, such as wear, ageing, corrosion, and thermal and mechanical loads. This is described by DIN 31051 as wear. Components of the CHP unit are designed with a wear margin that ensures reliable operation of the CHP system in accordance with the operating conditions up to impairment of the functional capability. Once this point has been reached, these parts – differentiated into wearing parts and parts with a finite service life – must be replaced.

PLEASE NOTE:
Carry out a service at least once a year and no later than after 6000 hours run.

PLEASE NOTE:
Proper servicing of the CHP unit may only be carried out by authorised personnel. Use only original spare parts and operating fluids (lubricating oil) approved by the CHP unit manufacturer. The operator is responsible for safeguarding and observing the regulations regarding operating fluids.

NOTE
The expected service life of the CHP unit is at least 10 years, provided that regular service and maintenance work is carried out.
Specification

4 Specification

All the following design and operating data relates to one CHP unit. You will find detailed instructions for planning and implementation in the Expert Natural Gas Series for Combined Heat and Power Plants (Planning Instruction for Vitobloc 200).

4.1 CHP unit operating parameters

4.1.1 Performances and efficiencies

<table>
<thead>
<tr>
<th>Performances and efficiencies of CHP unit</th>
<th>EM-20/39</th>
<th>EM-20/39 RL70</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural gas</td>
<td>LPG</td>
</tr>
<tr>
<td>Continuous output 1) in mains parallel mode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical output 2) cannot be overloaded</td>
<td>100% load kW</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>75% load kW</td>
<td>15.0</td>
</tr>
<tr>
<td></td>
<td>50% load kW</td>
<td>10.0</td>
</tr>
<tr>
<td>Heating output Tolerance 7%</td>
<td>100% load kW</td>
<td>39.0</td>
</tr>
<tr>
<td></td>
<td>75% load kW</td>
<td>27.5</td>
</tr>
<tr>
<td></td>
<td>50% load kW</td>
<td>22.3</td>
</tr>
<tr>
<td>Fuel use Tolerance 5% (at Hi [net cv])</td>
<td>100% load kW</td>
<td>62.0</td>
</tr>
<tr>
<td></td>
<td>75% load kW</td>
<td>51.5</td>
</tr>
<tr>
<td></td>
<td>50% load kW</td>
<td>40.6</td>
</tr>
<tr>
<td>Power index according to AGFW FW308 (electrical output / thermal output)</td>
<td>0.505</td>
<td>0.499</td>
</tr>
<tr>
<td>Primary energy factor IPE as per DIN V 18599-9 3)</td>
<td>0.340</td>
<td>0.397</td>
</tr>
<tr>
<td>Primary energy savings PEE in accordance with directive 2012/27/EU (High Efficiency Certificate)</td>
<td>28.05</td>
<td>25.74</td>
</tr>
<tr>
<td>Efficiency as per EnergieStV 4)</td>
<td>% 96.3</td>
<td>93.5</td>
</tr>
</tbody>
</table>

Efficiency in mains parallel mode 1)

| Electrical efficiency | 100% load | % 32.2 | 31.1 | 32.2 | 31.1 |
|                        | 75% load | % 29.1 | 29.0 | 29.1 | 29.0 |
|                        | 50% load | % 24.6 | 25.7 | 24.6 | 25.7 |
| Heat efficiency        | 100% load | % 62.7 | 61.3 | 57.6 | 56.2 |
|                        | 75% load | % 53.4 | 61.1 | 59.4 | 67.1 |
|                        | 50% load | % 54.9 | 69.9 | 56.9 | 71.9 |
| Overall efficiency     | 100% load | % 95.2 | 92.4 | 89.8 | 87.3 |
|                        | 75% load | % 82.5 | 90.1 | 88.5 | 96.1 |
|                        | 50% load | % 79.5 | 95.6 | 81.5 | 97.6 |

1) Output ratings in accordance with ISO 3046 part 1 (at air pressure 1000 mbar, air temperature 25 °C, relative humidity 30 %, 30 °C heating water inlet temperature in the unit and cos φ =1).

2) All further unit data applies to full load in mains parallel mode; partial load data is non-binding and for information purposes only; data for other installation conditions upon request.

3) Calculated in accordance with DIN V 18599-9 with a primary energy factor for natural gas/LPG of 1.1 and for electricity of 2.8 (EnEV 2014).

4) The efficiency according to [German] Energy Tax Implementation Ordinance (EnergieStV) is defined as the ratio of the total thermal and mechanical energy generated over the total energy and auxiliary energy consumed.

Tab. 2 CHP unit operating parameters - Performances and efficiencies
Specification

4.1.2 Operating parameters - energy

<table>
<thead>
<tr>
<th>Operating parameters - energy</th>
<th>Vitobloc 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat generation (heating)</td>
<td></td>
</tr>
<tr>
<td>return temperature upstream of unit</td>
<td>min. / optimal / max. °C</td>
</tr>
<tr>
<td>standard temperature difference</td>
<td>return/forward flow K</td>
</tr>
<tr>
<td>flow temperature</td>
<td>max. °C</td>
</tr>
<tr>
<td>heating water volume flow</td>
<td>standard m³/h</td>
</tr>
<tr>
<td>maximum acceptable operating pressure</td>
<td>bar</td>
</tr>
<tr>
<td>pressure loss at standard flow rate in the unit</td>
<td>standard mbar</td>
</tr>
</tbody>
</table>

**Electrical energy**

| Voltage | 400 |
| Current rated current In at cos φ = 1 | A | 29 |
| Frequency | Hz | 50 |
| Electrical output at | cos phi = 1 and Un kW | 20 |
| cos phi = 0.95 and Un kW | 20 |
| cos phi = 0.9 and Un kW | 20 |
| cos phi = 0.95 and Un -10% kW | 20 |
| cos phi = 0.9 and Un -10% kW | 20 |
| Own power consumption 2) rated / max. kW | 0.3 / 0.75 |

1) In mains substitution systems, return temperature max. 60 °C
2) Demand for coolant pump, fan, battery charger, power consumption is subject to the ambient temperature and the battery state of charge

Tab. 3 Operating parameters - energy

4.1.3 Operating fluids and capacities

<table>
<thead>
<tr>
<th>Operating parameters - operating fluids and capacities</th>
<th>Vitobloc 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat generation (heating) valid for all variants</td>
<td></td>
</tr>
<tr>
<td>Properties of fuel, lubricating oil, coolant and heating water</td>
<td>See latest operating regulations</td>
</tr>
<tr>
<td>Capacity</td>
<td>Motor oil pan l</td>
</tr>
<tr>
<td></td>
<td>Parallel lubricating oil tank l</td>
</tr>
<tr>
<td></td>
<td>Refilling tank l</td>
</tr>
<tr>
<td></td>
<td>Coolant l</td>
</tr>
<tr>
<td></td>
<td>Heating water l</td>
</tr>
<tr>
<td>Gas flow pressure 1)</td>
<td>mbar</td>
</tr>
</tbody>
</table>

1) Gas connecting pressure is in accordance with DVGW-TRGI 1986/96 of the gas flowing pressure at the beginning of the module’s gas regulating route

Tab. 4 Operating parameters - operating fluids and capacities
4.1.4 Emissions

Operating parameters - Emissions of CHP unit

<table>
<thead>
<tr>
<th>Pollutant emissions at 100% load ¹</th>
<th>Vitobloc 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>valid for all variants</td>
<td>EM-20/39</td>
</tr>
<tr>
<td></td>
<td>EM-20/39 RL70</td>
</tr>
<tr>
<td>NOx content (measured as NO2)</td>
<td>mg/Nm³</td>
</tr>
<tr>
<td>CO content</td>
<td>mg/Nm³</td>
</tr>
<tr>
<td>Formaldehyde CH₂O</td>
<td>mg/Nm³</td>
</tr>
</tbody>
</table>

Sound emission
Sound pressure level at 1 m distance in the open according to DIN 45635 (tolerance to the specified values 3 dB(A))

<table>
<thead>
<tr>
<th>exhaust gas ²</th>
<th>dB(A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>module</td>
<td>52</td>
</tr>
</tbody>
</table>

¹ Emission values as per the catalyst based on dry exhaust gas
² We urgently recommend providing 2 consecutive exhaust gas sound absorbers when using the block-type thermal power station in residential areas to comply with the demands of spaces requiring special protection.

Tab. 5 Operating parameters - Emissions of CHP unit

4.1.5 Ventilation and exhaust gas

<table>
<thead>
<tr>
<th>Ventilation and exhaust gas</th>
<th>Vitobloc 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>valid for all variants</td>
<td>EM-20/39</td>
</tr>
<tr>
<td></td>
<td>EM-20/39 RL70</td>
</tr>
<tr>
<td>module’s radiating heat</td>
<td>kW</td>
</tr>
<tr>
<td>without connecting line</td>
<td>2</td>
</tr>
<tr>
<td>installation room ventilation</td>
<td>m³/h</td>
</tr>
<tr>
<td>nominal supply air volume flow</td>
<td>1,600</td>
</tr>
<tr>
<td>nominal extract air volume flow</td>
<td>1,540</td>
</tr>
<tr>
<td>residual pressure</td>
<td>Pa</td>
</tr>
<tr>
<td>at nominal extract air volume flow</td>
<td>100</td>
</tr>
<tr>
<td>supply air temperature</td>
<td>°C</td>
</tr>
<tr>
<td>min./max.</td>
<td>10 / 35</td>
</tr>
</tbody>
</table>

Exhaust gas

<table>
<thead>
<tr>
<th>Exhaust gas mass flow rate, dry 0 % O₂ (0 °C; 1012 mbar)</th>
<th>kg/h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>82</td>
</tr>
<tr>
<td>Max. permissible back pressure Downstream of unit</td>
<td>mbar</td>
</tr>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>mbar</td>
</tr>
<tr>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Exhaust gas temperature max.</td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

¹ Ambient temperature no higher than 35°C and its average value over a period of 24 hours no higher than 30°C

Tab. 6 General operating parameters - Ventilation and exhaust gas

4.1.6 Determining the energy efficiency class (ErP label)

<table>
<thead>
<tr>
<th>Technical data for determining the energy efficiency class (ErP label) 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variants</td>
</tr>
<tr>
<td>Natural gas</td>
</tr>
<tr>
<td>Energy efficiency class</td>
</tr>
<tr>
<td>Electrical efficiency rₜₐₜ,CHP100+Sup0 %</td>
</tr>
<tr>
<td>Thermal efficiency rₜₐₜ,CHP100+Sup0 %</td>
</tr>
<tr>
<td>Minimum electrical consumption eMN</td>
</tr>
<tr>
<td>Maximum electrical consumption eMAX</td>
</tr>
<tr>
<td>Stand-by electricity consumption P₀stb</td>
</tr>
<tr>
<td>Thermal performance Pₜₜₜ,CHP100+Sup0 kW</td>
</tr>
<tr>
<td>Thermal stand-by losses P₀stb</td>
</tr>
<tr>
<td>Power required for ignition spark P₀ign</td>
</tr>
</tbody>
</table>

¹ The data required for the energy efficiency calculation for a package composed of different heat generators according to the basis for calculation in the Official Journal of the European Union 2014/C 207/02

Tab. 7 Determining the energy efficiency class (ErP label)
## Specification

### 4.2 Specification of a complete CHP unit in natural gas or LPG operation

<table>
<thead>
<tr>
<th>CHP unit specification</th>
<th>Vitobloc 200 EM-20/39</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine with accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Gas engine</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Engine type</td>
<td>4Y</td>
</tr>
<tr>
<td>Operation</td>
<td>4-stroke</td>
</tr>
<tr>
<td>Number/arrangement of cylinders</td>
<td>4/in line</td>
</tr>
<tr>
<td>Bore/stroke</td>
<td>mm</td>
</tr>
<tr>
<td>Cubic capacity</td>
<td>cm³</td>
</tr>
<tr>
<td>Speed</td>
<td>rpm</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>10.5:1</td>
</tr>
<tr>
<td>Standard output¹)</td>
<td>Cannot be overloaded</td>
</tr>
<tr>
<td>Gas consumption, natural gas at Hi [net cv] = 10.0 kWh/m³</td>
<td>Nm³/h</td>
</tr>
<tr>
<td>Gas consumption, LPG at Hi [net cv] = 12.87 kWh/kg</td>
<td>kg/h</td>
</tr>
<tr>
<td>Total lubricating oil capacity</td>
<td>l</td>
</tr>
<tr>
<td>Lubricating oil consumption (average)</td>
<td>g/h</td>
</tr>
<tr>
<td>Engine weight, dry (approx.)</td>
<td>kg</td>
</tr>
<tr>
<td><strong>Plate heat exchanger</strong></td>
<td></td>
</tr>
<tr>
<td>Heating output at inlet/outlet 40/60 °C</td>
<td>kW</td>
</tr>
<tr>
<td>Max. heating water temperature Inlet/outlet</td>
<td>°C</td>
</tr>
<tr>
<td><strong>Synchronous generator</strong></td>
<td></td>
</tr>
<tr>
<td>Generator type</td>
<td>LSA 42.3 VS2</td>
</tr>
<tr>
<td>Apparent power $S_n$ at cos phi = 0.8</td>
<td>kVA</td>
</tr>
<tr>
<td>Three-phase current Voltage / frequency</td>
<td>V / Hz</td>
</tr>
<tr>
<td>Speed</td>
<td>rpm</td>
</tr>
<tr>
<td>Efficiency at rated output of the unit and cos $\phi = 1^{(2)}$</td>
<td>%</td>
</tr>
<tr>
<td>Rated current</td>
<td>A</td>
</tr>
<tr>
<td>Sub-transient short circuit current $I''_k$ - initial - short alternating current according to DIN EN 60909-0 (VDE 0102)</td>
<td>A</td>
</tr>
<tr>
<td>Max. permissible load connection</td>
<td>A</td>
</tr>
<tr>
<td>Stator connection</td>
<td>Star</td>
</tr>
<tr>
<td>IP rating</td>
<td>IP 23</td>
</tr>
</tbody>
</table>
## Specification

### Cables to CHP terminal box (recommendation)

<table>
<thead>
<tr>
<th>Description</th>
<th>X1:</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse rating NSHV (recommendation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum required version for proper connection of CHP system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply to NSHV, grid coupling section or transformer station</td>
<td>X1: L1, L2, L3, N, PE</td>
<td>H07 RNF 5 x 10 mm²</td>
</tr>
<tr>
<td>On-site remote selection &quot;Heating mode&quot; 100 % output</td>
<td>X1: Terminal 31 / 32</td>
<td></td>
</tr>
<tr>
<td>Unit feedback (floating contact) &quot;Ready&quot;</td>
<td>Terminal relay - direct connection -2SK5 connections 11/14</td>
<td>Ölflex 4 x 1.5 mm²</td>
</tr>
<tr>
<td>Unit feedback (floating contact) &quot;Mains parallel mode&quot;</td>
<td>Terminal relay - direct connection -2SK6 connections 11/14</td>
<td></td>
</tr>
<tr>
<td>Unit feedback (floating contact) &quot;Fault&quot;</td>
<td>Terminal relay - direct connection -2SK10 connections 11/14</td>
<td></td>
</tr>
<tr>
<td>Heating water pump 230 V / 2 A</td>
<td>X5: Terminal 1 / N / PE</td>
<td>Ölflex 3 x 1.5 mm²</td>
</tr>
<tr>
<td>Buffer cylinder discharge pump 230 V / 2 A</td>
<td>X5: Terminal 2 / N / PE</td>
<td>Ölflex 3 x 1.5 mm²</td>
</tr>
<tr>
<td>Heating water control valve (return temperature raising) 0..10 V</td>
<td>X5: Terminal 3 / 4 / 5 / 6</td>
<td>Ölflex 4 x 0.75 mm²</td>
</tr>
<tr>
<td>Exhaust gas high limit safety cut-out (STB)</td>
<td>X1: Terminal 39 / 40</td>
<td>Connecting cable STB</td>
</tr>
<tr>
<td>Earth cable from unit to on-site equipotential busbar</td>
<td>Sizing according to on-site conditions</td>
<td></td>
</tr>
<tr>
<td>Extended system version with &quot;Mains substitution mode&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measured mains voltage upstream of grid coupling switch</td>
<td>X1: Terminal 7 / 8 / 9 / N / PE</td>
<td>Ölflex 5 x 1.5 mm²</td>
</tr>
<tr>
<td>Grid coupling switch feedback is on (Feedback from the NSHV or grid coupling section)</td>
<td>X1: Terminal 12 / 13</td>
<td>Ölflex 5 x 1.5 mm²</td>
</tr>
<tr>
<td>Grid coupling switch feedback is off (Feedback from the NSHV or grid coupling section)</td>
<td>X1: Terminal 14 / 15</td>
<td></td>
</tr>
<tr>
<td>Selection of mains substitution mode 4)</td>
<td>X1: Terminal 33 / 34</td>
<td>Ölflex 3 x 1.5 mm²</td>
</tr>
<tr>
<td>Grid coupling switch activation &quot;Enable grid coupling switch&quot; (floating contact)</td>
<td>X5: Terminal 7 / 8</td>
<td>Ölflex 3 x 1.5 mm²</td>
</tr>
</tbody>
</table>

1) Output ratings according to ISO 3046 part 1
   (at air pressure 1000 mbar, air temperature 25 °C, relative humidity 30 % and cos φ = 1)
   All further unit data applies to mains parallel mode; data for other installation conditions upon request
2) cos φ display value in generator reference arrow system
3) The 230 V version of the heating water pump can be connected directly. With a 400 V pump the power unit must be installed on-site. The control selection, however, travels at zero volts from the unit controller.
4) The selection for mains substitution mode is made by the external control system after on-site load shedding has been completed. The selection can be automatically processed inside the unit, but without load control monitoring.

Tab. 8 Complete CHP unit specification

### NOTE

This cable list contains the required minimum version for proper connection of a CHP system and serves merely as a guide. The relevant specialist electrical installation contractor is responsible for correct wiring of the system, which must be carried out in accordance with the local conditions and all current VDE and power supply utility regulations.
4.3 Dimensions, weights and colours

<table>
<thead>
<tr>
<th>CHP unit dimensions</th>
<th>Frame size</th>
<th>incl. silencer hoods, gas train and feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length mm</td>
<td>1,956</td>
<td>2,242</td>
</tr>
<tr>
<td>Width mm</td>
<td>840</td>
<td>900</td>
</tr>
<tr>
<td>Height mm</td>
<td>1,337</td>
<td>1,432</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHP unit weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry weight (approx.) kg</td>
</tr>
<tr>
<td>Operating weight (approx.) kg</td>
</tr>
</tbody>
</table>

**Colours**

- Engine, generator: Light grey (RAL 7035)
- Frame: Anthracite grey (RAL 7016)
- Control panel: Vitosilver
- Silencer hood: Vitosilver

**Connections**

<table>
<thead>
<tr>
<th>AGA</th>
<th>Exhaust outlet</th>
<th>Mounting flange</th>
<th>DIN 2566</th>
<th>DN 50 PN 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>KO</td>
<td>Condensate drain</td>
<td>Pipe</td>
<td>DIN EN 10220</td>
<td>R ½&quot; external thread</td>
</tr>
<tr>
<td>GAS</td>
<td>Gas inlet</td>
<td>Gas ball valve</td>
<td>DIN EN 10226</td>
<td>Rp ½&quot; 11 internal thread</td>
</tr>
<tr>
<td>HV/HR</td>
<td>Heating flow/return</td>
<td>Pipe connector</td>
<td>DIN EN 10226</td>
<td>R 1&quot; external thread</td>
</tr>
<tr>
<td>AL</td>
<td>Extract air outlet</td>
<td>Plain flange</td>
<td>—</td>
<td>DN 250</td>
</tr>
</tbody>
</table>

**Electrical connections and earthing**

- Sizing as per local conditions and current VDE and power supply utility regulations (see Tab. 5 for a recommendation)

1) Standard connection accessories: Gas hose 1", incl. double nipple reduction R1" x R1/2" as pressure buffer to balance gas pressure fluctuations

**Tab. 9 Dimensions, weights, colours and connections**

**Fig. 7 Dimensions and connections for Vitobloc 200 EM-20/39 CHP unit (dimensions in mm)**
4.4 Siting information

You will find detailed instructions for planning and implementation in the Expert Natural Gas Series for Combined Heat and Power Plants (Planning Instruction for Vitobloc 200) and the corresponding "Installation instructions".

Observe the following points when siting the CHP unit:

- The room where it will be erected should be made pursuant to the applicable firing directive and applicable construction law ordinances/ regulations. We recommend integrating the CHP module into the fire protection strategy for safe operation.
- To increase workplace safety for the operator we recommend that you install a CO monitor in the installation room.
- For operating and maintenance purposes, maintain a clearance as shown in installation diagram Fig. 8.
- For maintenance works, a filling and draining tap must be installed by the customer in close proximity to the CHP in the hot water inflow (e.g. a ½" KFE tap) and a vent valve must be installed in the hot water return (Fig. 3).
- We recommend that the gas supply pipe is designed with double the diameter approx. 5 m upstream of the CHP system in order to use this section as a buffer. This allows pressure fluctuations to be absorbed when boilers are switched on and off.
- We recommend using a calibrated gas meter, size G6, for natural gas operation. The gas meter should be provided on site.
- There is an option of equipping the BHKW module with a calibrated power meter with M-Bus-connection. The meter must also be ordered as an accessory.
- Condensate forms during operation of the CHP unit. A hydraulic seal (siphon flue) with an effective water column height of at least 250 mm WC must be provided in order to prevent the exhaust gas from escaping through the condensate drain pipe. Check the fill level of the hydraulic seal before every start.
- A reinforced installation base measuring 1200 x 1000 x 150 mm (LxWxH), on which the CHP unit is positioned unrestricted on flexible elements, helps to increase the mass for improved insulation of structure-borne noise from the building structure. This is particularly important in residential buildings. Fully supporting the base on Sylomer mats is a practical solution for structure-borne noise attenuation.
- When using an exhaust gas manifold in multi-unit systems, the back flow of exhaust into idle CHP units must be reliably prevented by one 100 % gas-tight motorised shut-off damper per unit. Otherwise, provide a separate exhaust pipe for each CHP unit.

Dispose of the exhaust condensate in accordance with local regulations.

Since oil vapour in the exhaust gas can condense at low exhaust temperatures, provide an oil separator in the condensate line on site.

**Fig. 8** Sample installation designs – depiction without fittings and safety assembly (dimensions in mm)

**Tab. 10** Installation dimensions
4.5 Start-stop ratio

The module should be at least 180 min in operation per start (approximately 3:1 ratio of the number of operating hours to the starts). Early wear and tear in the starting equipment from shorter times are caused by operation and are not a defect.
General design and operating information

5 General design and operating information

Observing the following points improves the operational reliability.

Faults and consequential losses resulting from prohibited operating conditions are not covered by the warranty or any service contract.

Sizing
- Avoid cyclical on-off operation and provide a buffer if necessary:
  \[ V_{\text{buffer}} = Q_{\text{h}} \times 43 \text{ l/kW}_h \]  
  (minimum buffer size)

Installation room
- Install exhaust and extract air silencers in buildings where noise levels are critical; always factor in flexible connections (expansion joints).
- Ensure correct sizing and routing of the extract air and exhaust pipes (pressure drops, nominal diameters, flow noise).
- Use anti-vibration elements during installation to prevent structure-borne noise.

DANGER!
Do not assemble together with a boiler plant atmospheric burner or a NH3 refrigeration machine in a room/air ratio.

Heating
- Ensure a constant, adequate heating water flow rate.
- The combined heat and power (CHP) unit must be protected against silting from the existing heating system. It is recommended that you install a dirt catcher and a dirt separator in the return line to the CHP unit.
- Prevent fault shutdowns due to excessive heating water return temperatures. The heating water return temperature must not exceed the permissible value in either mains substitution mode or mains parallel mode.
- For hot water return temperatures lower than the minimum value as per the Technical specifications (Sec. 4.1.2), an increase in the return temperature is planned, which must be installed as close as possible to the CHP unit.
- The mains substitution function does not apply in conjunction with operation of an absorption cooling system.

Exhaust gas
- Size the exhaust cross-section adequately.
- In the case of prefabricated systems, the exhaust system must be type-approved, pressure-tight and pulsation-proof up to 50 mbar. At this test pressure, leakage must not exceed 0.006 l/m²s (corresponds to H1).
- For the condensate, provide an unrestricted drain with a fall of at least 3 %, which must be installed above the siphon (U-bend) at a height of min. 250 mm to prevent exhaust gas escaping through the condensate drain.
- Hydraulic seals must be executed, so that the water level can be checked and filled. The condensate line must be checked regularly for blockages and sufficient water seal.
- Observe the exhaust system installation instructions for the Vitobloc 200.

Ventilation
- Ensure non-preheated and dust, sulphur & halogen-free cooling and combustion air.
- Ensure an adequate supply of fresh air and that extract air is discharged securely.
- In the case of air containing chlorine (e.g. in swimming pools), provide a separate supply air intake.

Fuel
- Ensure gas flow pressure of 20 mbar to 50 mbar.
- Recommendation: Oversize the gas supply pipe to create a pressure buffer with double the diameter approx. 5 m upstream of the CHP system.
- For operation with LPG, the "Technical rules for LPG 2012 - DVGW TRF 2012" must be observed.

Electrics
- The CHP unit generates 400 V of power. For safety reasons, it has sensitive electrical mains protection systems, which react to asynchronous network loads in the customer network according to the regulations. Safety shutdowns do not constitute a CHP unit fault.
- Incorrect sizing of the electrical loads in mains substitution mode can lead to fault shutdowns due to overload (inductive or capacitive start-up currents carry up to 20 times the rated current and lead to overloading of the CHP unit).
- Always avoid shutting down on full load, as this would subject the components to the highest mechanical loads.
- CHP units must be connected to the on-site equipotential busbar via an earth cable (for earth connection, see the installation instructions).

Service + operating fluids
- Regular servicing and maintenance by qualified personnel. We recommend a service contract.
- Elimination of drip leaks, proper disposal of old oil, regular checking of exhaust condensate lines for correct function.
- During longer idle periods, disconnect the batteries when decommissioning the unit and, in the case of shutdowns lasting longer than 12 weeks, perform a warranty preservation.
- Perform the warranty preservation no later than 24 weeks after delivery.
6 Declaration of conformity

EU-Konformitätserklärung

Vitobloc 200

Blockheizkraftwerk (BHKW) mit Schaltschrank für Erdgas- und Flüssiggasbetrieb

Vitobloc 200 folgende Typen:

EM-6/15
EM-9/20
EM-20/39

Wir, die Viessmann Werke GmbH & Co. KG, D-35107 Allendorf, erklären in alleiniger Verantwortung, dass die bezeichneten Produkte die folgenden Richtlinien und Verordnungen erfüllen:

EU 2016/426 Gasgeräteverordnung
2006/42/EG Maschinenrichtlinie
2014/30/EU EMV-Richtlinie
2014/35/EU Niederspannungsrichtlinie
2010/30/EU Richtlinie zur Energieverbrauchskennzeichnung
811/2013 EU-Verordnung „Energieeffizienzlable“
813/2013 EU-Verordnung „Energieeffizienzanforderungen“

Angewandte Normen:

EN 437:2009-09 VDE 0100 Teil 2:2001
EN 6280-14:1997 VDE 0100 Teil 430:2010
EN 55011:2017 VDE 0100 Teil 460:2015
EN 61000-6-2:2006 VDE 0100 Teil 510:2014
EN 60204-1:2014 VDE 0100 Teil 520:2013
EN 60034-1:2011 VDE 0100 Teil 560:2013
EN 60034-5:2007 VDE 0100 Teil 600:2017
EN 60335-1:2012

Gemäß den Bestimmungen der genannten Richtlinien wird dieses Produkt mit CEE - 0433 gekennzeichnet.

Allendorf, den 16. Mai 2018

Viessmann Werke GmbH & Co. KG

ppa. Reiner Jansen
Leiter Strategisches Qualitätsmanagement
Konformitätsnachweis
Erzeugungseinheit, NA-Schutz

Antragsteller: Viessmann Kraft-Wärme-Kopplung GmbH
Emmy-Noether-Str. 3
86899 Landsberg am Lech
Deutschland

Produkt: BHKW mit integriertem NA-Schutz

Modell: Vitobloc 200 EM-20/39
Leistung: 20kW
Bemessungsspannung: 400V, 50Hz

Die oben bezeichneten Erzeugungseinheiten mit integriertem NA-Schutz erfüllen die Anforderungen der VDE-AR-N 4105.

Der Konformitätsnachweis beinhaltet folgende Angaben:
- technische Daten der Erzeugungseinheit, der eingesetzten Hilfsseinrichtungen und der verwendeten Softwareversion;
- den schematischen Aufbau der Erzeugungseinheit;
- zusammengefasste Angaben zu den Eigenschaften der Erzeugungseinheit.

Netzanschlussregel:
VDE-AR-N 4105:2011-08
Erzeugungsanlagen am Niederspannungsnetz – Technische Mindestanforderungen für Anschluss und Parallelbetrieb von Erzeugungsanlagen am Niederspannungsnetz.

Mitgeltende Normen:
DIN VDE V 0124-100 (VDE V 0124-100):2012-07
Netzintegration von Erzeugungsanlagen – Niederspannung – Prüfanforderungen an Erzeugungseinheiten vorgesehen zum Anschluss und Parallelbetrieb am Niederspannungsnetz.


Berichtsnummer: 13KF0338-04
Zertifikatsnummer: 16-171-00
Ausstelldatum: 2016-11-15

Deutsche Akkreditierungsstelle D/ZE 11089-03-00

Andreas Aufmuth
Zertifizierer
**Getting started**

9  Getting started

**Level 1 - Default screens**

Default screen with "All OK" checkmarks  
Default screens with details  
Customer-specific menu

**Settings**

Panel settings  
Language selection  
List of operating and fault messages  
System info  
Settings K3000  
Service data  
Maintenance schedule  
Operating log

**Level 2 – Operating level**

Hours run  
Motor  
Generator  
Heating  
Buffer cylinder  
User accounts  
Date/time

- Hours run  
- System starts  
- Maintenance interval  
- Time switch

- Current motor operating data  
- Current generator operating data

- Temperatures  
- Flow/return  
- Set value setting  
- Sensor scan

**Level 3 – Setting level (requires password)**

Settings  
Hours run  
Motor  
Generator  
Heating  
Buffer cylinder

Additional setting options only for qualified contractors with password authorisation  
Setting according to operating instructions SFR 3000

Back to previous screen  
Back to default screen with "All OK" checkmarks
### Validity note

**Standard:**
- 7727270  Vitobloc 200 EM-20/39

**Variant:**
- 77272701  Vitobloc 200 EM-20/39 RL70