

**Operational mode** Mains parallel operation  
**Energy efficiency** <sup>1)</sup> **A++**  
**Seasonal heating efficiency** <sup>2)</sup> **287.2 %**

**Fuel** Natural gas

<i>stepless modulation range</i>	- 100 % -	- 50 % -
<b>Electric output</b> (P <sub>el</sub> )	<b>33.0 kW</b>	<b>16.5 kW</b>
<b>Thermal output</b> <sup>8)</sup> (P <sub>th</sub> )		
with calorific value use (RT 30 °C) <sup>9)</sup>	75.1 kW	49.3 kW
with calorific value use (RT 40 °C)	<b>73.4 kW</b>	<b>48.4 kW</b>
without calorific value use (RT 60 °C)	67.0 kW	43.5 kW
<b>Fuel consumption</b> <sup>1)</sup>		
with calorific value use (RT 40 °C)	<b>97.7 kW</b>	<b>58.6 kW</b>
without calorific value use (RT 60 °C)	<b>98.4 kW</b>	<b>58.8 kW</b>
<b>CHPP coefficient</b> <sup>3)</sup>	<b>0.45</b>	<b>0.34</b>

- All of the following information at rated power (100 %) and 40 °C return -

<b>Efficiency</b>	- EN 50465 -	- actual value -
<b>Total efficiency</b>	<b>109.0 %</b>	103.5 %
<b>Electric efficiency</b>	<b>33.8 %</b>	32.1 %
<b>Thermal efficiency</b>	<b>75.2 %</b>	71.4 %

<b>Primary energy savings</b> <sup>4)</sup>	<b>36.5 %</b>	33.2 %
<b>Primary energy factor</b> f <sub>PE,WV</sub> <sup>7)</sup>	<b>0.20</b>	0.28
<b>Total annual use efficiency</b> <sup>4)</sup>	<b>109.0 %</b>	103.5 %

<b>Gas-connection pressure</b>	<b>20-50 mbar</b>
<b>Gas-flow pressure</b>	<b>≥ 16 mbar</b>
<b>Flow rate</b> with natural gas-H	<b>10.3 Nm<sup>3</sup>/h</b> (10.0 kWh/m <sup>3</sup> )

<b>Flow temperature</b>	<b>max. 90 °C</b>
<b>Return temperature</b>	<b>max. 70 °C</b>
<b>Max. System pressure</b>	<b>4 bar</b> (heating side)

<b>Combustion &amp; cooling</b>	<b>min. 125 m<sup>3</sup>/h</b> (135 kg/h)
<b>Ambient temperature</b>	<b>5 °C to max. 35 °C</b>

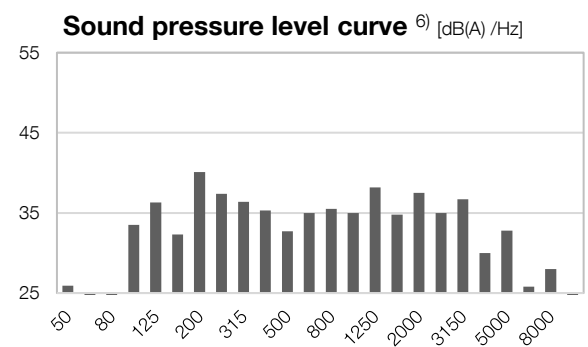
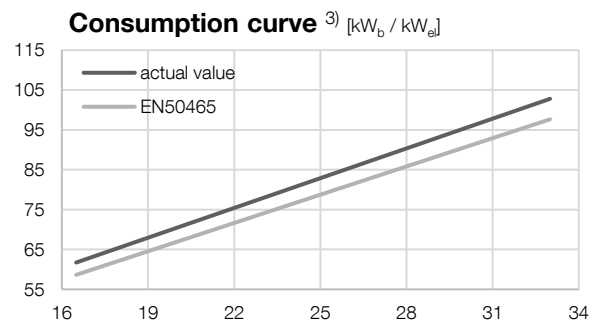
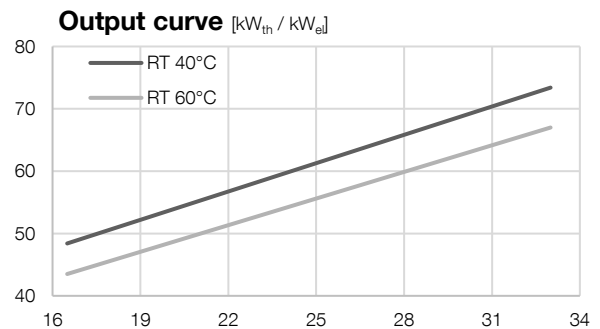
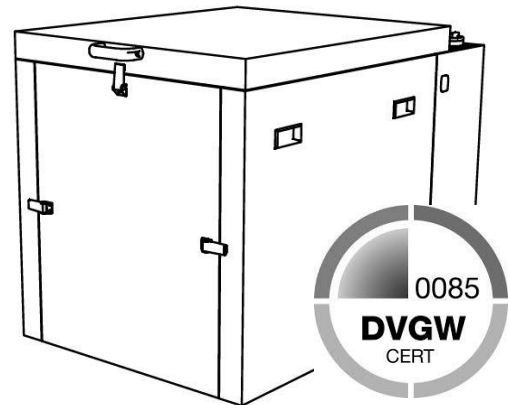
<b>Exhaust gas emissions</b>	at 5 Vol% remaining oxygen
CO (carbon monoxide)	< 100 mg/m <sup>3</sup>
NOx (nitrogen oxide)	< 100 mg/m <sup>3</sup>

<b>Exhaust gas temperature</b> <sup>3)</sup>	<b>~ 50 °C</b>
<b>Exhaust gas volume flow</b>	<b>~ 125 m<sup>3</sup>/h</b>
<b>Exhaust gas mass flow</b> dry	<b>~ 135 kg/h</b>
<b>Exhaust gas back pressure</b> <sup>5)</sup>	<b>max. 5 mbar</b> after CS

**Sound pressure level CHPP** <sup>6)</sup> **48.5 dB(A)** (1 m distance)

**CHPP: Dimensions, weights and connections**

L x W x H CHPP w/o handles	1.59 x 0.91 x 1.105 m
Weight CHPP incl. oil + water	1080 kg
ø x H CS <sup>5)</sup>	0.30 x 1.52 m (w/o flanges)
Weight CS <sup>5)</sup>	30 kg
Colour CHPP	Pantone 5517C
Heating connections (VL)	R 1" Flow (warm) R 1" Return (cold)
Exhaust gas connection CS <sup>5)</sup>	DN100 (Jeremias ew-kl)
Gas connection	R 3/4"



<sup>1)</sup> According to EN 50465, tolerance 5 %

<sup>2)</sup> Seasonal space heating efficiency CHP according to DIN EN 50465:2015, Kap. 7.6.2.2

<sup>3)</sup> Return-temperature 40 °C

<sup>4)</sup> According to EU RL 2004/8/EG with 100 % internal use

<sup>5)</sup> Combination silencer

<sup>6)</sup> According to DIN EN ISO 3744:2011-2

<sup>7)</sup> According to EnEV 2014; f<sub>PE</sub>-current = 2.8

<sup>8)</sup> System as new values

<sup>9)</sup> Calculated values only

<sup>10)</sup> Standard delivery

<b>Engine</b>	<b>K36</b>
Type	Straight engine (Otto)
Operation	4-stroke
Cylinder	4
Displacement	3.6 litres
Nominal engine speed	1500 1/min

**Cabinet: Dimension and weight**  
*(Wall mounting, connections at the bottom, standard cable set 6 m)*

W x D x H	0.40 x 0.19 x 0.52 m
Weight	21 kg
Colour	Pantone 5517C

<b>Asynchronous generator</b>	<b>Emod WKASYG</b>
Cooling	water-cooled
Power	33.0 kW
Rated voltage	400 V
Rated current	56.0 A
Frequency	50 Hz

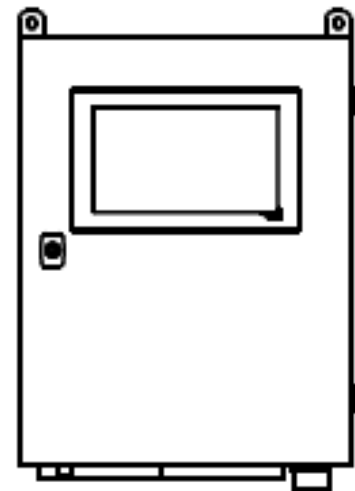
**Electrical data smartblock 33**

max. effective power $P_{Amax}$	33.0 kW	
max. apparent power $S_{Amax}$	34.0 kVA	36.7 kVA
cos $\varphi$	0.97 ind. <sup>10)</sup>	0.90 ind.
Nominal current $I_N$	49.1 A	52.9 A
Nominal voltage $U_N$	400 V AC	
Grid feed	three-phase	
Island operation available	no	
Motor start provided	no	
Starting current $I_A$	0 A	
Short circuit current $I''_k$	0.48 kA	
Short-circuit resistance of the system $l_k$	10 kA	
Reactive power compensation	present	
Number of compensation steps	1	
Reactive power per step	9.3 kvar	4.8 kvar
Choke coil factor	0 %	
Own consumption (Stand-by)	0.060 kW	
Enclosure rating (DIN EN 60529)	IP 20	
Line protection at building site	SLP 63 A „C“- Characteristics	

**Connection to the low voltage grid**  
 Operational mode according to VDE-AR-N 4105  
 "Generation units at the low voltage grid - technical minimum requirements for connection and parallel operation of generation units at the low voltage grid"

**Settings grid protection (VDE-AR-N 4105)**

Voltage drop protection $U_{<}$	0.8 $U_N$ (100 ms)
Voltage increase protection $U_{>}$	1.1 $U_N$ (100 ms)
Voltage increase protection $U_{>>}$	1.15 $U_N$ (100 ms)
Frequency drop protection $f_{<}$	47.5 Hz (100 ms)
Frequency increase protection $f_{>}$	51.5 Hz (100 ms)



**smartblock 33 control BR18**  
 The freely programmable PLC system is equipped with analogue resistive touch screen display for controlling, regulating, counting and visualization, which are required for operating the CHP. The 10.1" display shows information from the CHP and the current status of the system.

The BR18 can optionally be expanded by a heating control system, requirement peak load boiler (up to 2 boilers), data transfer via LAN and Internet with an error notification via email (only with DSL) and an interface connection to external systems (Ethernet UDP, Mod-Bus RTU/TCP, RK512, 3964R).

Additionally, the CHPP can be connected to virtual power plants using VHP-Ready and net.strom.

Standard reference conditions according to EN 50465: The technical data are based on natural gas H with a heating value of 10,0 kWh/Nm<sup>3</sup> (Total air pressure 100 kPa, air temperature 25 °C, relative humidity 30 %, 0m above sea level). The nominal power can be less, depending on the actual height above sea level. The tolerance of the specific fuel consumption is +5 % at nominal power (EN 50465) and the tolerance of the usable thermal output is 7 % at nominal power. We reserve the right to change data and characteristics without prior notice in accordance with our business policy and the ongoing development process. All details refer to systems as new without wear and tear or traces of usage.