BHKW

Clever-BHKW Piko HEL

Fuel	heating oil (HELDIN 51603-1 low-sulphur)
Electrical power	2,2 kW 6 kW
Thermal output	

- Combined heat and power generation
- Smallest cogeneration unit of the clever combined heat and power unit series
- Areas of use: dependent on heat and energy requirement, determined using the profitability calculation (for single-family homes and larger)
- Eligible under the cogeneration subsidy act"
- Reimbursement of mineral oil tax"
- Investment cost benefits (state-dependent)"
- Reimbursement of the electricity fed into the public grid"
- Reimbursement of VAT on purchases and fuel, and

offset facility when registering an industrial activity (power generation)"

[11] Framework conditions for Germany. Conditions differ in other countries.

General data

Operation mode	Mains parallel operation
Overall efficiency	91%
Primery energy factor	0,79
Consumption	0,9 l/h
CHP coefficient	0,37
Voltage	400 V
Current	2,6 - 3,2A
coscos <p	0,98
Sound level	56 dB/A (in 1m distance)
low temperature	max. 85 °C
Return temperature	max. 65 °C

Motor

Type	one cylinder, vertical
Capacity	290 cm^3
Nominal rotation speed	2500 min^{-1}
Working method	4-stroke diesel

Generator

Type	Asynchronous
Cooling	Air cooling

CHP - Modul (dimensions incl. control cabinet)

Length	1220 mm
Width	700 mm
Height	1200 mm
Weight	350 kg
Colour	RAL 6027

Control cabinet

Height	1000 mm
Width	600 mm
Depth	200 mm
Attachment to the CHP	hanging
Cabel entry	from bottom

Connections

Heat flow	R 1/2" AG
Heat return	R 1/2" AG
Flue gas connection	DN 32
Fuel connection	Pipe fitting D6

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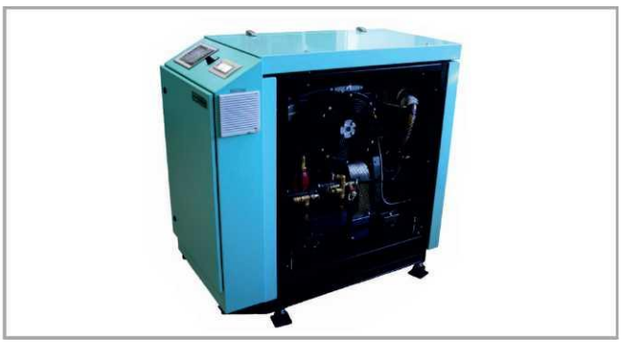

Assembly

Torsion-stiff base frame made of section steel with base tub. Motor and generator are indirectly coupled via an belt pulley and elastically supported on a base frame. Cooling water heat exchanger, exhaust collector, exhaust heat exchanger and motor are completely piped up to the heating and exhaust connection and as appropriate insulated. Exhaust heat exchanger and sound absorber with catalytic converter are attached upright. Control cabinet is mounted hanging at the CHP -module. Installation on an elastical machine base to be able to avoid impact noise transmission.

Display

Engine start

The engine is started via the mains. Fuel

system

Fuel supply with a single chord system via an external electrical fuel pump (pump not included).

Exhaust system

- Insulated exhaust collector
- Low maintenance for tubular heat exchanger with upstream particle filter
- Vibratory decoupling and compensation of the heat expansion via a stainless steel compensator

Aggregate cooling

Dual-circuit cooling circulation system with electrical water pump, pressure compensating tank, pressure control valve and drain valve. Heat transfer from the motor cooling circuit to the heating system via a stainless steel plate heat exchanger. The exhaust heat exchanger is connected to the heating system.

Heating circuit

Constantly high flow temperature via an integrated flow regulation. No external return temperature increase is required.

Sound absorbent cabin

Highly effective sound insulation hood in waffle design made of steel plate, coated, insulation thickness 100 mm, made of 2,0 mm steel plate, heavy layer insulation mat, sheets of mineral wool, trickling protection support and galva-nized perforated metal plate. Both side parts can be opened for maintenance works without tools. Each side part has two handles.

Control

Processor controlled control-, regulation-, supervision and display system. The control has a total graphic-colour-touch-display with all operating functions. The display shows information about the plant and the current status. Functions of the control:

- Start/stop automatic
- Failure indication system, fault indication in plain text
- Starting meter (software)
- Electric meter supply / delivery (software)
- Visualisation of all functions and operating possibilities
- Overview charts and detail charts selectable
- Display of all relevant operating data, failure and alarm messages

Control elements

- Touch - display
- Emergency stop
- Main control switch

- Supervision of CHP
- Maintenance meter (software)
- Heat meter (software)
- Online - supervision via Internet (option)

Standard reference conditions, 20°C air inlet temperature, 400 m above sea level. Performance values are reduced at about 1% per 100 m height and ca. 2% per 5°C above the reference conditions. We receive the right, to change data and charac-teristics without notification

Outlets

- External operating and failure indication (option) Inlets
- External requirement
- Back-up temperature sensor

Motor- und Generatorschutz

- Speed supervision
- Overload supervision
- Oil pressure supervision
- Generator temperature supervision
- Exhaust gas temperature supervision
- Grid/generator protection acc. to VDEW-guidelines
- Voltage supervision
- Reverse power supervision
- Motor temperature supervision
- Cooling water level supervision
- Leak supervision

Connection to the low-voltage mains

- Type according to VDEW guidelines for a customer generation plant (edition 4.2001, picture 5-5, page 44)
- Single customer generation plant in parallel operation with the possibility of single operation
- three-phase feeding

Short-circuit protection Performance control Current supervision	Safety fuses up to 16 A via CHP - control via CHP - control

Mains protection function

Voltage drop protection Voltage rise protection Vector surge supervision Frequency fall-off protection Frequency rise-off protection	365 V 435 V 12° 49,5 Hz 50,5 Hz

Ihr Fachmann für Clever-BHKW: