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Datasheet

A-TRON Helios BG50

Combined Heat and Power Plant for Operation with Biogas

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Helios BG50 for operation with biogas
Performance Data and Components

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Performance Data and Efficiency Ratings:

Gross Electrical Output	13,00 kW bis **50,50 kW***
Net Electrical Output	12,50 kW bis **50,00 kW*** (adjustable)
Thermal Output	58,46 kW bis **110,09 kW***
Gas connection capacity	57,52 kW to **137,85 kW$_{HI}$***
Fuel consumption at full load	19,81 m³/h*
Electrical Efficiency	21,73% to **36,27%***
Thermal Efficiency	101,63% to **79,86%***
Overall Efficiency	123,36% to **116,13%***
Sound pressure level	**≤54 dB(A)** (DIN 45635-11)
CHP coefficient	0,21 to **0,45**
Primary Energy Factor	**-0,239** (DIN/TS 18599-9:2025-10)
Primary Energy Savings	**49,31%** (EU RL 2012/27/EU)
Energy Efficiency Class	A+++

Gas engine:

Type	MAG 49.4 4-Cylinder Industrial Gas Engine, Electronically Controlled, (Electric Start)
Engine displacement	4.91 liters
Rated speed	approx. 1,535 rpm
Compression ratio	15 : 1
Oil Supply	Automatic oil refill and oil change function
Engine Oil Capacity	approx. 10 to 11.5 liters
Fresh Oil Tank Capacity	approx. 20 liters

Gas Connection/Fuel System:

Gas supply pressure	18–100 mbar
Gas flow pressure	≥ 18 mbar
Connection dimension	DN20 connection pipe, 1 m long, with 1" male thread

*All performance and efficiency specifications apply under standard conditions and when operating on natural gas (calorific value Hi = 9.5 kWh/m³). The listed values are based on a return temperature of 35 °C, a relative humidity of 30%, an atmospheric pressure of 1013.25 mbar, and an intake air temperature of 20 °C. All values specified here are subject to a tolerance of ±5%. Deviations are possible under other operating conditions.

Hydraulic heating connection:

Permissible operating pressure	min. 1.5 bar to max. 4.0 bar (optionally up to max. 6.0 bar upon request)
Maximum flow temperature:	90°C (with optional high-temperature setting: max. 95°C)
Connection	DN32 connection pipe, 1 m long, with shut-off valve featuring a 1½" female thread – DN 228-1
Maximum return temperature:	75°C (with optional high-temperature setting: max. 80°C)
Connection	DN32 connection pipe, 1 m long, with shut-off valve featuring a 1½" female thread – DN 228-1
Nominal heating water flow rate	5,15 m³/h
Heating Water Quality	in accordance with VDI 2035 (pH ≥ 8.2 to ≤ 8.9; hardness ≤ 0.1 °dH; electrical conductivity ≤ 100 µS/cm)

Please note: To ensure that the required heating water quality is maintained over the long term, we recommend using or installing a magnetite separator in conjunction with a system separation device.

Exhaust system:

Connection	DN 80 PPs, Type B
Temperature range	max. 120 °C
Exhaust back pressure	max. 10 mbar at the exhaust system's test port
Exhaust air flow rate	max. 238 m³/h
Exhaust emmisions (NOx)	max. 100 mg/Nm³ in accordance with 1/2 TA-Luft
Exhaust emissions (CO)	max. 300 mg/Nm³ in accordance with 1/2 TA-Luft
Operating temperature	max. 95 °C
Catalytic converter	regulated 3-way catalytic converter, water-cooled

Please note: We recommend using a CO and gas detector. This device automatically shuts down the CHP unit in the event of a leak.

Helios BG50 for operation with biogas
Electronics and Standard Features

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Generator:

Designation	Three-Phase Asynchronous Generator
Type	Weier DGA-F-250L4
Pole number	4
Rated power	56,0 kW
Rated voltage	Three-phase AC 3 x 400 V~
Rated current	94,0 A
Power factor cos φ	0,86
Rated frequency	50 Hz
Rated speed	1514 rpm

Compensation:

Compensation power	20 kVA
Frequency	50 Hz
Power Factor	Cos phi = 0,95

Electrical Integration / Connections:

Connections	5 x 25 mm², H07RN-F, length 2 m, with 400 V CEE plug, 125 A
Fuse protection	in accordance with TAB 2019 and VDE-AR-N 4100, NH00 100A
Power connection	3/N/PE 400 V / 50 Hz
Rated voltage	400 V 3-phase
Rated power	50 kW at Cos phi = 0.95
Rated current	max. 76,25 A at 50 kW

Noise emissions:

Sound power (LWA)	≤ 70 dB(A)
Sound pressure level (LAFeq)	≤ 54 dB(A) at a distance of 1 m, in accordance with DIN 45635-11

Shipping dimensions:	1546 mm x 760 mm x 1645 mm (L x W x H)
Installation dimensions:	3946 mm x 1860 mm x 2000 mm (L x W x H), including minimum clearance for maintenance
Shipping weight:	**approx. 1579 kg** (consisting of two packages) 1) Self-supporting CHP unit – 1650 mm x 880 mm x 1730 mm (L x W x H), **approx. 1396 kg** 2) Pallet with covers and accessories – 1650 mm x 1350 mm x 700 mm (L x W x H), **approx. 183 kg**
Control System:	The microprocessor-based control system allows operation via a multilingual graphic display. The CHP unit can be monitored remotely and enables diagnostics via the event log. When connected to the monitoring system, alerts and status updates are automatically forwarded via email, as desired.

Standard features of the ATROMATIC 8.0 control system:

- **Adjustable power curve** (modulation) for individual adaptation to energy demand
- **Adjustable timing** via operating schedule (daily/weekly)
- **Boiler lockout** (for priority operation of the CHP unit)
- **4 binary outputs** for connecting to a control system (SmartGrid or GLT)
- **Heat Load Activation** (Emergency Cooling for Sewage Gas and Biogas Modules)
- **Chimney Sweep Mode** (Maximum power for 10 minutes)
- **Cascade Control** for Efficient Management of Multiple CHP Units
- **Data History** (Operating Hours, Power Consumption, Starts, Logins, Error and Warning Messages, etc.)
- **Control** Based on the Signal from the Remote Control Receiver
- **Calculation based on current CHP incentives** (based on hours of full utilization)
- **Modbus** (status information and sensor information)

Optional features of the ATROMATIC 8.0 control system (available for an additional charge):

- **Balance-of-system** regulations for energy-optimized operation
- **External power modulation**
- **Storage management**
- **Interface for gas and heat meters**
- **CO and gas monitors with emergency shutdown**
- **System monitoring (Control Center)**
- **Email notifications** (malfunctions, warnings, energy data, etc.)

Standard Equipment / Scope of Delivery for the Combined Heat and Power Unit:

- **Electricity meter** (calibrated)
- **Reactive power compensation** (protects the power grid)
- **Integrated condensing heat exchanger** (stainless steel)
- **Starter-driven start-up with wide-range lambda control**
- **Automatic oil change function**
- **Initial fill with coolant and lubricants**
- **Vibration isolation** (engine and generator)
- **Exhaust backpressure monitor** (monitors exhaust backpressure)
- **Heating water pump** (for the heating circuit)
- **Floor isolation mat** (for vibration and sound isolation)
- **Internal condensate drain** (for the internal exhaust system)

Connection kit:

- **2 × DN32 connection pipes,** 1 m long, with shut-off valves and 1½″ female thread (HKVL/HKRL)
- **1 × DN20 gas connection pipe,** length 1 m, with R1″ male thread, tapered seal, including gasket for gas connection (flexible)

Appendix
for fuel gas quality

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The minimum quality requirements for the fuel gases used to operate the A-TRON combined heat and power plants are specified below. The specified limit values are mandatory and must be ensured through a detailed gas analysis of the respective fuel gases throughout the entire operation

In the case of variable gas composition—such as from biogas or sewage gas plants—the gas quality must be ensured by shortening the analysis intervals as appropriate. Operating the combined heat and power plant using a fuel gas that falls below or exceeds the listed limit values may result in the loss of the warranty claim

All power and efficiency specifications apply under standard conditions and when operating on natural gas (calorific value Hi = 9.5 kWh/m³). The listed values are based on a return temperature of 35 °C, a relative humidity of 30%, an air pressure of 1013.25 mbar, and an intake air temperature of 20 °C. All values specified here are subject to a tolerance of ±5%.

Deviations may occur under other operating conditions.

Name	Unit	Limit Values			
Fuel gas	[-]	**Natural gas**	**Liquid gas**	**Biogas**	**Sewage gas**
Gas pressure	[mbar]	> 18			
Methane	[%]	>85		> 45	> 57
Methane number	[-]	>80		> 130	
Alkanes (ethane, propane, butane, pentane)	[%]	< 15	n.a.	n.a.	n.a.
Inert gases	[%]	< 15	n.a.	n.a.	n.a.
Oxygen	[%]	n.a.	n.a.	< 2	< 10
Nitrogen	[%]	n.a.	n.a.	< 10	< 20
Carbon dioxide	[%]	n.a.	n.a.	< 55	< 43
Calorific value	kWh/Nm³	> 5			
	Vol%kWh/mn³	< 10			
Chlorine content	[mg/Nm³]	< 80			
Fluorine content	[mg/Nm³]	< 40			
Total chlorine + fluorine	[mg/Nm³]	< 80			
Sulfur content	[mg/Nm³]	< 200			
Hydrogen sulfide	[mg/Nm³]	< 200			
Ammonia content	[mg/Nm³]	< 30			
Tar content	[mg/Nm³]	< 50			
Oil vapors	[mg/Nm³]	< 400			
Silicon content	[mg/Nm³]	< 2			
Solids < 3 µm	[mg/Nm³]	< 8			
Relative humidity	[%]	< 60			