



Biogas Combined Heat and Power Unit

ENERGIN® M12 CHP B500

Datasheet, 500 mg NO_x, EXHE 120 °C

The ENERGIN® CHP combined heat and power unit simultaneously generates electricity and uses the heat from the engine jacket water and exhaust to heat water. The power output can be controlled between 50 and 100 % of nominal rating. It can be operated in parallel with the public network or with an isolated load. As an option, automatic emergency operation and/or island-parallel operation with other generators is possible.

The unit is supplied as a compact, fully functional unit, with or without a sound attenuating enclosure. The engine, generator, heat exchangers for oil and jacket water and exhaust as well as the control and power panel are mounted, ready for operation on the vibration-decoupled base frame. A lubrication oil system, which allows operation of up to 2000 hours without manual lube oil refilling, is integrated on the unit.

The electrical control system provides protection and control functions for automatic or manual operation. A 12" touch panel informs about operating conditions and allows the operation and parameterization of the system. Various interfaces are available for communication with other power generators and an overhead control system. An Ethernet interface allows connection to the Internet for remote monitoring and remote maintenance.

The entire system is certified according to the BDEW medium voltage directive (Grid code).

TECHNICAL DATA

Manufacturer		R Schmitt Enertec
ENERGIN® Type		M12 CHP B500
Electrical power ¹	kW	500
Thermal power ²	kW	522
Gas consumption ³ (LHV)	kW	1.170
Self consumption ⁴	kW	8,3

DESIGN

Fuel type		Biogas (50% Methane)
Lower heating value LHV	kWh/Nm ³	5,0
Gas flow pressure ⁵	kPa	3,5 - 5,0
Inlet air temperature	°C	20
Exhaust temperature	°C	120
Hot water temperature ⁶	°C	70 / 90
Hot water flow rate	m ³ /h	23,0

EXHAUST EMISSIONS⁷ WITHOUT CATALYST

NO _x ⁸	mg/Nm ³	500
CO	mg/Nm ³	1000
Formaldehyde	mg/Nm ³	100

ENGINE

Manufacturer		R Schmitt Enertec
ENERGIN® Type		M12-BT2D41
Working principle		4-stroke
Cylinder configuration		12 in V / 90°
Valves per cylinder		4
Aspiration		turbocharged
Mixture cooling		2-staged
Displacement	ltr	22,6

LUBE OIL

Lube oil volume	ltr	240
Make up tank volume	ltr	157
Consumption	ltr/OH	0,14

ALTERNATOR

Manufacturer		Leroy Somer
Type		LSA 49.3 M6
Voltage	V / Hz	400 / 50
Speed	1/min	1.500
Efficiency	%	96,1



PERFORMANCE⁹

Load		100 %	75 %	50 %
Electrical power	kW	500	375	250
Thermal power	kW	522	410	310
Fuel consumption	kW	1.170	897	642
Gas flow at LHV	Nm ³ /h	235	180	129
Electrical efficiency	%	42,7	41,8	38,9
Thermal efficiency	%	44,6	45,7	48,3
Total efficiency	%	87,3	87,5	87,2
Exhaust gas flow ¹⁰	m ³ /h	2.540	1.849	1.256
Air requirement	m ³ /h	11.297	9.055	7.297
Exhaust air ¹¹	m ³ /h	9.371	7.652	6.345

DIMENSIONS AND WEIGHTS WITH SOUND ENCLOSURE

Length	mm	4.500
Height	mm	2.400
Height with 90° elbow	mm	3.550
Width	mm	1.440
Dry weight	kg	6.670
Operational weight	kg	7.200

CONNECTIONS

Exhaust	DN / PN	250 / 10
Fuel gas	DN / PN	80 / 16
Exhaust air	mm	850 x 850
Emergency cooling	DN / PN	80 / 16
Mixture	DN / PN	50 / 16
Process water	DN / PN	65 / 16
Exhaust condensate	DN / PN	Rp 1/2"

¹ +0 % tolerance on electrical power output

² - 3/+ 8 % tolerance for thermal power @ 120 °C

³ +5 % tolerance on fuel consumption

⁴ average self consumption without emergency cooling

⁵ maximum variation of 10 % for set value

⁶ Return/flow temperature

⁷ Exhaust emissions related to 5 % oxygen in dry exhaust

⁸ Setup for 250 mg/Nm³ NO_x possible (changed performance data)

⁹ at standard conditions according to ISO 3046-1; cos φ = 1

¹⁰ wet exhaust gas at 120 °C

¹¹ ΔT = 15 K



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