



Biogas Combined Heat and Power Unit

ENERGIN® M12 GEN+ B400

Datasheet, 500 mg NO_x

The ENERGIN® GEN+ combined heat and power unit simultaneously generates electricity and uses the heat from the engine jacket water to heat water. 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 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 GEN+ B400	
Electrical power ¹	kW	400
Thermal power ²	kW	241
Gas consumption ³ (LHV)	kW	955
Self consumption ⁴	kW	5,7

DESIGN

Fuel type	Biogas	
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	488
Hot water temperature ⁶	°C	70 / 85
Hot water flow rate	m ³ /h	14,3

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-BTID41	
Working principle	4-stroke	
Cylinder configuration	12 in V / 90°	
Valves per cylinder	4	
Aspiration	turbocharged	
Mixture cooling	internal	
Displacement	ltr	22,6

LUBE OIL

Lube oil volume	ltr	205
Make up tank volume	ltr	170
Consumption	ltr/OH	0,13

ALTERNATOR

Manufacturer	Leroy Somer	
Type	LSA 47.2 M8	
Voltage	V / Hz	400 / 50
Speed	1/min	1.500
Efficiency	%	96,2



PERFORMANCE⁹

Load		100 %	75 %	50 %
Electrical power	kW	400	300	200
Thermal power	kW	241	183	139
Fuel consumption	kW	955	732	524
Gas flow at LHV	Nm ³ /h	192	147	105
Electrical efficiency	%	41,9	41,0	38,2
Thermal efficiency	%	25,2	25,0	26,5
Total efficiency	%	67,1	66,0	64,7
Exhaust gas flow ¹⁰	m ³ /h	3.863	2.948	2.096
Air requirement	m ³ /h	9.661	7.687	6.052
Exhaust air ¹¹	m ³ /h	8.176	6.593	5.300

DIMENSIONS AND WEIGHTS WITH SOUND ENCLOSURE

Length ¹²	mm	4.380
Height	mm	2.030
Height with 90° elbow	mm	3.190
Width	mm	1.440
Dry weight	kg	4.860
Operational weight	kg	5.270

CONNECTIONS

Exhaust	DN / PN	150 / 10
Fuel gas	DN / PN	65 / 16
Exhaust air	mm	850 x 850
Emergency cooling	DN / PN	65 / 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 @ 488 °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 488 °C

¹¹ ΔT = 15 K

¹² without optional heating water pump group



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