Technical datasheet of CHP unit

GT-MBGS 300LE252-AS

480 V / 60 Hz		Biogas
Electric power	kW	327
Total thermal output	kBTU/hr	1365
Energy input	kBTU/hr	3000
Fuel consumption	SCFM	90.9
Electrical efficiency	%	37.2
Thermal efficiency with LT	%	46.9
Thermal efficiency without LT	%	45.5
Overall efficiency with LT	**%**	**84.1**

Engine: MAN Type: E3268 LE252

No. of cylinders / configuration	-	8V
Engine speed	rpm	1800
Bore / stroke / displacement	in / in / cu in	5.2/6.18/1049
Compression ratio	-	12
Engine power max.	kW	340
Spark plugs type	-	M18
Lube oil consumption max.	lb/h	0.331
Lube oil filling quantity max.	US gal	30.0

Alternator: Leroy-Somer Type: LSA 47.3 S4

Voltage / frequency	V/Hz	480/60
PF	-	0.8L / 0.8C
Alternator efficiency at rated power	%	96.3
Max. ambient temperature	°F	104

Energy balance

					CHP unit performance parameters at rated load
Load	%	**100**	**75**	**50**	**100**
ISO standard engine power	kW	340	255	170	**340**
Electric power	kW	327	246	162	**327**
Engine cooling thermal output	kBTU/hr	634	547	448	**634**
Exhaust gas thermal output (356 °F)	kBTU/hr	645	508	346	**645**
Thermal output mixture cooling - HT	kBTU/hr	87	31	0	**87**
Thermal output mixture cooling - LT	kBTU/hr	43	31	18	**43**
Total thermal output	kBTU/hr	1365	1086	794	**1365**
Radiation heat max.	kBTU/hr	120	92	81	**120**
Energy input 1)	kBTU/hr	3000	2313	1651	**3000**
Fuel consumption	SCFM	90.9	70.1	50.0	**90.9**
Combustion air mass flow	lb/hr	3560	2712	1885	**3560**
Exhaust gas mass flow, wet	lb/hr	3957	3018	2101	**3957**
Exhaust temperature after turbocharger	°F	919	937	950	**919**
Alternator efficiency at PF=1	%	96.3	96.3	95.4	**96.3**
Electrical efficiency 1)	%	37.2	36.2	33.5	**37.2**
Thermal efficiency	%	45.5	46.9	48.1	**45.5**
Overall efficiency without LT	**%**	**82.7**	**83.1**	**81.6**	**82.7**

1) According to ISO 3046.

Fuel: Biogas

Min. methane number	-	100
Lower calorific value	BTU/SCF	550
Biogas composition $CH_4/C0_2$	% vol./% vol.	60/40
Gas pressure at gas regulation line inlet 1)	psi	0.58÷1.45
Max. gas temperature	°F	30

1) The gas regulation line for MAN engines is standardly dimensioned at 0.58 ÷ 0.73 psi.

Heating water circuit

Thermal output	kBTU/hr	1365
Temperature gradient	°F / °F	194 / 158
Cooling medium volume flow min.	GPM(US)	77.52
Pressure loss of heating circuit 1)	psi	1.74
Heat transfer medium	-	Treated water
Max. operating pressure	psi	87

1) Pressure loss of all heating water circuit components at GENTEC CHP scope of supply.

LT mixture cooling circuit

Thermal output	kBTU/hr	43
Temperature gradient	°F / °F	114.8 / 107.6
Cooling medium volume flow min.	GPM(US)	13.05
Max. allowable pressure loss 1)	psi	2.9
Heat transfer medium concentration - glycol / water	% vol./% vol.	40/60
Max. operating pressure	psi	43.5
Dry cooler acoustic sound pressure level at 33 ft 2)	dB(A)	65
Max. ambient temperature	°F	95

1) Pipework between CHP unit and dry cooler.

2) The value of the sound pressure level is considered in free field.

Emergency cooler

Thermal output	kBTU/hr	1365
Heat transfer medium	-	Ethylene glycol/Water-40/60 % vol.
Max. allowable pressure loss 1)	psi	2.2
Dry cooler acoustic sound pressure level at 33 ft 2)	dB(A)	65
Max. ambient temperature	°F	95

1) Pipework between CHP unit and dry cooler.

2) The value of the sound pressure level is considered in free field

Ventilation and combustion air

Fan air volume flow 1)	GPM(US)	45400
Max. allowable pressure loss of air duct 2)	mpsi	7.3
Max. inlet air temperature	°F	95

1) At temperature 95 °F and pressure 14.69 psi.

2) Air ducts between CHP unit and air inlet/air outlet.

Exhaust gas system

Exhaust gas mass flow, wet	lb/hr	3957
Exhaust gas temperature at CHP unit outlet	°F	356
Max. allowable pressure loss 1)	mpsi	87
Silencer flanges 2)	-	DN250-PN10

1) Exhaust gas pipe between CHP unit and outlet excluding components at GENTEC CHP scope of supply.

2) According to EN 1092-1.

Emissions

CO	g/bhp-h	<1.559
NO_x	g/bhp-h	<1.115

Correlation 15% O_2 and at exhaust gas density 0.0326 g/SCF

Noise level

CHP unit design without canopy 1)	dB(A)	90
CHP unit design with canopy 1)	dB(A)	74
Exhaust gas noise at 3 ft distance to silencer outlet 3)	dB(A)	80
Input/Output air ventilation 1)	dB(A)	80/80

All values of the sound pressure level is considered in free field.

1) Sound pressure level measured at 3 ft distance from the CHP unit.

2) Sound pressure level measured at 33 ft distance from the container.

3) On request, noise can be reduced by additional optimization of the standard silencer.

Dimensions and weight

Canopy dimensions L/W/H	in	177.2/76.8/86.6
Dry weight of CHP unit design with canopy	lbs	16094

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Standard conditions and tolerances

Atmospheric pressure	psi	14.5
Air temperature	°F	77
Relative air humidity	%	30
Tolerance for the electrical power	%	±3
Tolerance for the usable thermal output	%	±7
Tolerance for the specific fuel consumption	%	+5

The energy balance parameters listed in this data sheet are related to the standard conditions.

Detailed technical specifications of components on demand.

Change of technical parameters and printing errors reserved.

Release date	Created	Revision	Project / Offer
2205	MŠ	0	