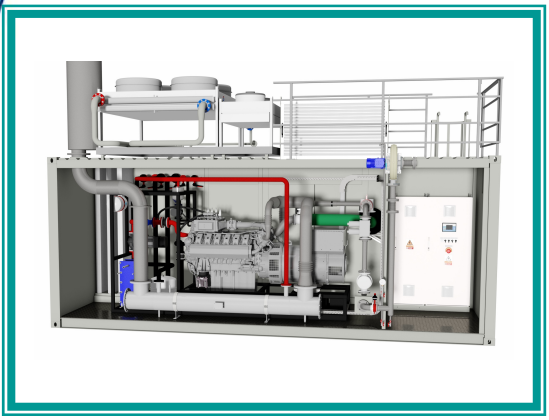
Spec Sheet: Biogas CHP

KRAFT ENERGY SYSTEMS
COMBINED HEAT AND POWER

Biogas CHP Modules:



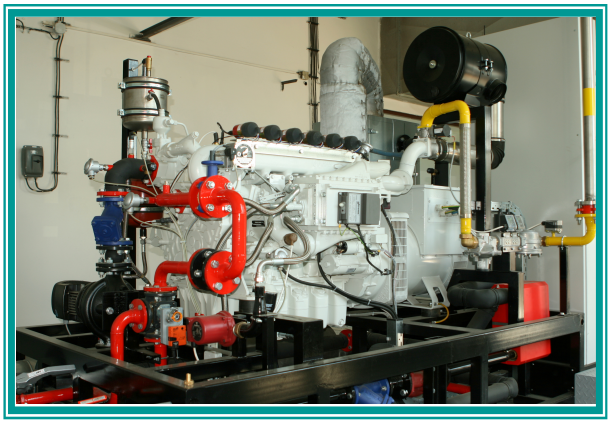
Kraft Energy Systems provides reliable and efficient combined heat & power equipment solutions for the waste water and solid waste industry.

Successful CHP projects require an experienced and responsive supplier who also provides expert field service after the sale. Kraft Energy Systems is that brand.

MAN

The Kraft Energy Systems Advantage:

- Over 50 Years of Power Generation Experience
- Active Engineering Support
- Long Term Service Agreements
- 24 x 7 Emergency Service Response
- Lower Energy Cost
- Low exhaust emissions levels



- Robust, Reliable and Fuel Efficient Industrial Engines
- Fully Automated & User Friendly Control System with Remote Access & Monitoring
- Standardized Package 0ptions, Indoor/Outdoor
- Quiet Indoor/Outdoor Enclosed Design or Open Unit
- Standard Closed Loop Hot Water Recovery System
- Pre-manufactured Modules Reduce Installation Cost
- Standardized Utility Inter-tie Controls, Relay Options
- Dual Gas Train Option, (biogas/natural gas)
- Biogas Models from 64 kWe - 550 kWe

CHP
EPA COMBINED HEAT AND POWER PARTNERSHIP

KRAFT ENERGY SYSTEMS
COMBINED HEAT AND POWER

CHP
EPA COMBINED HEAT AND POWER PARTNERSHIP

MAN

CHP UNIT MODEL		KB 60	KB 100	KB 180C	KB 240	KB 375	KB 430	KB 550
MAN Engine Model		E 0834 LE302	E 0836 LE302	E 2676 LE 212	E 2676 LE212	E 3268 LE222	E 3262 LE242	E 3262 LE212
Generator Model		LSA 44.3 S3	LSA 44.3 M6	LSA 46.3 S4	LSA 46.3 M7	LSA 47.2 S5	LSA 47.2 M7	LSA 49.3 S4
Electric Output	kWe	64	104	180	239	373	430	550
Thermal Output	BTU/Hr	306,000	488,000	762,000	965,000	1,393,000	1,761,000	2,216,000
Fuel Consumption (LHV)	BTU/Hr	625,000	1,004,000	1,704,420	2,184,000	3,263,000	3,969,000	4,958,000
Electric Efficiency	%	34.8	35.5	36.0	37.3	39.0	37.0	37.9
Thermal Efficiency	%	49.0	48.7	44.6	44.2	42.7	44.4	44.7
Combined Efficiency	%	83.8	84.1	80.7	81.4	81.7	81.4	82.6
Displacement	cu in	279	419	757	757	1,049	1,573	1,574
BMEP	psi	172.6	155.2	149.9	197.3	219.4	168.2	217.4
Bore & Stroke	in	4.25 × 4.92	4.25 × 4.92	4.96 x 6.54 in	4.96 × 6.54	5.20 × 6.18	5.20 × 6.18	5.20 × 6.18
Engine Horsepower	BHP	91	148	254	335	523	603	778
Cylinder Arrangement		4 / IL	6 / IL	6 / IL	6 / IL	8 / V	12 / V	12 / V
Compression Ratio		11 : 1	11 : 1	14 : 1	14 : 1	13.6 : 1	12 : 1	13.6 : 1
Sound Level @ 1m	dB(A)	75 +/- 3	75 +/- 3	75 +/- 3	75 +/- 3	75 +/- 3	75 +/- 3	75 +/- 3
Process Water Flow - 180/160 °F	GPM @ 20 °F rise	31	50	78	99	142	180	226
Process Water Temperature	°F	180	180	180	180	180	180	180
Exhaust Flow	lbs/hr	816	1,307	3,020	3,161	4,356	5,265	6,687
Exhaust Temperature	°F	356	356	356	356	356	356	356
NOx emission*	g/BHP-hr	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
CO emission*	g/BHP-hr	< 2.5	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
NMHC emission*	g/BHP-hr	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Gas Pressure (Min)	in WC	10	10	10	10	10	10	10

* Correlation 15% O_2. Lower NOx levels possible on request.

Tech Data is based on 60% Methane / 40% Carbon Dioxide fuel gas mixture with calorific value of 580 BTU/ft^3. Gas quality must meet engine manufacturer's specifications.

Tech Data is based on standard conditions in accordance with ISO 3046-1. Atmospheric pressure: 14.5 psi or 328 feet above sea level, Air Temperature : 77 degrees F, Relative Humidity: 30%

Tolerances: Fuel Consumption + 5%, Thermal Output +/- 8%

Sound Level Rating applies to Indoor Enclosed Module. Sound Level Rating applicable to Outdoor Enclosed Module is 65 dB(A) +/- 3 @ 10 m

Heat transfer data is based on 40% glycol mixture

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