



STANDARD EQUIPMENT

- **Biogas Engine and Synchronous Generator** connected with flexible coupling
- **Digital Electronic Ignition**
- **Heat Exchangers** for jacket water and exhaust piped and insulated at the factory
- **Electric Circulation Pump** for jacket water, with electric temperature control valve
- **Electric Circulation Pump** for Inter cooler water
- **Secondary Exhaust Silencer**
- **Vibration Isolators** between engine/ generator and base frame as well as between base frame and foundation
- **Sound Attenuated Enclosure**, 72-75 dB(A) avg. at 3 ft, for indoor installation, with ventilating fan
- **Utility Grade Protective Relay**
- Electrically operated **Power Circuit Breaker** with trip unit
- 24 V maintenance-free **Batteries**, 10 amp **Battery Charger**
- **Hot water temp up to 190 °F**
- **Lube Oil Make-up System** with 15 gal storage tank, unit mounted
- **Electric Pre-lubrication Pump**
- **Dual Solenoid Gas Train**, with zero pressure regulator per NFPA 37
- **Low Fuel Pressure** system 0.5-3 PSI
- **Remote Monitoring**

KMBL-60-4SH

KRAFT ENERGY / MAN Biogas Engine

Electrical Output	60 kW
Thermal Output	312,064 BTU/hr
Fuel Consumption	9,913 BTU/kWhe
Overall Efficiency	86.88 %

BENEFITS

- **Most Reliable MAN Gas Engines**
- **Turbocharged & Intercooled Engine**
- **High Efficiency**
- **Low Emissions**
- **Compact Design**
- **Easy On-site Installation**
- **PLC-based Digital Controls**
- **Remote Communication Capabilities**

OPTIONAL EQUIPMENT

- **Outdoor Enclosure**
- **Remote Heat Dump Radiator**
- **Induction Type Generator**
- **Secondary Exhaust Silencer**
- **Electric Circulation Pump for Process Hot Water**
- **Hot Water Temperature Control Valve**
- **Load Sharing Controls for Multiple Unit Applications**
- **Island Mode Operation Capability**

TECH DATA: KMBL-60-4SH - Biogas

		100%
MAN Engine Model		E 0834 LE 302
Generator Model		UCI224G
Electric Output	kWe	60
Amps @ 480 Volts @ 0.8 P.F.	Amps	90
Amps @ 208 Volts @ 0.8 P.F.	Amps	208
Max. Engine BHP	BHP	91
Number of Cylinders/Arrangement		4 IL
Bore & Stroke	Mm	4.25 x 4.92
Displacement	Ltrs (cu in)	4.58 (279)
BMEP	Psi	173
Compression Ratio		11:1
Combustion Air Required	Scfm	151
Generator Cooling Air Required	Scfm	595
Total Air Required	Scfm	746
Fuel Consumption	Th/Hr	5.95
Electric Heat Rate (LHV)	BTU/kWe	9,913
Hot Water Recovery - Jacket Water & Exhaust Combine		
Cogen Thermal Output	kW	91.45
Thermal Output	Th/Hr	3.00
Recoverable Heat from Jacket	BTU/Hr	122,621
Recoverable Heat from Exhaust	BTU/Hr	189,484
Total Heat Recovered	BTU/Hr	312,064
Process Water Flow	GPM @ 15° F Rise	41
Process Water Temp	Deg F	190
Exhaust Flow	Lbs/Hr	816
Exhaust Temp	Deg F	842
Efficiencies		
Electrical Efficiency	%	34.42
Thermal Efficiency	%	52.46
Combined Efficiency	%	86.88
Environmental		
Emissions at 100% Load (Correlation 5% O2)		
Post Catalyst NOx Emission	Gms/BHP-Hr (ppm)	<1.0 (<91)
Post Catalyst CO Emission	Gms/BHP-Hr (ppm)	<2.5 (<300)
NMHC	Gms/BHP-Hr (ppm)	<0.2 (<36)
Sound Level at 1 Meter	dBA	73-75
Steady State Gas Pressure-min	Inches of WC	10
Steady State Gas Pressure-max	Inches of WC	40
Dimensions	Inches	150 x 65 x 98
Weight	Lbs.	6,000
i) Tech data is based on a gas mixture of 60% methane and 40% carbon dioxide with a calorific value of 580 Btu/cu ft. ii) Gas quality must be per engine manufacturer's specifications & must be cleaned, if necessary. iii) Tech data is based on standard conditions acc to DIN ISO 3046-1. Standard conditions: atmospheric pressure: 14.5 psi or 328 ft above sea level, air temperature: 77 deg F, relative humidity: 30%. iv) The coolant data is based on 40% antifreeze.		

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