



# ALL POWER LABS

## Personal-Scale Power

### POWER CUBE - PC20

RENEWABLE  
AFFORDABLE  
ON-DEMAND  
POWER



The **Power Cube PC20** is a sensible solution to the critical global need for low-carbon energy, using agricultural and forestry waste materials to make on-demand renewable energy for a fraction of the cost of comparable diesel power.

APL's unique patented multi-stage gasification architecture, in combination with our innovative gasifier-engine thermal integration, our electronic control system and waste-heat recycling, gives the Power Cube unprecedented biomass fuel flexibility & efficiency; every 1.15 kg of biomass creates a kilowatt hour of power.

More than just electricity, the PC20 also has the option of an integrated Combined Heat and Power (CHP) module, providing up to 30 kW of thermal energy for heating and drying, with no drop in power production.

Quiet, compact and portable, the PC20 is easily transported to where the fuel is and where the power is needed. Its sleek stainless steel enclosure, sound insulation, emission controls and CE conformity allow for installation in almost any setting.

Proudly made in California, the Power Cube PC20 is now available at an affordable price.

SPECIFICATIONS	PC20	PC20 CHP
Maximum Continuous Power Output <sup>1</sup>	50 Hz = 15 kW 60 Hz = 18 kW	50 Hz = 15 kW 60 Hz = 18 kW
Sound Insulation	✓	✓
Sound Level @ 10 meters	65 db(A)	65 db(A)
Emissions - Meeting EU & US targets <sup>2</sup>	✓	✓
Full Enclosure - Stainless Steel Panels	✓	✓
Site Requirements - Well-Ventilated Protected From Rain & Direct Sun	✓	✓
Installed Footprint Not including ash vessel & grid tie enclosure	136 x 136 cm	136 x 136 cm
Shipping Dimensions PC20 - Crated Accessories- Crated	178 x 178 x 157 cm 125 x125 x 127 cm	178 x 178 x 165 cm 125 x125 x 127 cm
Shipping Weight PC20 - Crated Accessories- Crated	1175 kg 210 kg	1250 kg 225 kg
CE Conforming	✓	✓

<sup>1</sup> Actual power will vary depending on fuel type, shape, energy density and moisture content.

<sup>2</sup> Emissions: <200 mg/m<sup>3</sup> CO, <650 mg/m<sup>3</sup> NOx, both @ 5% O<sub>2</sub>. Check local emissions requirements.

### BIOMASS FEEDSTOCK

Size	12-40 mm (1/2 inch - 1 1/2 inch)
Moisture Content	10-30% dry basis
Approved and Tested <sup>3</sup> with normal operating procedures	Nut Shells (e.g. Walnut, Hazelnut) Softwood Chips (e.g. Fir, Pine) Hardwood Chips (e.g. Oak, Ash)
Approved and Tested <sup>3</sup> with increased operating effort	Corn Cobs Coconut Shells Palm Kernel Shells
Not Approved Dangerous & Will Void Warranty	Coal Tires Medical Waste Plastic Municipal Solid Waste

<sup>3</sup> Warranty coverage for use with any particular species of feedstock requires specific testing and approval. Visit <http://www.allpowerlabs.com/fuels> for the most current information on feedstock suitability.

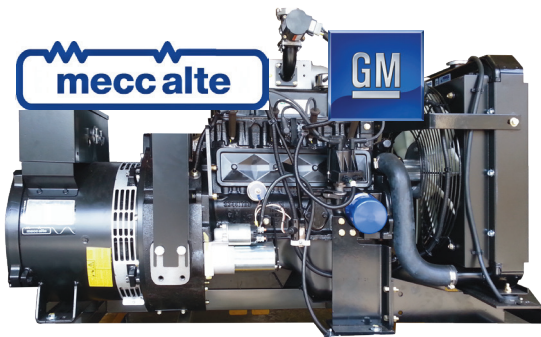
### FUEL COST COMPARISON

FUEL	PRICE RANGE
Diesel	€0.50 - €1.00/kWh
Gasoline	€0.70 - €1.50/kWh
LPG/Propane	€0.40 - €0.75/kWh
<b>Gasified Biomass</b>	<b>€0.00 - €0.25/kWh</b>

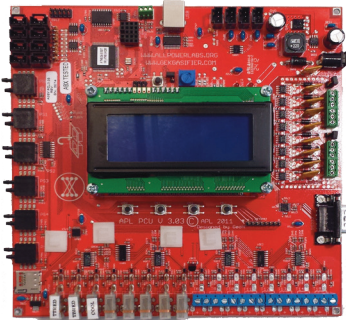
All specifications are subject to change without notice



v5 GEK TOTTI Gasifier



Meccalte NPE32 Genhead GM Vortec 3.0 IC Engine



APL Custom Process Control Unit



Deep Sea Grid Tie Control Unit

## GASIFIER SYSTEM

FEATURES	PC20	PC20 CHP
GEK TOTTI Gasifier - Multi-stage, Zone-Separated Heat-regenerating, High-Efficiency Architecture	v5	v5
Fuel Moisture Tolerance	30%	30%
Biomass to Power Conversion Efficiency <sup>4</sup> Dry Basis	1.15 kg = 1 kWh	1.15 kg = 1 kWh
High Performance Neutral-Vane Cyclone	✓	✓
Multi-stage Packed Bed Filter	✓	✓
Continuous Char/ash Removal from Gasifier <sup>5</sup> 12-24 hr. service period	✓	✓
Continuous Cyclone Particulate Removal <sup>5</sup> 12-24 hr. service period	✓	✓
Continuous Fuel Feed via Airlock Including hopper, air lock, level sensing & ECU	✓	✓

<sup>4</sup> Energy density of any given feedstock varies depending on various factors such as fixed carbon content.

<sup>5</sup> Char/ash & particulate byproducts vary depending on fuel type, shape, energy density & moisture content.

## ENGINE & GENERATOR

FEATURES	PC20	PC20 CHP
GM Vortec 3.0 Liter 4 cylinder, inline, pushrod, industrial engine	✓	✓
Electronic Woodward Governor	✓	✓
Automated Syngas/Air Mixture Control	✓	✓
Exhaust Cleanup <sup>6</sup> Dual Catalytic Converter	✓	✓
Meccalte 12 wire genhead 1 or 3 phase, 50/60 Hz, all common global voltages	✓	✓
Grid Tie System - including controls & contactor	✓	✓
Paralleling Capable	✓	✓

<sup>6</sup> Emissions: <200 mg/m<sup>3</sup> CO, <650 mg/m<sup>3</sup> NOx, both @ 5% O<sub>2</sub>. Check your local emissions requirements.

## AUTOMATION SYSTEM

FEATURES	PC20	PC20 CHP
Full Temperature & Pressure Instrumentation	✓	✓
Smart Grate, Fuel & Ash Auger Control	✓	✓
Diagnostic Messages for Error Recovery	✓	✓
User-Configurable Setpoints For all critical systems	✓	✓
Datalogging for Gasifier	✓	✓
Datalogging for Power Generation	✓	✓

## COMBINED HEAT & POWER SYSTEM (CHP)

FEATURES	PC20	PC20 CHP
Combined Coolant & Exhaust Heat Recovery Maximum Usable Thermal Output	NA	>30 kWt @ 15 kW
Total System Efficiency - Electricity plus Heat Will vary depending on calculation parameters	NA	>70%

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