



### POWER PALLET - PP30

**RENEWABLE  
ON-DEMAND  
POWER**



The new **Power Pallet** PP30 25 kW genset is a renewable power solution that is a sensible answer to a critical need for distributed low-carbon energy. With standard grid-paralleling functionality, Combined Heat & Power, engine enclosure, and emissions control, the new PP30 meets the needs of modern, demanding power standards.

APL's unique patented multi-stage gasification architecture, in combination with our innovative gasifier-engine thermal integration, electronic control system and waste-heat recycling, gives the Power Pallet unprecedented biomass fuel flexibility and efficiency.

The Power Pallet uses agricultural and forestry waste materials that can be readily sourced very near the point of generation. It is compact and portable, easily transported to where the fuel is and where the power is needed. Unlike diesel fuel or gasoline, this fuel is often available at little or no cost, and most importantly, depending on feedstock selection and use details, the Power Pallet is capable of carbon-negative operation.

#### FUEL COST COMPARISON (VARIES by REGION)

Diesel/LPG	\$0.25 - \$0.75/kWh
Gasoline	\$0.25 - \$0.75/kWh
Gasified Biomass	<b>\$0.00 - \$0.06/kWh</b>

#### PERFORMANCE

Electrical Power: Continuous:	25 kW@60 Hz / 22 kW@50 Hz
On-grid with CHP:	27 kW@60 Hz / 24 kW@50 Hz
Sound Level @ 7 meters:	75 dB(A)
Biomass Consumption:	1.0 kg/kWh (dry basis)
Run Time per Hopper Fill:	5 kW: 12 hrs
Approximate @	10 kW: 6 hrs
250 kg/m <sup>3</sup> Fuel Density	15 kW: 4 hrs
Max. Continuous Operation:	>16 hours
Start Up Time:	10-15 minutes

#### COMBINED HEAT & POWER (CHP)

Electrical Efficiency:	~23% (woody biomass, LHV) ~28% (syngas)
Electrical+Thermal Efficiency:	>65% (biomass)
Gasifier HX+Engine Cooling+Exhaust HX:	>80% (syngas) (3 stage)
CHP Heat Output:	3 stage: 2.0 kWth per 1 kWe 2 stage: 1.5 kWth per 1 kWe
Engine Coolant: Working Fluid:	Up to 50% PEG
Temperature Range:	75-95°C (165-205°F)
Customer-side CHP: Loop Temp.	75-90°C (165-195°F)
Minimum Flow Rate @ 50 kWth:	2.2 m <sup>3</sup> /hr (9.5 GPM)
Minimum Heat Delivery:	0 kWth (native radiator backup)
Plumbing Connection:	1.5 inch sanitary fitting

#### GRID TIE / PARALLELING

Controller:	DeepSea DSE8610 MKII
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#### OPERATING CONDITIONS

Ambient Temperature:	5-40°C/40-100°F
Ambient Relative Humidity:	5-95%
Installed Footprint:	1.78 x 1.42 x 2.24 meters 75 x 56 x 88 inches
Site Requirements: Outdoor:	1.75 m Overhead Clearance Well-ventilated, Level Pad, Covered from Rain and Direct Sun
Enclosed or Poorly Ventilated:	Forced Convection Hood Over Flare

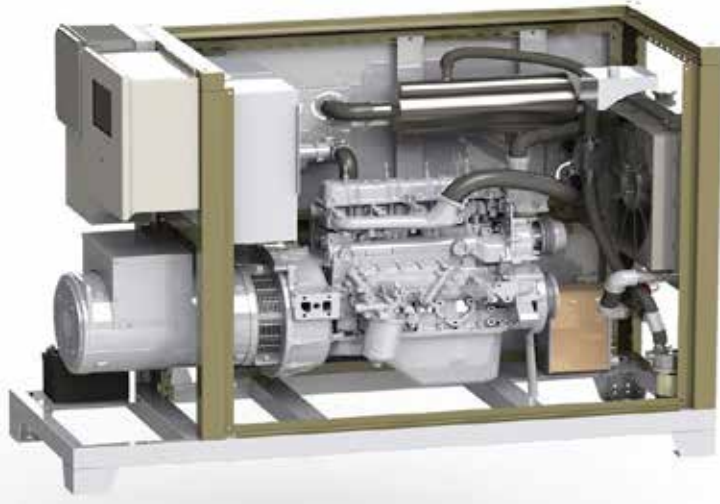
#### SHIPPING

Dimensions:	Main Crate: 185 x 145 x 140 cm / 73 x 57 x 55 in. Hopper Crate: 83 x 83 x 114 cm / 33 x 33 x 45 in.
Weight:	Main Crate: 1130 kg / 2500 lbs. Hopper Crate: 91 kg / 200 lbs.

#### GAS FILTRATION

Dry Filtration System:	Cyclone+Bag House Gang Clean-in-place Shaker System Prevents Tar and H <sub>2</sub> O Condensation
HX Temp Control:	
Gas Cooling Pre-filtration:	Engine Coolant HX Controls to 80-100°C HX In-situ Cleanable

All specifications are subject to change without notice



## ALL Power Labs

APL is the global leader in small-scale gasification technology. We make biomass-fueled power generators that are ready for everyday work, to serve real-world, distributed-energy needs. Our compact gasifiers are now at work in over thirty countries, and support research at more than fifty universities around the world.

Our APL team is an unusual combination of hands-on fabricators and university-trained scientists and engineers. The result is a powerful combination of technical ability and physical know-how for developing innovative energy solutions.

We are deeply committed to supporting and developing biomass energy conversion by curating and disseminating comprehensive information and data on gasification science and technology—online, in workshops, and free open house events.

Our facility is in Berkeley, CA. Please contact us to arrange a visit the next time you are in the Bay Area. We would love to show you around.



## WARRANTY

ALL Power Labs products are covered by a 100% money back guarantee. If you buy something & find yourself unimpressed with the value of the product or company, we'll refund all your money (minus shipping costs) within 30 days of delivery. APL directly warrants all parts we manufacture (i.e. gasifiers, electronics, & related components) for two years or 4000 hours, & passes along the OEM warranty for parts we source & configure into our end products (e.g. engines & genheads). See <http://allpowerlabs.com/products/warranty> for full details.

## GAS-MAKING SYSTEM

Gasifier Type:	APL v5.x Patented Multistage Heat Recycling Downdraft
Materials:	304/310/321 SS / Mild Steel
Hearth:	Coated Ceramic
Char-Ash Removal:	Automated Auger to 16 hour batch vessel
Fuel Feed:	Automated: Hopper to Reactor
Hopper Capacity:	333 liters (88 gallons)
Hopper Filling: Batch:	Manual while operating
Automatic:	Continuous Feed Gate (optional)
Control System:	On-Board Automation
Flare: Clean Swirl Combustor	Auto Ignitor / Manual Mixture

## ENGINE

Type:	Ashok Leyland: Hino-Toyota Design
Displacement:	4.0 liter
Cylinder Configuration:	Inline 4 cylinder
Compression Ratio:	12:1
RPM:	1500 @50 Hz, 1800@60 Hz
Valve Configuration:	Overhead, Pushrod
Engine Block:	Cast Iron: Industrial Diesel Based Cylinders Lined for In-frame Rebuild
Pistons:	Aluminum Alloy: Center Dished Ring-trench Inserts Prevent Sticking
Cylinder Head: Circumferal Squish Combustion	Cast Iron Crossflow w/ Hardened Exhaust Inserts
Ignition:	Electronic: ECU Controlled
Lube Oil Capacity:	8 liters (8.5 quarts)
Coolant Capacity:	15 liters (16 quarts)
Auto Shutdown:	Low Oil Pressure High Coolant Temperature
System voltage:	12 VDC
Charging System: AC Genhead	Switch-mode Charger
System Voltage:	12 VDC
Recommended Battery:	Grp 24 Marine: 75Ah, 880 CCA
Auxilliary Components: ECU Controlled 12 VDC	Cooling Fans Water Pump
Auxillary Parasitic Load	850 Watt, 300 Watt w/o Radiator
Speed Control: Elect. Gov.	Woodward L-Series
Automated Mixture Control	Bosch Wide-Band O <sub>2</sub> Sensor

## GENERATOR

Type:	Marathon 284CSL1542, 12 wire
AVR:	DSE A106 MK II
Available Voltages:	120-277, 240-480 VAC
Available 3 $\phi$ Topologies:	Series or Parallel, Delta or Star
Total Harmonic Distortion:	<5%
Efficiency:	92%
Motor Surge Starting Cap:	>300%
Maximum Step-load	50% of Rated Power

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