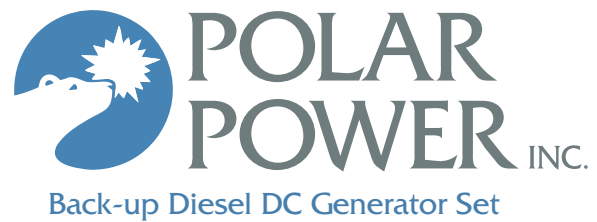


8220-603 series

Reliability through Simplicity



Founded in 1979 Polar Power specialized in solar photovoltaic systems, solar air conditioning and refrigeration. We developed and provided photovoltaic charging controls for telecommunications in the 1980s along with DC generators for the military. In 1994 we were first to provide DC generators with remote control and monitoring to the telecommunications industry.

Polar's success is based on engineering generators to meet the very specific needs of each application. Telecom site optimization is best met with the DC generator technology as the loads and batteries are DC. It makes no sense to install an AC generator and convert the output to DC. The AC generators are designed for a wide range of applications and they are not specifically produced for telecom applications so there are issues with reliability, space, and fuel efficiency.

Polar can save you considerable time and cost in permitting, installing, purchasing, and maintaining a backup generator. We reduce CAPEX and OPEX costs while improving backup reliability.

Intertek 4003706

Conforms to UL STD 2200

Certified to CSA STD C22.2 No. 100

Fuel tank is UL 142 Listed

Meets EPA Emission Regulations
CA/MA Emissions Compliant

2 year standard warranty, extended 5-10 year warranty available

Available Models:

- **8220-603-D-10** Diesel 10 kW, -48 VDC
- **8220-603-D-15** Diesel 15 kW -48 VDC



The concepts and features behind Polar's backup generator for telecommunications include:

SMALL FOOTPRINT. Polar's DC generator is considerably smaller in size than an AC generator. You can now backup sites that could not accommodate an AC generator. Smaller also means less cost for space leasing.

LONG RESERVE. 48 to 72 hour reserve. Polar's DC generator can provide long reserve times because of very low fuel consumption. This generator should be the first choice for sites exposed to natural disasters requiring backup for weeks or months at a time (fuel consumption 1.02 gallon per hour).

LOW ACOUSTIC NOISE. <66 dBA @ 7 meters, and low vibration so as not to disturb the local residents or building landlords. Quieter than other generators with lower noise ratings.

LIGHTWEIGHT. Up to 1/3 the weight of a comparable AC generator. Facilitates roof top installations.

CORROSION RESISTANT. All-aluminum enclosure with stainless hardware for low maintenance, and long service life.

RODENT RESISTANT. Small animals can quickly destroy a generator set by gnawing on wires, fuel lines, radiator hoses, etc. Cooling air inlets and outlets have perforated aluminum screens to keep small rodents and large insects out. Stainless steel wire braid is placed over fuel and radiator lines for increased reliability and safety.

SUPERCAPACITOR STARTER. Failure to start is the number one problem plaguing generator reliability. Polar's unique design has replaced the starting battery with a Super Capacitor. Capacitors are more reliable and last longer than batteries (10-15 year life).

LONG LIFE. Controls and wire harnesses are designed to exceed a 20 year life. Higher grade, longer life electrical wire (UL 3173), weather tight connectors, gold plated connector pins on signal circuits. Controls and wire harness are easily replaceable.

ADVANCED MONITORING. Remote diagnostics, control, and monitoring. Ethernet and RS232 standard, with optional SNMP.

SIMPLICITY. Transfer switch, rectifier, and starting battery are not required.

COMPARING THE COST OF AC vs DC

	AC	DC
Transfer switch required	Yes	No
Permitting costs	\$\$	\$
Shipping to site and installation cost	\$\$	\$
Site preparation/reinforcing structures	\$\$\$	\$
Ethernet/RS232 remote control and monitoring	Extra	Standard

8220 ALTERNATOR FEATURES

- No mechanical adjustments
- Very lightweight
- High quality electrical output
- Voltage and current regulation
- Up to 94% efficiency
- Class 220° C insulation
- Anodized type III process for aluminum parts
- Nickel plating for steel parts
- Stator is varnished

8220 ALTERNATOR SPECIFICATIONS

Type	Permanent Magnets, NdFeB
Weight (lb/kg)	46.5/21
Regulation Type	Variable engine speed
Stator	3 phase/32 poles
Overcurrent Protection (A)	10 kW - 250 15 kW - 350
Disconnect Means	Pull fuse block, sized for each generator kW
Voltage Range (VDC)	44 to 62
Alternator Exhaust Flow (cfm/cmm)	130 to 180 / 3.68 to 5.1
MTBF (hr)	100,000+

ENCLOSURE

Model	88-25-0603
Type	Weather Protective
Materials	Marine Grade Aluminum
Door Hardware	Three Point with Padlock Hasp, and Removable Side Panels
Mounting	Secure Mounting Tabs

WEIGHTS AND DIMENSIONS

	10 kW	15 kW
Dry Weight (lb/kg)	1106/502	1248/566
Dimensions (LxWxH) (in/cm)	32 x 50 x 72 / 81.3 x 127 x 183	

PERMITTING IS FACILITATED

- Small engine horsepower
- Small 54 gallon diesel fuel tank meets UL 142
- DC generator is fully isolated from the utility grid
- No transfer switch
- Low acoustic noise
- Incorporates all requirements made by local Fire Marshals

STARTER SUPERCAPACITOR SPECIFICATIONS

Model	20-16-0001
Storage Rating (Farads)	500
Voltage (VDC)	13-14.4
Weight (lb/kg)	12.1/5.5
Operating Temperature (°C/°F)	-40 to 65 / -40 to 149
Service Life (year)	10 to 15

CHARGER SPECIFICATIONS

Model	00-10-0015
Input Voltage (VDC)	28.8 to 60
Output Voltage (VDC)	14 to 14.4
Recharge time from 0 VDC (min)	10
Recharge time from 8 VDC (min)	2
Weight (lb/kg)	2.2/1

SOUND EMISSIONS

Contact us for current sound data.

ENGINE SPECIFICATIONS: 10 KW DIESEL

Engine Model	Isuzu 3CA1 or Yanmar 3TNV74
Cylinders	3 In-line
Displacement (L)	0.993
Bore (in./mm)	2.91/74
Stroke (in./mm)	3.03/77
Intake Air System	Naturally Aspirated
Engine HP	18
Emissions Compliance	EPA and CARB Certified
Variable RPM	2300 to 2600

ENGINE SPECIFICATIONS: 15 KW DIESEL

Engine Model	Yanmar 3TNV88
Cylinders	3 In-line
Displacement (L)	1.642
Bore (in./mm)	3.4/88
Stroke (in./mm)	3.5/90
Intake Air System	Naturally Aspirated
Engine HP	24
Emissions Compliance	EPA and CARB Certified
Variable RPM	1500 to 1850

ENVIRONMENTAL

Operating Temperature (°C/°F)	-40 to 72 / -40 to 162
Operating Humidity %	100
Cold Start Aids	Glow Plugs

ENGINE FUEL CONSUMPTION

	Output (kW)	gal/hr	L/hr
3CA1/3TNV74	4	0.35	1.32
	5	0.44	1.66
	6	0.53	2
	7	0.615	2.33
	8	0.7	2.65
	9	0.79	2.99
	10	0.88	3.33
3TNV88	15	1.02	3.86

POWER ADJUSTMENT FOR AMBIENT CONDITIONS

Temperature Deration	1% derate for every 5.6 °C (10 °F) above 25 °C (77 °F)
Altitude Deration	3% derate for every 300 m (1000 ft) above 91 m (300 ft)

ENGINE LUBRICATION SYSTEM

Oil Filter Type	Full flow spin-on canister
Oil Capacity	2.8 L - 3CA1/3TNV74 6.7 L - 3TNV88
Oil Pressure Switch	Yes
Oil Pressure Transducer	Optional

ENGINE COOLING SYSTEM

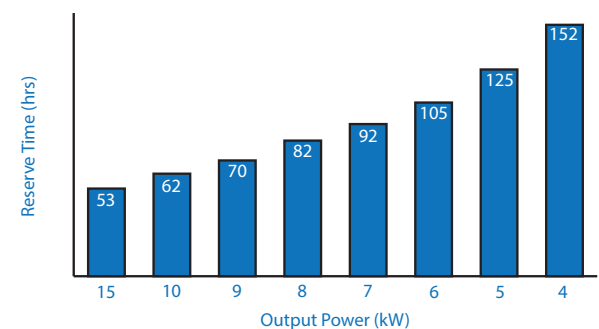
Type	Pressurized Aluminum Radiator
Water Pump	Belt-driven, Pre-lubed, self-sealing
Fan Type	Electric Fans
Airflow CFM or M³/hr	1300 or 2200
Fan Mode	Pusher
Temperature Switch	Yes

DIESEL FUEL SYSTEM

Type	Diesel
Fuel Pump Type	Electrical
Injector Type	Mechanical
Fuel Filtering	Paper element

FUEL TANK SPECIFICATIONS

UL Rated Capacity (gal/L)	54/204
Run Time	see table below
Tank Alarms	Yes
Visual Gages	Yes
Catch Basin (gal/L)	5/19
Listings	UL 142 (double wall)



ENGINE COOLING

	10 kW	15 kW
System coolant capacity (gal/L)	2.2/8.3	
Maximum operation air temperature on radiator (°C/°F)	50/122	57/135
Maximum ambient temperature (°C/°F)	60/140	60/140

COMBUSTION REQUIREMENTS

	10 kW	15 kW
Flow at rated power (cfm/cmm)	47/1.34	68/1.92

EXHAUST

	10 kW	15 kW
Exhaust flow at rated output (cfm/cmm)	90/2.55	135/3.82
Exhaust temperature at rated output (°C/°F)	480/900	

CONTROLLER FEATURES

Controller Type.....	Supra Model 250
4-Line Plain Text LCD Display.....	Simple user interface for ease of operation
Engine Run Hours Indication.....	Standard
Programmable Start Delay.....	Standard
Run/Alarm/Maintenance Logs.....	Standard
Engine Start Sequence.....	Cyclic cranking: 5 sec on, 45 sec rest (3 attempts maximum)
Starter Supercapacitor Charger.....	Standard
Automatic Voltage Regulation with Over and Under Voltage Protection.....	Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown.....	Standard
Overcrank/Overspeed.....	Standard
Automatic High Engine Temperature Shutdown.....	Standard
Field Upgradeable Firmware.....	Standard
Glow Plug Delay	Automatic With Temperature
Engine Start Delay.....	Adjustable, Set at 60 sec
Return to Utility Delay.....	Adjustable, Set at 60 sec
Engine Cool-down.....	Adjustable, Set at 60 sec
Exerciser.....	Programmable, weekly/bi-weekly

WARNING ALARMS

Low Diesel Fuel Level.....	Standard
Diesel Fuel Tank Rapture Basin.....	Standard
Low/High Supercapacitor Voltage.....	Standard
High Water Temperature.....	Standard
Low Oil Pressure.....	Standard

CONTACT CLOSURE FOR REMOTE INDICATION (PN 84-12-0640)

Shutdown Alarm.....	Optional
Warning Alarm.....	Optional
Engine Run.....	Optional
Low Diesel Fuel Level.....	Optional
Diesel Fuel Leak.....	Optional
E-Stop Depressed.....	Optional
Fuel Level Over 90%.....	Optional



