

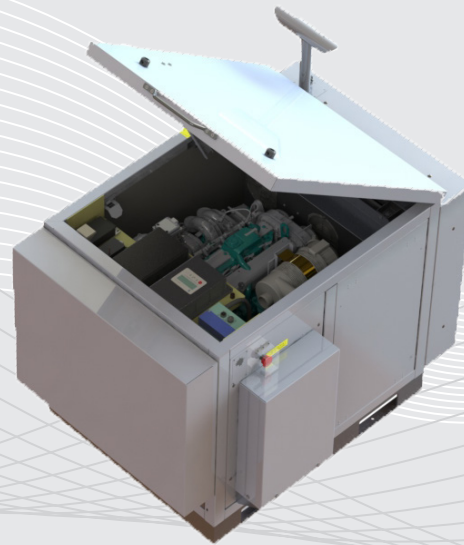
12 KW DIESEL DC GENERATOR PART NUMBER 8220-104-D-12-04

All APUs include:

- Powder coated aluminum enclosure
- V-belt driven radiator fan
- 2 Year Warranty
- Supercapacitor Starter

Options available:

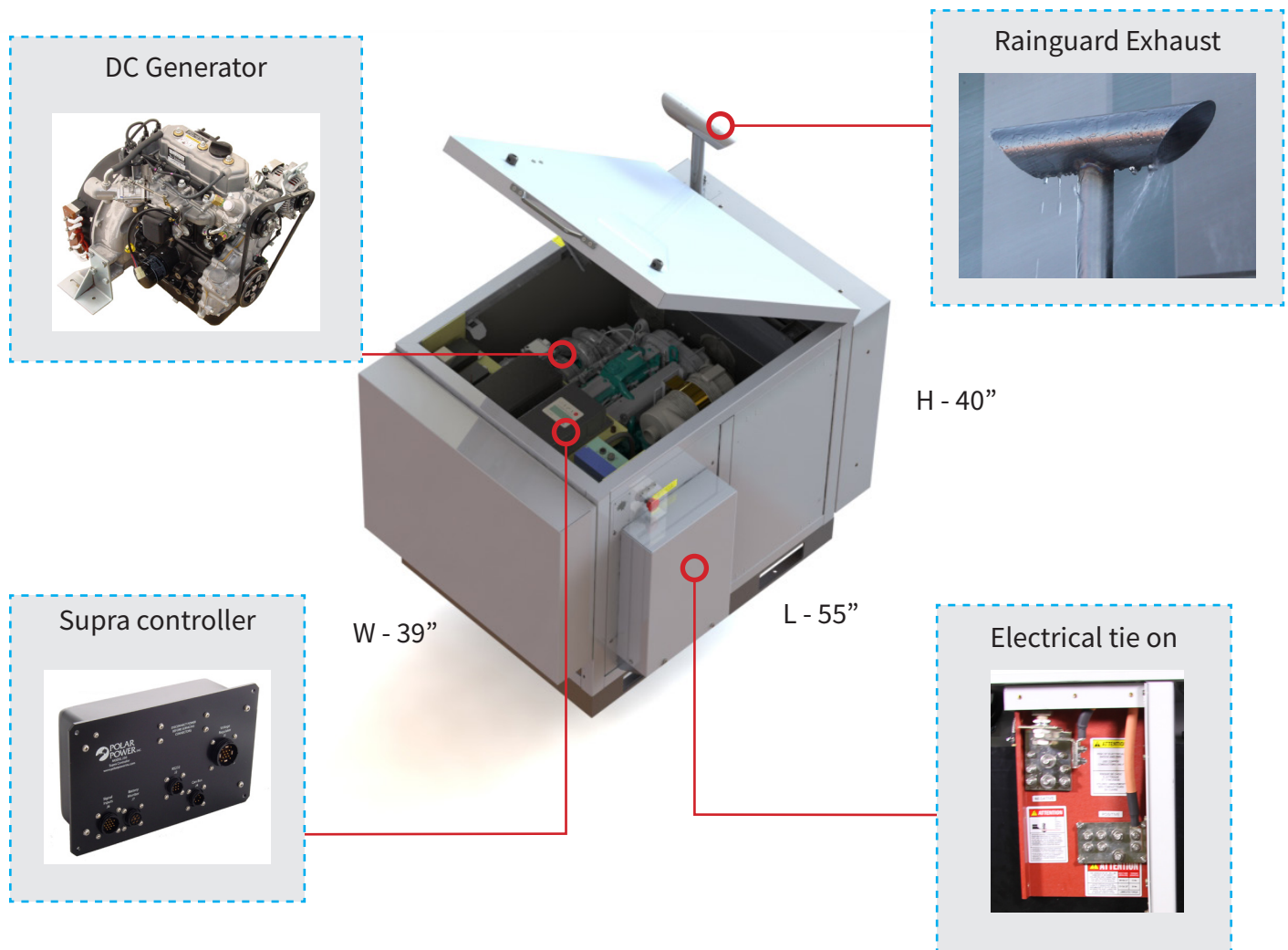
- Electric radiator fans
- Ethernet module with SNMP
- 8-alarm relay board
- Level 2 sound enclosure
- Oil refining kit



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.



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.

LOW MAINTENANCE.

LOW ACOUSTIC NOISE. <66 dBA @ 7 meters for diesel, and low vibration so as not to disturb the local residents or building landlords.

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

FUEL EFFICIENT. Up to 85% fuel savings due to smaller engine displacement, high efficiency alternator, and variable speed operation.

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

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 to prevent damage.

SUPERCAPACITOR STARTER. Failure to start is the number one problem plaguing generator reliability and typically this is caused by a bad starting battery. Polar 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. No transfer switches are required.

SPECIFICATIONS PN 8220-104-D-12-04

Engine

Engine Model	Perkins 403F-11
Cylinders	3 In-line
Displacement (L)	1.1
Bore (in./mm)	3/77
Stroke (in./mm)	3.2/81
Intake Air System	Naturally Aspirated
Engine HP	18
Emissions	U.S. EPA Tier 4 Interim
Emissions Compliance	EPA and CARB Certified
Variable RPM	2300 to 2800

Engine lubrication system

Oil Filter Type	Full flow spin-on canister
Oil Capacity (L)	4.4 L
Oil Pressure Switch	Yes
Oil Pressure Transducer	Optional

Fuel Tank Reserve Time

Load (kW)	Reserve Time (hrs.)
3	99
6	72
9	56
10	55
11	48
12	46
13	44
14	40
15	38

Engine cooling system

Type	Pressurized Aluminum Radiator
Water Pump	Belt-driven, Pre-lubed, self-sealing
Fan Type	Belt-driven
Airflow CFM	1300
Fan Mode	Pusher
Temperature Sensor	Yes

Environmental

Operating Temperature (°C/°F)	-23 to 50 / -10 to 122
Operating Humidity %	100
Cold Start Aids	Spark Plugs

Optional: manifold heater available for temperatures < -10 °F

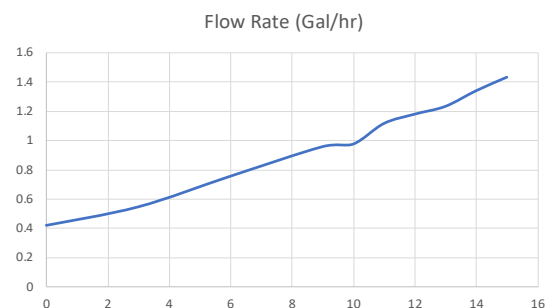
Power adjustment for conditions

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)

Diesel fuel system

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

Diesel fuel consumption



Engine cooling

System coolant capacity (gal/L)	2.2/8.3
Maximum operation air temperature on radiator (°C/°F)	50/122
Maximum ambient temperature (°C/°F)	50/122

Exhaust

Exhaust flow at rated output (cfm/cmm)	110/3.11
Exhaust temperature at rated output (°C/°F)	400/752

Alternator

Alternator Model	8220
Type	Permanent Magnets, NdFeB
Weight (lb/kg)	46.5/21
Regulation Type	Variable engine speed
Stator	3 phase/32 poles
Overcurrent Protection (A)	15 kW - 500
Disconnect Means	Pull fuse block or Circuit breaker
Voltage Range (VDC)	44 to 62
Alternator Exhaust Flow (cfm/cmm)	130 to 180 / 3.68 to 5.1
MTBF (hr)	100,000+

Starter Supercapacitor

Model	20-16-0001
Storage Rating (Ah)	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

Model	00-10-0015
Input Voltage (VDC)	28 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

Enclosure

Model	88-25-0100
Type	Weather Protective
Materials	Powder coated aluminum
Door Hardware	Three Point with Padlock Hasp, and Removable Side Panels
Mounting	Secure Mounting Tabs
Dims.	L 55" x W 39" x H 40"

Optional: L2 option

Controller features

Controller Type.....	Supra Model 250
4-Line Plain Text OLED 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

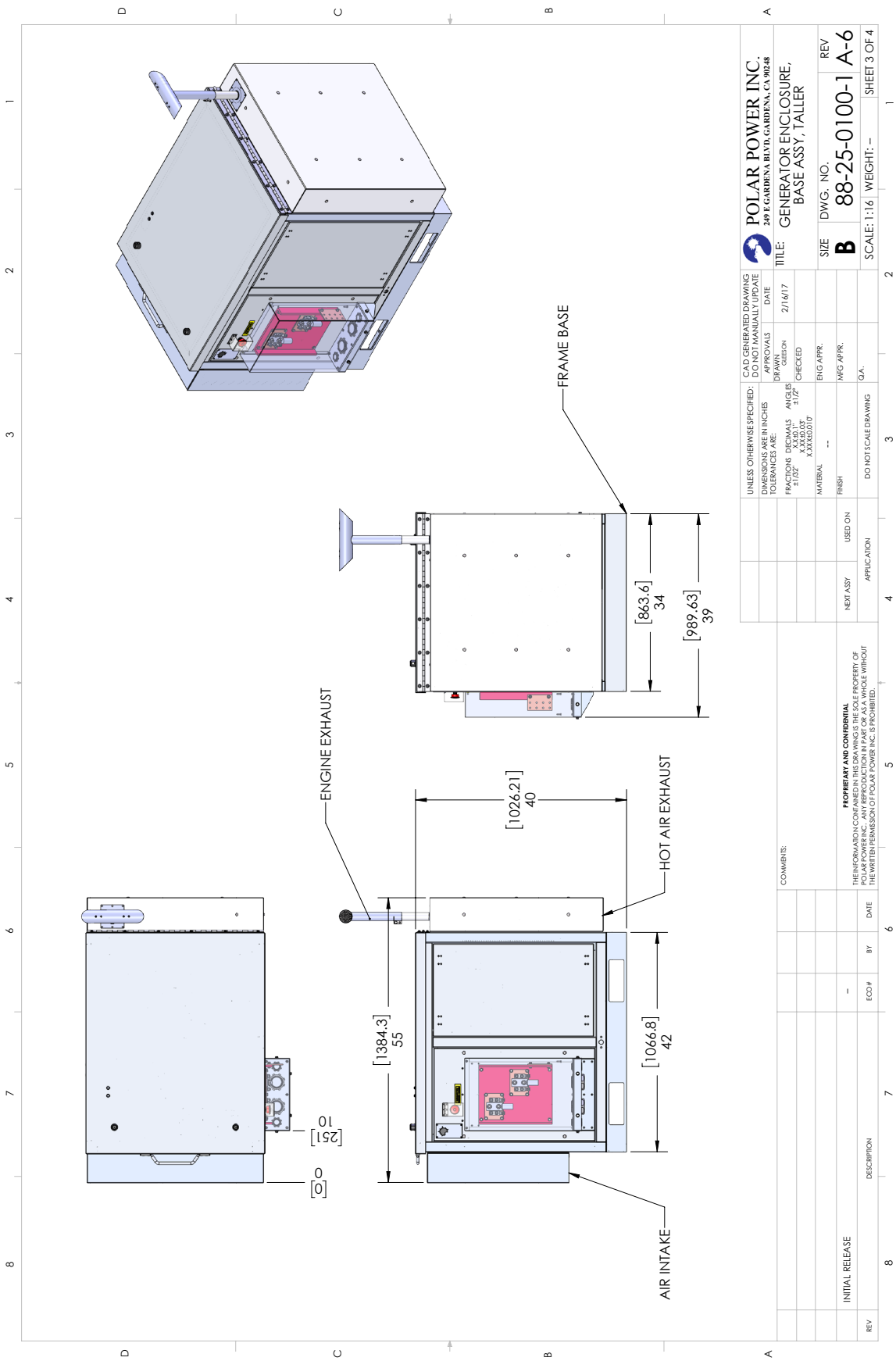
Monitoring

Alarm monitoring and remote control through Ethernet.

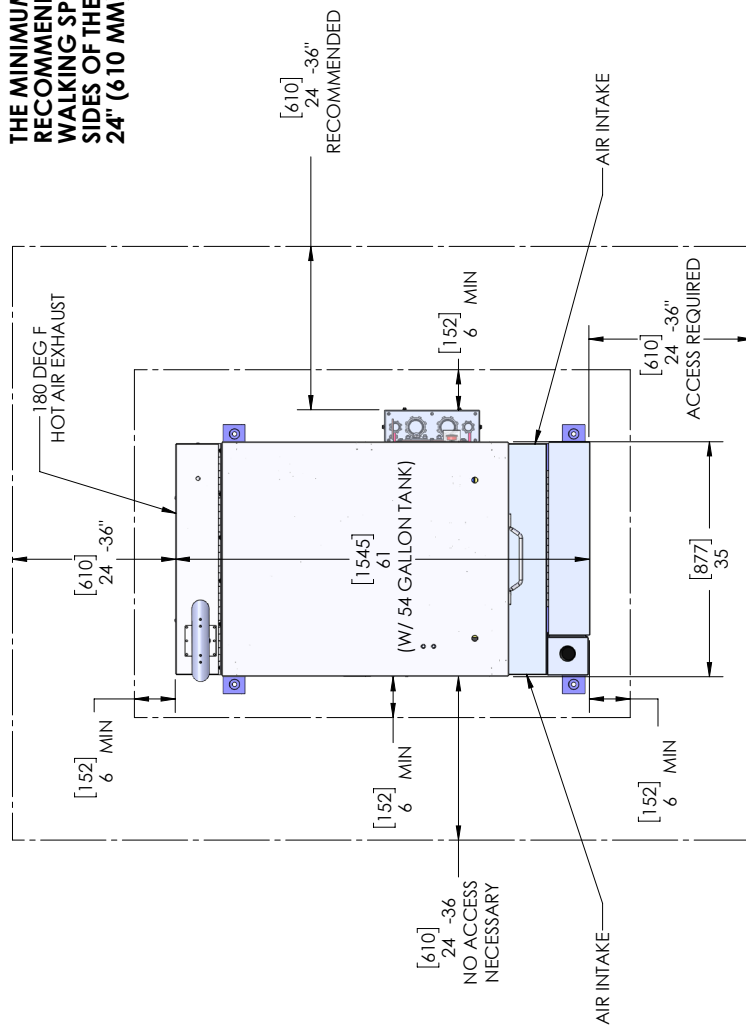
Contact closure alarm board

Shutdown Alarm.....	Standard
Warning Alarm.....	Standard
Engine Run.....	Standard
E-Stop Depressed.....	Standard

DRAWING FOR PN 8340-104-D-12-04



PLAN VIEW SPACE REQUIREMENTS
THE MINIMUM REQUIREMENTS ARE NOT
RECOMMENDED FOR SERVICE CONVENIENCE.
WALKING SPACE IS RECOMMENDED ON ALL
SIDES OF THE GENERATOR.
24" (610 MM) SHOWN

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