

Vertically Polarized, Log Periodic 80° / 17.5 dBi

LPA-185080/12CF ___ 2°

When ordering, replace "___" with connector type.

Mechanical specifications

Length	1806 mm	71.1 in
Width	104 mm	4.1 in
Depth	150 mm	5.9 in
4) Weight	4.8 kg	10.5 lbs
Wind Area		
Front	0.188 m ²	2.02 ft ²
Side	0.271 m ²	2.92 ft ²
Rated Wind Velocity (Safety factor 2.0)		
	>270 km/hr	>168 mph
Wind load @ 100 mph (161 km/hr)		
Front	325 N	73.1 lbs
Side	440 N	98.9 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting & Downtilting:

Wall mounted or pole tower mount with mounting brackets.

Mounting bracket kit #26799997

Downtilt bracket kit #26799999

The downtilt bracket kit includes the mounting bracket kit.

Electrical specifications

Frequency Range	1850-1990 MHz
Impedance	50Ω
3) Connector	NE, E-DIN
1) VSWR	≤1.4:1
Polarization	Vertical
1) Gain	17.5 dBi
2) Power Rating	250 W
1) Half Power Angle	
H-Plane	80°
E-Plane	5°
1) Electrical Downtilt	2°
1) Null Fill	10%
Lightning Protection	Direct Ground

¹⁾ Typical Values

²⁾ Power Rating limited by connector only.

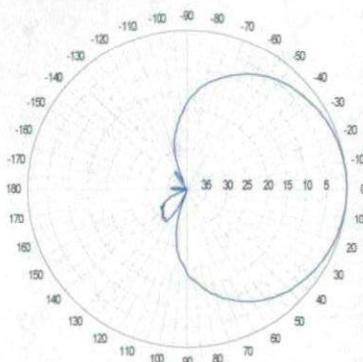
³⁾ NE indicates an elongated N Connector.

E-DIN indicates an elongated DIN Connector.

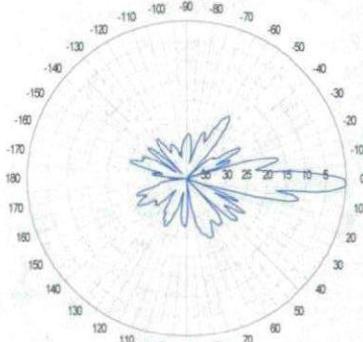
⁴⁾ The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

Radiation-pattern¹⁾



Horizontal



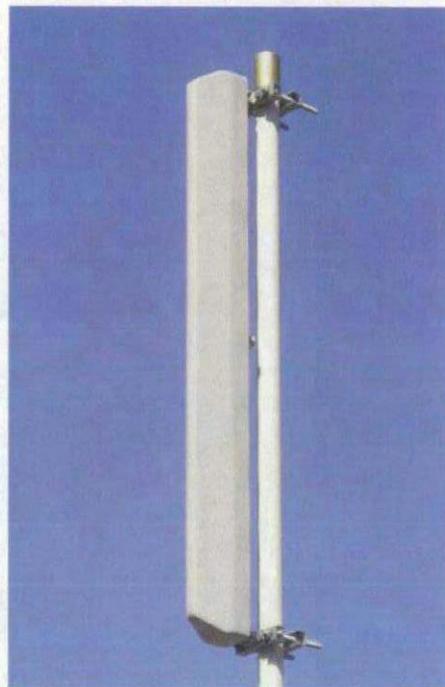
Vertical

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back Ratio.

CF Denotes a Center-Fed Connector.

1850-1990 MHz



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- True log-periodic design allows for superior front-to-side characteristics to minimize sector overlap.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad bandwidth and superior performance.
- Air as insulation for virtually no internal signal loss.

Every Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

Amphenol Antel, Inc.
The Antenna Technology Company

Revision Date: 8/25/05

Flexent® Modular Cell 4.0

Description

The *Flexent®* Modular Cell 4.0 builds on our vast experience in spread spectrum to deliver the most flexible, future-focused base station on the market. This base station introduces the *Flexent® OneBTS™* common platform digital shelf into CDMA networks. This shelf, with a field upgrade, will eventually support both CDMA and UMTS in the frame.

The *Flexent* Modular Cell 4.0 packs 6 carriers/3 sectors into an outdoor cabinet that is the same size as the *Flexent* Modular Cell 3.0. The smaller indoor cabinet will support 4 carriers/3 sectors. In addition to capacity gains, this digital shelf will support additional enhancements as we bring them to market.

Our Bell Labs developers are working on Intelligent Antennas, Transmit Diversity, and BLAST technologies. These technologies will enhance the capacities and capabilities of the *Flexent* Modular Cell 4.0. Each of the features can be added to the *Flexent* Modular Cell 4.0 in the field - in a single maintenance window. This means that you can deploy the *Flexent* Modular Cell 4.0 today and add capacity and capabilities whenever they are available and when you need them. It means that the future is available on your timetable, when your business plan calls for them, no matter what your business plan might be.

Value description

The *Flexent* Modular Cell 4.0, with its future-proof design, enables easy and cost-effective network upgrades to:

- Add additional capacity, when needed, to support network growth
- Support additional functionality and advanced capabilities

Features

Investment Protection

- Increase capacity, when you need it, to grow your network
- Add advanced features and capabilities, with quick and easy installation

Scalability

- Support up to 6 carriers/3 sectors in a single outdoor cabinet
- Support up to 4 carriers/3 sectors in the indoor cabinet

Reduced Footprint

- Provides additional capacity and functionality — in the same footprint as the *Flexent* Modular Cell 3.0

BLAST: Bell Labs Layered Space-Time

*An Architecture for Realizing Very High Data Rates
over Fading Wireless Channels*

What is BLAST?

BLAST is an extraordinarily bandwidth-efficient approach to wireless communication which takes advantage of the spatial dimension by transmitting and detecting a number of independent co-channel data streams using multiple, essentially co-located, antennas.

The central paradigm behind BLAST is the exploitation, rather than the mitigation, of multipath effects in order to achieve very high spectral efficiencies (bits/sec/Hz), significantly higher than are possible when multipath is viewed as an adversary rather than an ally.

Using our laboratory testbed, the BLAST team recently demonstrated what we believe to be **unprecedented wireless spectral efficiencies, ranging from 20 - 40 bps/Hz**. By comparison, the efficiencies achieved using traditional wireless modulation techniques range from around 1 - 5 bps/Hz (mobile cellular) to around 10 - 12 bps/Hz (point-to-point fixed microwave systems). In the 30 kHz bandwidth utilized by our research testbed, the raw spectral efficiencies realized thus far in the lab correspond to payload data rates ranging from roughly 0.5 Mb/s to 1 Mb/s. By contrast, the data rate achievable in this bandwidth using typical traditional methods is only about 50 kbps.

This [high-level overview](#) discusses BLAST in more detail.

[Blast Measurements](#) have been done and reported.

[Blast in the Press](#)

For additional information, contact rav@bell-labs.com.

BLAST-related open literature

- D. Chizhik, G. Foschini, M. Gans, and R. Valenzuela, *Keyholes, Correlations, and Capacities of Multielement Transmit and Receive Antennas*, IEEE Transaction on Wireless Communications. Vol. 1, No. 2, April 2002, pp. 361-368.
- G. J. Foschini, M. J. Gans, *Capacity when Using Multiple Antennas at Transmit and Receive Sites and Rayleigh Faded Matrix Channel is Unknown to the Transmitter*, Advances in Wireless Communications, Ed. J. M Holtzman and M. Zorzi, Kulwer Academic Publishers, 1998.
- G. D. Golden, G. J. Foschini, R. A. Valenzuela, P. W. Wolniansky, *Detection Algorithm and Initial Laboratory Results using the V-BLAST Space-Time Communication Architecture*, Electronics Letters, Vol. 35, No. 1, Jan. 7, 1999, pp. 14-15.
- G. J. Foschini, G.D. Golden, R.A. Valenzuela, P.W. Wolniansky, *Simplified Processing for Wireless Communication at High Spectral Efficiency*, IEEE Journal on Select Areas in Communications, Vol. 17, No.

11, 1999.

- D-S. Shiu, G.J. Foschini, M.J. Gans, J.M.Kahn, Fading Correlation, and its Effect on the Capacity of Multielement Antenna Systems, IEEE Transactions on Communications, Vol. 48, No. 3, 2000.
- P. W. Wolniansky, G. J. Foschini, G. D. Golden, R. A. Valenzuela, *V-BLAST: An Architecture for Realizing Very High Data Rates Over the Rich-Scattering Wireless Channel*, invited paper, Proc. ISSSE-98, Pisa, Italy, Sept. 29, 1998.
[[PostScript \(839 kb\)](#)] [[gzipped PostScript \(71 kb\)](#)] [[PDF \(46 kb\)](#)]
- G. D. Golden, G. J. Foschini, P. W. Wolniansky, R. A. Valenzuela, *V-BLAST: A High Capacity Space-Time Architecture for the Rich-Scattering Wireless Channel*, Proc. Int'l Symposium on Advanced Radio Technologies, Boulder, CO, Sept. 10, 1998.
- G. D. Golden, G. J. Foschini, R. A. Valenzuela, P. W. Wolniansky, *V-BLAST: A High Capacity Space-Time Architecture for the Rich-Scattering Wireless Channel*, Fifth Workshop on Smart Antennas in Wireless Mobile Communications, Stanford Univ., July 23-24, 1998.
- G. J. Foschini and M. J. Gans, *On Limits of Wireless Communications in a Fading Environment When Using Multiple Antennas*, Wireless Personal Communications, Volume 6, No. 3, March 1998, p. 311.
- G. J. Foschini and R. A. Valenzuela, *Initial Estimation of Communications Efficiency of Indoor Wireless Channels*, Wireless Networks, 3 (1997) pp 141-154.
- G. J. Foschini, *Layered Space-Time Architecture for Wireless Communication in a Fading Environment When Using Multiple Antennas*, Bell Labs Technical Journal, Vol. 1, No. 2, Autumn 1996, pp 41-59.
- G. J. Foschini and M. J. Gans, *Capacity When Using Diversity at Transmit and Receive Sites and the Matrix Channel is Unknown at the Transmitter*, Proceedings of the 6-th WINLAB Workshop on 3rd Generation Wireless Information Networks, March 20-21, 1996, New Brunswick, New Jersey.

BLAST- Measurement Literature

- M. Gans et. al., *Multielement Antenna Systems Capacity Measurements at 2.44GHz in Suburban Outdoor Environment*, IEEE Vehicular Technology Conference, Spring 2001.
- J. Ling, et. al., *Multiple Transmit Multiple Receive (MTMR) Capacity Survey in Manhattan*, Electronic Letters, Vol. 37, No. 16, August 2001, pg. 1041.
- D. Chizhik, J. Ling, P. Wolniansky, R. Valenzuela, N. Costa, and K. Huber, *Multiple Input Multiple Output Measurements and Modeling in Manhattan*, Submitted to JSAC Special Issue on MIMO.

haleem@bell-labs.com

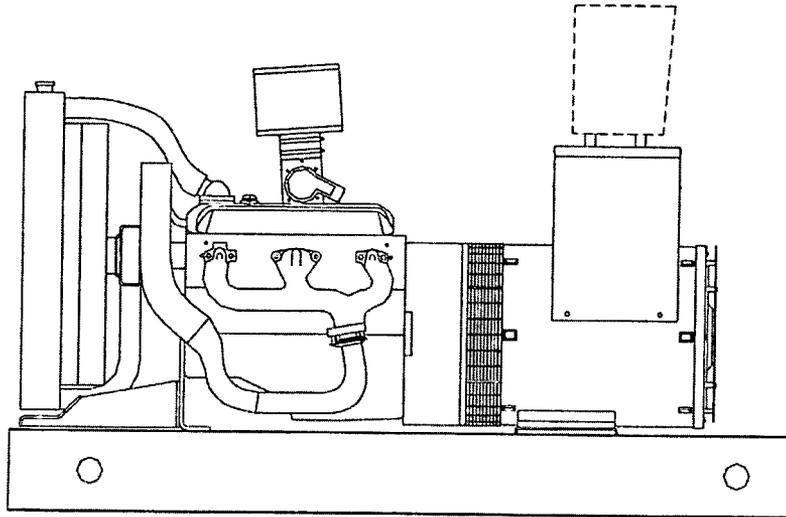
Last updated 6/5/00

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60 kW @ 60 Hz.
Stand-By Power

60F*G4

45 kW @ 60 Hz.
Prime Power



- ▶ Katolight's commitment to quality has been an industry standard since 1952
- ▶ Katolight specializes in custom designing any application to meet the most difficult specifications
- ▶ Each and every unit is factory tested. This can eliminate costly startup and installation delays
- ▶ Katolight supplies a broad range of accessories to match any requirement worldwide
- ▶ Katolight generator sets come standard with a 2 year, 1500 hour limited warranty
- ▶ Optional warranty periods are also available, contact factory for details
- ▶ This model accepts 100% of nameplate rating, per NFPA 110

Model #	Volts	Hz	Phase	Power Factor	Natural Gas Standby Ratings		Natural Gas Prime Ratings		LP Gas Standby Ratings		LP Gas Prime Ratings		Connection
					Amps	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	Amps	kW/kVA	
60FRG4	277/480	60	3	0.8	90	60/75	68	45/56.25	90	60/75	68	45/56.25	12 LEAD HI WYE
60FPG4	120/208	60	3	0.8	208	60/75	156	45/56.25	208	60/75	156	45/56.25	12 LEAD LOW WYE
60FJG4	120/240	60	3	0.8	180	60/75	135	45/56.25	180	60/75	135	45/56.25	12 LEAD HI DELTA
60FNG4	347/600	60	3	0.8	72	60/75	54	45/56.25	72	60/75	54	45/56.25	4 LEAD WYE
60FGG4	120/240	60	1	1.0	250	60/60	188	45/45	250	60/60	188	45/45	12 LEAD ZIG-ZAG
60FDC4	120/240	60	1	1.0	250	60/60	188	45/45	250	60/60	188	45/45	4 LEAD



60F*G4 LPG/NG Gen-Set

STANDARD EQUIPMENT

CONTROL PANEL

- Model #45 control panel
- AC voltmeter, 3 1/2", 2% accuracy
- AC ammeter, 3 1/2", 2% accuracy
- Combination VM/AM selector switch, 4 position
- Frequency meter, 3 1/2", 55-65 Hz.
- Vibration shock mounts (4)
- Engine control - KASSEC-12 VDC, with cyclic cranking timer
- 4 engine shutdowns with separate failure lights
 - * High water temperature
 - * Low oil pressure
 - * Engine overspeed
 - * Engine overcrank
- Engine gauges - 2"
 - * Battery voltmeter
 - * Water temperature
 - * Oil pressure
 - * Running time meter - 5 digits
- 3 position mode switch (auto-off-manual)

ENGINE

- Air cleaner
- Oil pump
- Full flow oil filter
- Jacket water pump
- Thermostat
- Exhaust manifold - dry
- Blower fan & fan drive
- Radiator - unit mounted
- Vibration isolators - pad type
- Electric starting motor - 12V

ENGINE (cont.)

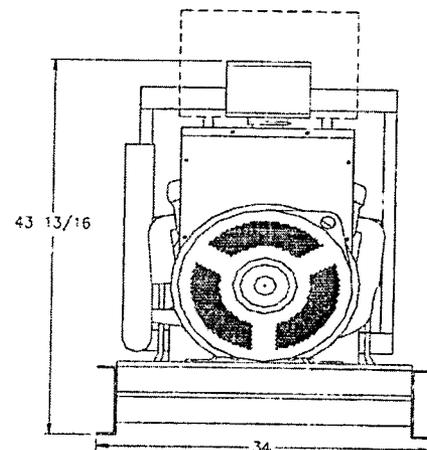
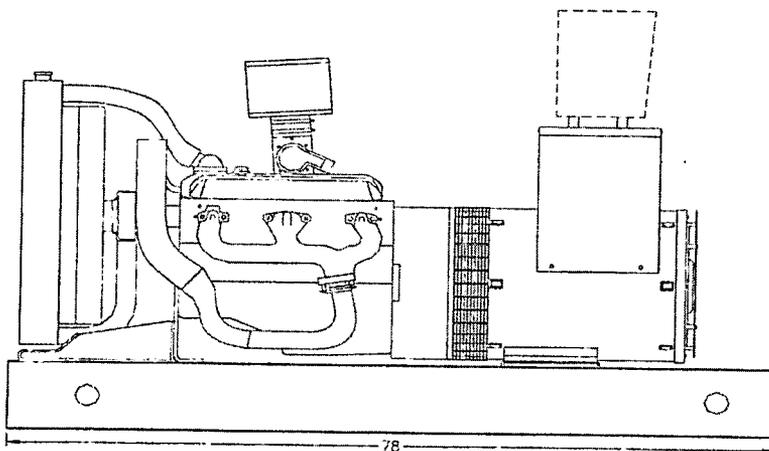
- Governor - Electric Isochronous
- Base - formed steel
- Flywheel & Enclosure
- Charging alternator - 12V
- Battery box & cables
- Flexible fuel & exhaust connectors

GENERATOR

- A.C. Generator
- Brushless design
- Single bearing
- Direct connection with flex plate
- Class H insulation
- All models manufactured to meet NEMA MG1- 22.4 and CSA standards
- Telephone influence factor is well within NEMA standards
- Wave form deviation factor is no more than 5%, well within NEMA standards
- Harmonic content is 3.0% maximum
- Permanently lubricated ball type bearings
- Generator is self-ventilated
- Drip-proof construction

VOLTAGE REGULATOR

- Voltage adjust rheostat
- EMI filter (Internal Electromagnetic Interference)
- Underspeed protection
- Overexcitation protection
- Fully encapsulated
- Regulation - 1%



Drawing above for illustration purposes only, based on standard open power 480 volt generator. Lengths may vary with other voltages.

ENGINE TECHNICAL DATA

	60 Hz	
Model:.....	5.7L	
Type:.....	4-Cycle	
Aspiration:.....	Naturally	
Cylinder Arrangement: (Number, inline, V, etc.).....	8-V	
Displacement - Cu. In. (lit).....	350 (5.7)	
Bore - in. (cm) x stroke - in. (cm).....	4.0 (10.2) x 3.5 (8.8)	
Compression Ratio:.....	9.1:1	
Rated RPM.....	1800	
Rating.....	Standby	Prime
BMEP: psi (kPa).....	110 (758)	107 (737)
Maximum Power at Rated RPM - bhp (kW).....	88 (66)	85 (64)

INSTALLATION DATA *

Exhaust System

Gas Temp. (Stack): °F (°C).....	1,403 (762)	1,306 (708)
Gas Volume at Stack Temp.: CFM (m ³ /min).....	571 (16.2)	532 (15.1)
Maximum Allowable Back Pressure: in. H ₂ O (kPa).....	40.7 (10.1)	40.7 (10.1)

Cooling System

Ambient Capacity of Radiator: °F (°C).....	122 (50)	122 (50)
Maximum Allowable Static Pressure on Rad. Exhaust: in. H ₂ O (kPa).....	1.5 (0.37)	1.5 (0.37)
Water Pump Capacity: gpm (lit/min).....	31 (117)	31 (117)
Heat Rejection to Coolant: BTUM (kW).....	2,999 (52.7)	2,793 (49.1)
Heat Radiated to Ambient: BTUM (kW).....	2,429 (42.7)	2,328 (40.9)

Air Requirements

Aspirating: CFM (m ³ /min).....	180 (5.1)	172 (4.9)
Air Flow Required for Rad. Cooled Unit: CFM (m ³ /min).....	7,115 (201)	7,059 (200)
Air Flow Required for Heat Exchanger/Remote Rad. based on 20°F Rise: CFM (m ³ /min).....	6,747 (191)	6,467 (183)

Fuel Consumption: (NG-1000 BTU/ft³ / LP-2500 BTU/ft³)

	NG	LPG	NG	LPG
At 100% of Power Rating: ft ³ /hr (m ³ /hr).....	748 (21.2)	299 (8.5)	726 (20.6)	291 (8.2)
At 75% of Power Rating: ft ³ /hr (m ³ /hr).....	639 (18.1)	256 (7.2)	615 (17.4)	246 (7.0)
At 50% of Power Rating: ft ³ /hr (m ³ /hr).....	510 (14.4)	204 (5.8)	486 (13.8)	194 (5.5)

Sound Level Data ■

Sound level at:	Full Load	No Load	Full Load	No Load
23 ft (7m) opu w/ critical grade muffler (dBA).....	79	75	78	75
23 ft (7m) Sound Attenuated Enclosure (dBA).....	73	68	72	68

Dimensions & Weight

Length: in. (cm).....	78 (198)
Width: in. (cm).....	34 (86)
Height: in. (cm).....	43.8 (111)
Weight (dry): lb. (kg).....	1,366 (620)

Liquid Capacity

Total oil system: gal (lit).....	1.6 (6.1)
Engine jacket water capacity: gal (lit).....	2.0 (7.6)
System coolant capacity: gal (lit).....	5.3 (20.1)

Fuel Inlet

Fuel connection size:.....	¾" NPT
Fuel supply pressure in H ₂ O (mm H ₂ O).....	7-11 (178-279)

Electrical System

Electric volts DC.....	12
Cold cranking Amps under 0°F (-17.8°C).....	600

Remote Radiator System

Connection sizes:	
Jacket water radiator inlet in. (cm).....	2 (5.1)
Jacket water radiator outlet in. (cm).....	2 (5.1)
Static head allowable	
above engine ft H ₂ O (kPa).....	17 (50.8)
Total system friction pressure	
max. allowable psi (kPa).....	C/F

Heat Exchanger System

Connection sizes:	
Heat ex. inlet in. (cm).....	1.5 (3.8)
Heat ex. outlet in. (cm).....	1.5 (3.8)
Water consumption:	
@ 60°F (16°C) gpm (lit/min).....	7 (26.5)

*Installation data based on 480 volt, 60 HZ. application and open power unit.

■ For sound level readings with other enclosures, please contact factory.

Sound level data acquired per Test Method SAE J1074. Installation factors and site conditions can affect sound levels.

Deration Factor: Altitude: Derate: 3% per 1,000 ft (305 m) above 328 ft (100 m). Temperature: Derate: 1% per 10°F (5.5°C) above 77°F (25°C)

60F*G4 NG Gen-Set**Control Panel**

** NOTE: #45 series control panel is standard on all units, see page 2 of spec sheet for standard features.

- o Model #45 Series Control Panel Options
 - o Emergency stop button
 - o Alarm buzzer with silencing switch
 - o Auxiliary relay for dry contacts (2 max.)
 - o A separate low water level light is optional
 - o Hooded panel lights (2) and on/off switch
 - o NEMA 12 Panel Face
 - o Additional LED lights (4 max.) One or two of the following conditions may be indicated:
 - unit not in auto
 - low fuel level
 - low water level
 - low water temp.
 - EPS supplying load
 - pre-alarm oil
 - pre-alarm temp.
 - charger malfunction
- o Model #50 Series Control Panel
STANDARD FEATURES: same as #45 series control panel except for these added features:
 - o Hooded panel lights (2) and on/off switch
 - o 4 Engine shutdowns
 - o 12 light engine control package meeting NFPA-110 requirement
 - o Repetitive alarm buzzer and silencing switch
 - o Light and alarm press to test#50 SERIES OPTIONS
 - o Emergency stop button
 - o Additional space for one 3 1/2" meter
 - o Auxiliary relay for dry contacts (2 max.)
 - o A separate low water level light is optional
 - o Additional LED lights (4 max.) One to four additional conditions may be indicated: customer to specify
 - o NEMA 12 Panel Face
- o Model #60 and #80 Series Custom Control Panels
It may be necessary to use a 60 or 80 series control panel on certain units where numerous options are required.
- o Microprocessor Control Panel – KDGC

GEN-SET OPTIONS**Cooling System**

- o Remote Radiator
- o High Ambient Radiator
- o Heat Exchanger Cooling
- o Radiator Duct Flange

DISTRIBUTED BY:

Fuel System

- o Fuel Strainer
- o Dual Fuel
 - o Manual Change-over
 - o Auto Change-over

Exhaust System

- o Residential Grade Muffler
- o Critical Grade Muffler
- o Hospital Grade Muffler
- o Rain Cap

Engine Electrical System

- o Battery
 - o Lead-Acid
 - o NiCad
- o Battery Warmer Plate
- o Battery Rack
- o Battery Charger
 - o Automatic
 - o Trickle
 - o Mounted & Wired

Generator

- o Main Line Circuit Breaker
 - o Shunt trip
 - o Auxiliary switch
- o PMG Excitation & DVR 2000 Regulator
- o Space Heaters 120/240 volt
- o Special Testing
- o Additional Temperature Rise Generators
Available (80°C, 105°C, & 130°C)

Additional Optional Equipment

- o Spring vibration isolators
- o Oil Drain Extension
- o Enclosures
 - o Sound Attenuated
 - o Weather Proof
 - o Aluminum
 - o Interior lights AC or DC
 - o Floor Plate
- o Jacket Water Heater
- o Crankcase Oil Heater
- o Remote Annunciator
- o 12 Light Annunciator
 - o Flush Mounted
 - o Surface Mounted
 - o 4 additional lights, if needed
- o Export Boxing
- o Warranties
 - o 2 Year
 - o 5 Year
- o Operating instructions under plexi-glass
- o Service indicator light
- o Wind rated enclosure