

# GNT SERIES

## GNT 475 & 475



# GENPOWER<sup>®</sup>

GENERATOR

231/400V - 50Hz & 277/480V - 60Hz

### Features and Benefits

- Half Century Experience in Generator Manufacturing
- Diesel Engines with Advanced Technology and Quality
- Alternators with Advanced Technology and Quality
- Control Panel Suitable for Flexible Application
- High Quality and Reliable Technology
- Patented Compact Designed and Soundproof Canopy
- Suitable for Heavy-Duty
- Durability
- Wide Range of Affordable Spare Parts
- Low Noise Level
- Low Exhaust Emission
- Low Operating Cost
- Low Fuel Consumption
- Low Oil Consumption
- Tropical 50°C Radiator
- Fuel Filter with Water and Particle Separator
- First Class Product Support
- Global Technical Service and Maintenance Support

### Generator General Information

Generator	Frequency	Voltage	Power Factor	Speed	Diesel Engine			Alternator			Type of	Generator Output							
Model	Hz	V	CosQ	rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	A					
GNT 475	50	231/400	0,8	1500	I N T E R	E587TDI	GII	G E N P O W E R	G N P	315MX	Stand By	475,0	380,0	686,4					
											Prime	431,8	345,5	624,0					
											Continuous	302,3	241,8	436,8					
GNT 475	60	277/480	0,8	1800											315S	Stand By	475,0	380,0	686,4
																Prime	431,8	345,5	624,0
																Continuous	302,3	241,8	436,8

## INTER Diesel Engine Technical Parameters and Matching Parameters

### Diesel Engine Main Technical Parameters

#### General

Number of Cylinders		6
Configuration		Vertical, In Line
Aspiration		Turbocharged & Intercooled
Combustion System		Direct Injection
Compression Ratio		17:1
Bore	mm	126
Stroke	mm	155
Displacement	L	11,596
Governing Type		Electronic
Governing Class		G3
Rotation		Counterclockwise
Firing Order		1-5-3-6-2-4
Emission		Tier II

#### Moments of Rotation Inertia

Engine	kg • m <sup>2</sup>	3,02
Flywheel	kg • m <sup>2</sup>	2,35

#### Performance Rating

Speed Droop	%	≤0,5
Steady State Speed Band	%	≤0,5

#### Test Conditions

Ambient Temperature	%	25
Atmospheric Pressure	kPa	100
Relative Humidity	RH (%)	30
Max. Operating Intake Resistance	kPa	<5
Exhaust Backpressure Limit	kPa	<10
Fuel Temperature (Fuel Inlet Pump)	°C	38 ± 2

#### Filters

Air Filter		Dry Type, Replaceable
Fuel Filter		With Water Separator
Oil Filter		Element Type, Particulate Trap

#### Flywheel Housing and Flex Coupling

Flywheel Housing	SAE (J620)	1
Flex Coupling Disc	Inch (")	14

#### Overall Dimensions

Length *	mm	1884
Width	mm	1006
Height	mm	1323
Dry Weight	Kg	1212

\* From front end of radiator to rear end of air filter

#### Cooling System

Radiator Type	50°C	Tropical
Total Coolant Capacity	L	55
Max. Perm. Coolant Outlet Temperature	°C	103
Max. Perm. Flow Resis. (Cool. System And Piping)	bar	0,5
Max. Temperature of Coolant Warning	°C	95
Max. Temperature of Coolant Shutdown	°C	98
Thermostat Operation Temperature - Initial Open	°C	68
Thermostat Operation Temperature - Full Open	°C	71
Delivery of Coolant Pump	m <sup>3</sup> / h	5,60
Min. Pressure Before Coolant Pump	bar	0,5
Radiator Face Area	m <sup>2</sup>	0,94
Rows	Row	5
Matrix Density	Per / Inch	15,5
Material		Aluminum
Width of Matrix	mm	1100
Height of Matrix	mm	1000
Pressure Cap Setting	kPa	90
Estimated Cooling Air Flow Reserve	kPa	0,125
Engine Pre Heater Tube (with Circulation Pump)	W	3000

#### Lubrication System

Total System	L	26
Minimum Oil Level	L	24
Nominal Motor Operating Temperature	°C	40
Lubricating Oil Pressure (Rated Speed)	bar	5
Relief Valve Opens	kPa	300-400
Oil / Fuel Consumption Ratio	%	≤0,36
Normal Oil Temperature	°C	105

#### Electrical System

Voltage	V	24
Starter	kW	8,5
Alternator Output Ampers	A	55
Alternator Output Voltage	V	28
Batteries Capacity	Ah	2X135

#### Fan

Diameter	mm	840
Drive Ratio		1,2:1
Number of Blades		6
Material		Metal
Type		Blowing

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### Diesel Engine Matching Parameters

#### 50 Hz @ 1500 r/min

		Stand By	Prime
Gross Engine Power	kW	426,0	389,0
Net Engine Power	kW	404,0	368,0
Fan Power Consumption (Belt Pulley Driven)	kW	20,0	20,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	2,94	2,68
Intake Air Flow	m <sup>3</sup> / min	26,25	25,00
Exhaust Temperature Limit	°C	650	650
Exhaust Flow	m <sup>3</sup> / min	50,75	48,33
Boost Pressure Ratio		3,26	3,09
Mean Piston Speed	m / s	7,8	7,8
Cooling Fan Air Flow	m <sup>3</sup> / min	650,0	650,0
Typical Generator Output Power	kVA	475	432

#### Heat Rejection

Energy in Fuel (Heat of Combustion)	kW	1065,0	973,0
Gross Heat to Power	kW	426,0	389,0
Energy to Coolant and Lubricating Oil	kW	213,0	195,0
Heat Dissipation Capacity*	kW	75,0	68,0
Energy to Exhaust	kW	309,0	282,0
Heat to Radiation	kW	43,0	39,0

\*Intake Intercooled System

#### 60 Hz @ 1800 r/min

		Stand By	Prime
Gross Engine Power	kW	426,0	389,0
Net Engine Power	kW	400,0	363,5
Fan Power Consumption (Belt Pulley Driven)	kW	24,0	24,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	2,45	2,24
Intake Air Flow	m <sup>3</sup> / min	26,25	25,00
Exhaust Temperature Limit	°C	650	650
Exhaust Flow	m <sup>3</sup> / min	50,75	48,33
Boost Pressure Ratio		3,20	3,10
Mean Piston Speed	m / s	9,3	9,3
Cooling Fan Air Flow	m <sup>3</sup> / min	650,0	650,0
Typical Generator Output Power	kVA	470	427

#### Heat Rejection

Energy in Fuel (Heat of Combustion)	kW	1067,0	951,0
Gross Heat to Power	kW	426,0	366,0
Energy to Coolant and Lubricating Oil	kW	213,0	195,0
Heat Dissipation Capacity*	kW	74,0	68,0
Energy to Exhaust	kW	309,0	282,0
Heat to Radiation	kW	45,0	41,0

\*Intake Intercooled System

## GENPOWER Alternator Technical Parameters and Specifications

### Alternator Technical Parameters

Insulation Class		H	Field Control System		Self Excited
Winding Pitch		2/3 - (N° 6)	A.V.R. Model	Standard	SX440
Wires		12	Voltage Regulation	%	± 1
Protection		IP 23	Sustained Short-Circuit Current	10 sec	300% (3 IN)
Altitude	m	1000	Total Harmonic (*) TGH / THC	%	< 4
Overspeed	rpm	2250	Wave Form :NEMA = TIF - (*)		< 50
Air Flow	m³/sec	0.8	Wave Form :I.E.C. = THF - (*)	%	< 2
Bearing Drive	N/A	-	Bearing Non - Drive	Bearing	6314-2RZ
Rotor Winding	100%	Copper	Stator Winding	100%	Copper

(\*) Total harmonic content line to line, at no load or full rated linear and balanced load

Genpower synchron alternators are produced according to TSE 60034-1; IEC 60034-22; GB755; BS4999-5000; NEMA MG 1.22 standards

### Alternator Specifications

50 Hz - 231/400V - Cos Q 0,8 - 1500 rpm									
Standard Using Alternator				Optional Using Alternator					
Brand/Model	Genpower	315MX		Leroy Somer	TAL047B		Stamford	S4L1DG	
Duty		Continuous				Stand By			
Ambient	C°	40°C				27°C			
Class/Temp. Rise	C°	H / 125° K				H / 163° K			
Series Star (V)	V	380/220	400/231	415/240	1 Phase	380/220	400/231	415/240	1 Phase
Parallel Star (V)	V	190/110	200/115	208/120	220	190/110	200/115	208/120	220
Series Delta (V)	V	220	230	240	230	220	230	240	230
Output Power	kVA	432,0	432,0	448,0	-	475,0	475,0	493,0	-
Output Power	kW	345,6	345,6	358,4	-	380,0	380,0	394,4	-

60 Hz - 277/480V - Cos Q 0,8 - 1800 rpm									
Standard Using Alternator				Optional Using Alternator					
Brand/Model	Genpower	315S		Leroy Somer	TAL046H		Stamford	HC4E	
Duty		Continuous				Stand By			
Ambient	C°	40°C				27°C			
Class/Temp. Rise	C°	H / 125° K				H / 163° K			
Series Star (V)	V	416/240	440/254	480/277	1 Phase	416/240	440/254	480/277	1 Phase
Parallel Star (V)	V	208/120	220/127	240/138	-	208/120	220/127	240/138	-
Series Delta (V)	V	240	254	277	240	240	254	277	240
Output Power	kVA	421,0	443,0	466,0	-	463,0	487,0	513,0	-
Output Power	kW	336,8	354,4	372,8	-	370,4	389,6	410,4	-

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### Control Panel Specifications

Powder Painted Steel Pannel with Lockable Door  
ATS (Automatic Transfer Panel) - Optional  
Control Module

Battery Charger  
Emergency Stop Button  
Backlit, 128x64 Pixels

Control Relays  
Terminal Blocks  
Load Output Terminal

System Protection MCBs  
Circuit Breaker - Optional  
LCD Screen

### Control Module Technical Parameters

Brand GENPOWER  
Dimensions 120mm x 94mm  
Weight 260 gr.  
Ambient Humidity 90% max.  
DC Battery Supply Voltage 8 - 32 V  
Network Frequency 5 - 99,9 Hz  
Generator Voltage Measurement 3 - 300 V  
Current Transformer Secondary 5A  
Charge Alternator Voltage Measurement 8 - 32 V  
Communication Interface RS-232  
Generator Contactor Relay Output 5A & 250V  
Solenoid Transistor Outputs 1A with DC Supply  
Configurable-3 Transistor Outputs 1A with DC Supply

Model Trans-MIDIAMF.232.GP  
Protection Class IP65 From the Front  
Environmental Conditions 2000 Meters Above Sea Level  
Ambient Temperature -20 ° C to + 70 ° C  
Battery Voltage Measurement 8 - 32 V  
Mains Voltage Measurement 3 - 300 V Phase-Neutral, 5 - 99.9 Hz  
Generator Frequency 5 - 99.9 Hz  
Working Period Continuous  
Charge Alternator Excitation 210mA & 12V, 105mA & 24V Nominal 2.5W  
Analog Sender Measurement 0 - 1300ohm  
Mains Contactor Relay Output 5A & 250V  
Start Transistor Outputs 1A with DC Supply  
Configurable-4 Transistor Outputs 1A with DC Supply

### Control Module Functions

Mains Voltage Level Control  
Network Frequency Level Control  
Engine Operating Option Control  
Engine Stop Option Control  
Engine Speed (RPM) Level Control  
Battery Voltage Options Control  
Check Engine Maintenance Times  
Communication Interfaces GPRS, GSM  
Engine Speed  
Voltage

Generator Voltage Level Control  
Generator Frequency Level Control  
Generator Current Level Control  
Generator Power Level Control  
Generator Work Schedule and Timing Control  
Oil Pressure Controllers Control  
Configurable Analog Inputs and Outputs  
Keeping Error Records of Past Events  
Configurable Programmable Digital Inputs and Outputs  
Current and Frequency

3 phase Generator Protections  
- High / Low Voltage  
- High / Low Frequency  
- Current / Voltage Asymmetry  
- Overcurrent / Overload  
Overheat Control  
1 Phase or 3 Phase, Phase Selection  
Parameter Setting via Control Module  
Water Temperature  
Phase Sequence

3 phase AMF Function  
- High / Low Frequency  
- High / Low Voltage  
- High / Low Water Temperature  
- High / Low Load  
Mains, Generator ATS control  
Network, Voltage, Frequency Display  
Parameter Setting via Computer  
Hours of Operation  
Earting

Alarm Horn  
Heater Tube Thermostat Control  
Modbus and SNMP  
Working Hour  
Ground Leakage  
Analog Modem  
Ethernet, USB, RS232, RS485  
Selectable Protection Alarm / Shutdown  
Battery Voltage  
Oil Pressure

### Control Module Alerts

Emergency Stop Malfunction  
High Generator Voltage  
Low Generator Frequency  
Low Load  
Over Current  
Unbalanced Current

Low Generator Voltage  
High Generator Frequency  
Phase Sequence Error  
Overload  
Low Water Level (Optional)  
Low Oil Pressure

Low Water Temperature  
Heat Sensor Broken  
Reverse Power  
Start Error  
Stop Error  
Magnetic Pickup Error

Charge Alternator Error  
Unbalanced Load  
Maintenance Time Alarm  
Low Speed  
High Speed  
Broken Oil Sensor Cable

High Oil Temperature (Optional)  
Low Fuel Level (Optional)  
High Battery Voltage  
Low Battery Voltage  
High Water Temperature  
Electronic Canbus Errors (ECU)

### Sound Proof Canopy and Base Frame (Chassis) Specifications

Special, Registered GENPOWER Design and Color  
A1 Quality DKP / HRU /Galvanized Steel  
Sensitive Twist on Automatic Press Brake  
Delicate Cut on Automatic Punch and Laser Bench  
Sensitive Welding on Robotic Welding Bench  
Chemical Cleaning Nano Technology Before Painting

Robotic Painting with Electrostatic Powder Paint  
Drying and Stabilizing on 200°C Ovens  
1500 Hour Salt Test  
Glasswool Isolation, A1 Class Material -50/+500°C  
Special Covering Over Glass Wool  
Best Sound Level (in dBA)

Temperature Tests  
Rustproof Accessories  
Cable Exit Connectors and Glands  
Emergency Stop Button  
Fuel Level Gauge  
Fuel Drain Cap

Fuel Inlet and Return Records  
Impermeability Test for Fuel Tank  
Vacummmed Rubber Mounted  
High Quality Weatherstrips  
High Quality Shock Absorbers  
Fuel Filling Cap (with ventilation)

Lifting and Carrying Equipments  
Internal Exhaust Mufflers (Silencers)  
External Exhaust Mufflers (Silencers)  
Radiator Water Filling Cap  
Daily Fuel Tank  
External Fuel Tank

### Special Products / Non - Standardized

Synchronised Systems  
Scada Systems  
Mobile Systems  
Light Towers  
Ground Power Unit Generators

Generators - with Trailer  
Medium Voltage - MV  
IP44-IP54 Class Generators  
Welding Machines  
Natural Gas Generator

DC Generators  
High Voltage - HV  
Power Plants  
Trigeneration Systems  
Biogas Generator

High Frequency Generators  
Variable Speed Generators  
Super Silent Canopy  
Cogeneration Systems  
LPG Generator

Marine Generators  
Dual Generators  
Automatic Voltage Stabilizers  
Electrical and Diesel Forklift  
HFO Generator

### Quality Documents & Certificates

Trademark Registration Certificate  
Capacity Report (32400 Units / Year)  
Made in Turkey Certificate- For Generator/1-5000 kVA  
Made in Turkey Certificate-For Alternator/1-5000kVA  
Made in Turkey Certificate- For Engine/1-5000 kW  
Certificate of Competency for After Sales Services  
2014/30/EU Electromagnetic Compatibility Directive  
CE Certificate - 2000/14/AT - 2000/14 EC (CE 2195)

Industrial Registry Certificate  
Certificate of Manufacturing Competence  
TSE- Service Adequacy Certificate  
ISO 9001 - 2015 Certificate  
ISO 14001 - 2015 Certificate  
OHSAS 18001 - 2007 Certificate  
2006/42/EC Machinery Directive  
Coatchem- Türkak 1500 Hours Corrosion Durability Test Certificate

TSE 8528 - 4 Certificate  
TSE 8528 - 5 Certificate  
TSE 8528 - 8 Certificate  
AB-0547-T Certificate  
EAC - GOST Certificate/ Diesel Generator  
EAC - GOST Certificate/ Gasoline Generator  
CE Certificate - EN ISO 17050-1,2004

TS EN ISO 2409 Certificate  
TS EN ISO 4628-3 Certificate  
TS EN ISO 4628-4 Certificate  
TS EN ISO 4628-5 Certificate  
TS EN ISO 4628-8 Certificate  
TS EN ISO 9227 Certificate  
TS 9620 EN ISO 4628-2 Certificate  
TS EN 60034 - 1 Certificate

EN ISO 8528-13,2016 Certificate  
EN ISO 12100:2010 Certificate  
EN ISO 13857:2008 Certificate  
EN ISO 14120:2015 Certificate  
EN 349:1993+A1:2008 Certificate  
EN 60204-1,2018 Certificate  
EN 61000-6-2,2019 Certificate  
EN 61000-6-4,2007/A1:2011 Certificate

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G E N E R A T O R

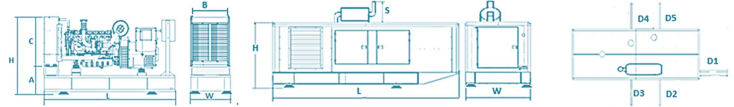
231/400V - 50Hz & 277/480V - 60Hz

### Generator Dimensions

Values		Open Type Generator	Canopy Type Generator
Width	mm	1200	1646
Length	mm	3374	4632
Height	mm	1953	2641
Weight (Net)	Kg	2761	3620
Fuel Tank Capacity	L	673	400

### Generator Technical Drawings

SYMBOL	OPEN	CANOPY
L	3374	4632
W	1200	1646
H	1953	2600
S		641
A	725	
B	540	
C	1000	
D1		1002
D2		800
D3		800
D4		800
D5		800



### Diesel Engine and Genset Rating Classifications

*The below ratings represent the engine performance capabilities to conditions specified in TS ISO 8528/1, 8528-4, 8528-5, 8528-8, BS5000, ISO 3046/1:1986, NEMA MG-1.22.1, BS 5514/1.*

#### STAND BY POWER RATING (ESP):

ESP is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Stand By Power rating. This rating should be applied where reliable utility power is available. A Stand By rated engine should be sized for a maximum of an 70% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Stand By Power rating. Stand By ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency.

#### PRIME POWER RATING (PRP):

Applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

##### UNLIMITED TIME RUNNING PRIME POWER (ULTP):

PRP (Prime Power) is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour within a 12-hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

##### LIMITED TIME RUNNING PRIME POWER (LTP):

LTP (Limited Time Prime Power) is available for a limited number of hours in a nonvariable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation exceeding 750 hours per year at the Prime Power rating should use the Continuous Power rating.

##### CONTINUOUS POWER RATING (COP):

COP is the power that the engine can continue to use under the prescribed speed and the specified environment condition in the normal maintenance period stipulated in the manufacturing plant. And Continuous Power is applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.

### PAY ATTENTION to the points below in picking and using the generator

\* Generators can work on Continuous Power at 70% of Prime power value if only all maintenances are done on time with original spare parts and high quality oils that manufacturer advice.

\* Generators should not operate below 50% of Prime Power value. In such a case, the engine will burn excessive oil and eventually have irreparable damage.

\* If your need is 1000 kVA or above, you should prefer Synchronic Systems with 2-3 generators with failure back up and simultaneous aging.

\* These points will provide advantage for you with purchasing and operating the generator.

### INTER Diesel Engine Power Ratings – Fuel Consumption – Oil Recommendation and Oil Grades

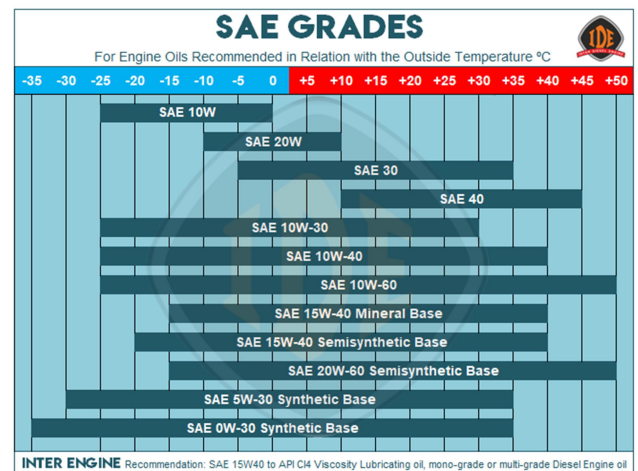
INTER Diesel Engine Power Ratings							
Engine Model	ES87TDI	Engine Family		ID23	Engine Series	GII	
Speed rpm	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	Hp	kWm	Hp
		1500	Stand By (Maximum)	475.0	380.0	426.0	571.8
Prime	432.0		345.0	389.0	522.1	368.0	494.0
1800	Stand By (Maximum)	475.0	380.0	426.0	571.8	404.0	542.3
	Prime	432.0	345.0	389.0	522.1	368.0	494.0

*Generator powers are typical and are based on an average alternator efficiency and a power factor (Cos.  $\phi$ ) of 0.8*

Fuel Consumption				
Percent of Prime power	1500 rpm		1800 rpm	
	g/kWh	l/hr	g/kWh	l/hr
110%	200	95,6	200,0	95,6
100%	198	86,1	198,0	86,1
75%	205	66,9	205,0	66,9
50%	210	45,7	210,0	45,7

*Note: The density of diesel is 0.835 kg/L*

*Fuel specification: BS 2869: Part 2 1998 Class A2 or (DIN EN 590) ASTM D975 D2 Diesel. The fuel must be clean and without water*



### Why You Should Buy GENPOWER?

### Only because it is the biggest generator factory in the World? NO!

- \* It is one of the most trustworthy and distinguished generator manufacturers in the world with its almost half century experience in the field.
- \* It has interiorized the strategy of **unconditional customer satisfaction** and has been working with this work ethic together with its whole crew.
- \* Customers and end users get their moneys' worth and more with every penny.
- \* It has become a big family with customers and users who receive durable, long-lasting and high quality products.
- \* It has been appreciated many times by customers and suppliers about the investments that have been made for quality enhancement.
- \* Both its suppliers and customers always know GENPOWER is and will always be there for them. GENPOWER on their side in bad and good days.
- \* In order not to harm brand reputation and recognition, each day, they work harder than the day before.
- \* It continues its business only with the suppliers, customers, dealers and technical services that also embrace the same mind set and work ethics.
- \* It proves its loyalty for quality and customer satisfaction with its mottoes **"Your power is the core of our business"** and **"nothing will be left unfinished"**
- \* The specifications and/or modifications you can receive with extra costs by other manufacturers are included in standard production in GENPOWER
- \* When you purchase GENPOWER products, you are not a customer or a buyer but GENPOWER perceives and accepts you as a valuable member of its continuously growing family.

### These are why you should buy from GENPOWER...

# GENPOWER<sup>®</sup>

G E N E R A T O R



#### Factory Address

ASO II. Industrial Zone  
2010. Street No: 18  
06909 Temelli-Sincan/Ankara, Turkey  
Tel/ Fax: +90(312) 641 32 22 - 641 32 23  
genpower@genpower.com.tr  
www.genpower.com.tr