

GPR SERIES

GPR 1656



GENPOWER[®]

GENERATOR

231/400V - 50Hz

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	Brand	Model	Series	Operation	kVA	kW	A
GPR 1656	50	231/400	0,8	1500	PERKINS	4012-46TAG2A	GENPOWER	GNP	GNP 400 L2	Stand By Prime Continuous	1.656,0 1.505,5 1.053,8	1.324,8 1.204,4 843,1	2.393,1 2.175,5 1.522,9

PERKINS Diesel Engine Technical Parameters and Matching Parameters

Diesel Engine Main Technical Parameters

General

Number of Cylinders		12
Configuration		Vee 60°
Aspiration		Turbo Charged & Intercooled
Combustion System		Direct injection
Compression Ratio		13:1
Bore	mm	160
Stroke	mm	190
Displacement	L	45,842
Governing Type		Electronic
Governing Class		G3
Rotation		Counterclockwise
Firing Order		1A,6B,5A,2B,3A,4B,6A,1B,2A,5B,4A,3B
Emission		Fuel Optimised

Filters

Air Filter		Dry Type, replaceable
Fuel Filter		Element type, replaceable
Oil Filter		Element type, particulate trap

Electrical System

Voltage	V	24
Starter	kW	2X8,2
Alternator Output Ampers	A	40
Alternator Output Voltage	V	28
Batteries Capacity	Ah	4X200

Fan

Diameter	mm	1600
Drive Ratio		0.93:1
Number of Blades		12
Material		Aluminum
Type		Blowing

Cooling System

Radiator Type	50°C	Tropical
Total Coolant Capacity	L	210
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	71
Thermostat Operation Temperature - Full Open	°C	85
Delivery of Coolant Pump	m ³ /h	17,00
Min. Pressure Before Coolant Pump	bar	0,5
Radiator Face Area	m ²	3,46
Rows	Row	4
Matrix Density	Per / Inch	12
Material		Aluminum
Width of Matrix	mm	2100
Height of Matrix	mm	1650
Pressure Cap Setting	kPa	70
Estimated Cooling Air Flow Reserve	kPa	0,125
Engine Pre Heater Tube (with Circulation Pump)	W	2X3000

Lubrication System

Total System	L	177
Minimum Oil Level	L	136
Nominal Motor Operating Temperature	°C	40
Lubricating Oil Pressure (Rated Speed)	bar	4
Relief Valve Opens	kPa	340
Oil / Fuel Consumption Ratio	%	0,52
Normal Oil Temperature	°C	105

Diesel Engine Matching Parameters

50 Hz @ 1500 r/min

Gross Engine Power	kW	1459,0
Net Engine Power	kW	1395,0
Fan Power Consumption (Belt Pulley Driven)	kW	64,0
Other Power Loss	kW	-
Mean Effective Pressure	MPa	2538,00
Intake Air Flow	m ³ / min	128,00
Exhaust Temperature Limit	°C	455
Exhaust Flow	m ³ / min	320,00
Boost Pressure Ratio		107,00
Mean Piston Speed	m / s	9,5
Cooling Fan Air Flow	m ³ / min	1944,0
Typical Generator Output Power	kVA	1656

Heat Rejection

Energy In Fuel (Heat Of Combustion)	kW	3570,0
Gross Heat To Power	kW	1459,0
Energy To Coolant And Lubricating Oil	kW	501,0
Energy To Exhaust	kW	1080,0
Heat To Radiation	kW	107,0

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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	MX341+PMG
Wires		6	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	1,614	Wave Form :I.E.C. = THF - (*)	%	< 1.5
Bearing Drive	N/A	-	Bearing Non - Drive	Bearing	6317-2RZ
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	GNP400L2		Leroy Somer	LSA 50.2L8		Stamford	P7 C	
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	1500,0	1500,0	1556,0	-	1650,0	1650,0	1712,0	-
Output Power	kW	1200,0	1200,0	1245,0	-	1320,0	1320,0	1370,0	-

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
Dimensions
Weight
Ambient Humidity
DC Battery Supply Voltage
Network Frequency
Generator Voltage Measurement
Current Transformer Secondary
Charge Alternator Voltage Measurement
Communication Interface
Generator Contactor Relay Output
Solenoid Transistor Outputs
Configurable-3 Transistor Outputs

GENPOWER
120mm x 94mm
260 gr.
90% max.
8 - 32 V
5 - 99.9 Hz
3 - 300 V
5A
8 - 32 V
RS-232
5A & 250V
1A with DC Supply
1A with DC Supply

Model
Protection Class
Environmental Conditions
Ambient Temperature
Battery Voltage Measurement
Mains Voltage Measurement
Generator Frequency
Working Period
Charge Alternator Excitation
Analog Sender Measurement
Mains Contactor Relay Output
Start Transistor Outputs
Configurable-4 Transistor Outputs

Trans-MIDIAMF.232.GP
IP65 From the Front
2000 Meters Above Sea Level
-20 ° C to + 70 ° C
8 - 32 V
3 - 300 V Phase-Neutral, 5 - 99.9 Hz
5 - 99.9 Hz
Continuous
210mA & 12V, 105mA & 24V Nominal 2.5W
0 - 1300ohm
5A & 250V
1A with DC Supply
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
Vacuummed 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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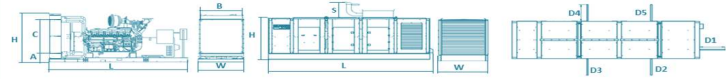
231/400V - 50Hz

Generator Dimensions

Values		Open Type Generator	Canopy Type Generator
Width	mm	1800	2352
Length	mm	5225	7883
Height	mm	2255	2706
Weight (Empty)	Kg	10385	15405
Fuel Tank Capacity	L	2500	2500

Generator Technical Drawings

SYMBOL	OPEN	CANOPY
L	5225	7883
W	1800	2352
H	2255	2706
S	-	700
A	230	-
B	2100	-
C	1650	-
D1	0	1044
D2	0	1044
D3	0	1044
D4	0	1044
D5	0	1044



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.

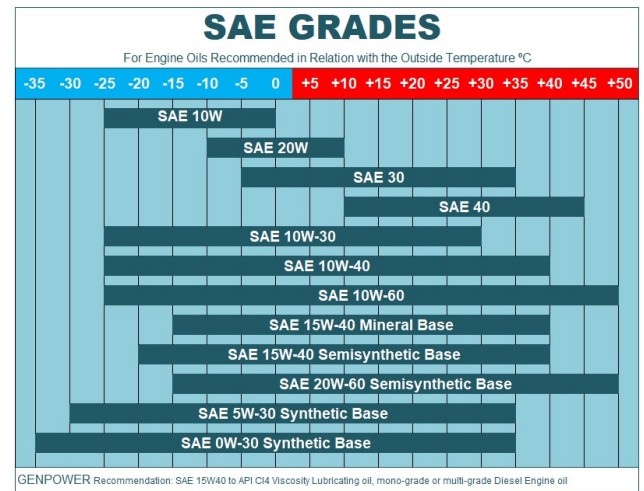
* These points will provide advantage for you with purchasing and operating the generator.

Fuel Consumption - Oil Recommendation and Oil Grades

Fuel Consumption	
Percent of Prime power	l/hr
110%	335,0
100%	301,0
75%	237,0
50%	162,0

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 mottos "**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
GENERATOR



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