

رادوکو نمایندگی دیزل ژنراتور

GENPOWER
GENERATOR

GNT 660 & 660

تلفن: 021-58437
www.Radocorp.com



Features and Benefits 231/400V - 50Hz & 277/480V - 60Hz

- 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 660	50	231/400	0,8	1500	I N T E R	E816TDI	GII	G E N P O W E R	G N P	355M	Stand By	660,0	528,0	953,8
				Prime							600,0	480,0	867,1	
				Continuous							420,0	336,0	606,9	
GNT 660	60	277/480	0,8	1800	I N T E R	E816TDI	GII	G E N P O W E R	G N P	315L	Stand By	660,0	528,0	953,8
				Prime							600,0	480,0	867,1	
				Continuous							420,0	336,0	606,9	

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	127
Stroke	mm	165
Displacement	L	12,56
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 ²	3,28
Flywheel	kg • m ²	2,54

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	2179
Width	mm	1330
Height	mm	1440
Dry Weight	Kg	1354

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

Cooling System

Radiator Type	50°C	Tropical
Total Coolant Capacity	L	68
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 ³ / h	5,60
Min. Pressure Before Coolant Pump	bar	0,5
Radiator Face Area	m ²	1,375
Rows	Row	5
Matrix Density	Per / Inch	15,5
Material		Aluminum
Width of Matrix	mm	1250
Height of Matrix	mm	1100
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	28
Minimum Oil Level	L	26
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	42
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

GNT 660 & 660

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

Diesel Engine Matching Parameters

50 Hz @ 1500 r/min

		Stand By	Prime
Gross Engine Power	kW	580,0	527,0
Net Engine Power	kW	556,0	504,0
Fan Power Consumption (Belt Pulley Driven)	kW	22,0	22,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	3,69	3,36
Intake Air Flow	m ³ / min	40,43	38,50
Exhaust Temperature Limit	°C	670	670
Exhaust Flow	m ³ / min	74,17	70,63
Boost Pressure Ratio		3,40	3,20
Mean Piston Speed	m / s	8,3	8,3
Cooling Fan Air Flow	m ³ / min	786,0	786,0
Typical Generator Output Power	kVA	660	598

Heat Rejection

Energy in Fuel (Heat of Combustion)	kW	1450,0	1318,0
Gross Heat to Power	kW	580,0	527,0
Energy to Coolant and Lubricating Oil	kW	290,0	264,0
Heat Dissipation Capacity*	kW	102,0	92,0
Energy to Exhaust	kW	421,0	382,0
Heat to Radiation	kW	58,0	53,0

*Intake Intercooled System

60 Hz @ 1800 r/min

		Stand By	Prime
Gross Engine Power	kW	580,0	527,0
Net Engine Power	kW	551,6	499,1
Fan Power Consumption (Belt Pulley Driven)	kW	26,4	26,4
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	3,08	2,80
Intake Air Flow	m ³ / min	40,43	38,50
Exhaust Temperature Limit	°C	650	650
Exhaust Flow	m ³ / min	74,17	70,63
Boost Pressure Ratio		3,40	3,20
Mean Piston Speed	m / s	9,9	9,9
Cooling Fan Air Flow	m ³ / min	786,0	786,0
Typical Generator Output Power	kVA	647	586

Heat Rejection

Energy in Fuel (Heat of Combustion)	kW	1452,0	1294,0
Gross Heat to Power	kW	580,0	501,0
Energy to Coolant and Lubricating Oil	kW	290,0	264,0
Heat Dissipation Capacity*	kW	101,0	92,0
Energy to Exhaust	kW	421,0	382,0
Heat to Radiation	kW	61,0	55,0

*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	1,035	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

Brand/Model	Genpower	355M	Optional Using Alternator				Stamford	SSL1D-D	
Duty			Continuous		Leroy Somer	TAL047E			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	600,0	600,0	623,0	-	660,0	660,0	685,0	-
Output Power	kW	480,0	480,0	498,4	-	528,0	528,0	548,0	-

60 Hz - 277/480V - Cos Q 0,8 - 1800 rpm

Standard Using Alternator

Brand/Model	Genpower	315L	Optional Using Alternator				Stamford	HC5C	
Duty			Continuous		Leroy Somer	TAL047C			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	580,0	611,0	643,0	-	638,0	672,0	707,0	-
Output Power	kW	464,0	488,8	514,4	-	510,4	537,6	565,6	-

GNT SERIES

GNT 660 & 660

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

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

GNT SERIES

GNT 660 & 660

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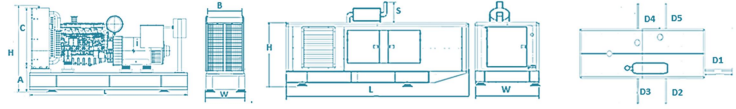
231/400V - 50Hz & 277/480V - 60Hz

Generator Dimensions

Values		Open Type Generator	Canopy Type Generator
Width	mm	1400	1646
Length	mm	3600	4632
Height	mm	2070	2641
Weight (Net)	Kg	3444	4190
Fuel Tank Capacity	L	1193	400

Generator Technical Drawings

SYMBOL	OPEN	CANOPY
L	3600	4632
W	1400	1646
H	2070	2600
A	775	641
B	1250	
C	1300	
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

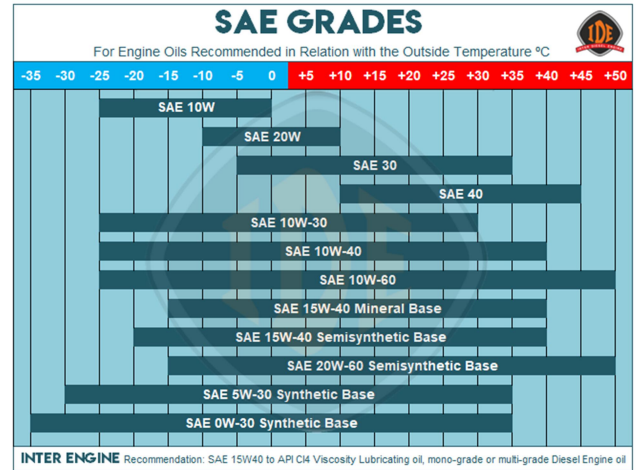
INTER Diesel Engine Power Ratings							
Engine Model	EB16TDI	Engine Family		ID43	Engine Series	GII	
Speed rpm	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	Hp	kWm	Hp
1500	Stand By (Maximum)	660.0	528.0	580.0	778.5	556.0	746.3
	Prime	598.0	478.0	527.0	707.4	504.0	676.5
1800	Stand By (Maximum)	660.0	528.0	580.0	778.5	556.0	746.3
	Prime	598.0	478.0	527.0	707.4	504.0	676.5

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

Fuel Consumption				
Percent of Prime power	1500 rpm		1800 rpm	
	g/kWh	l/hr	g/kWh	l/hr
110%	197	129,6	197,0	129,6
100%	195	116,2	195,0	116,2
75%	198	88,5	198,0	88,5
50%	200	59,6	200,0	59,6

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[®]
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