

# 100kVA Generator Datasheet PDF - Complete Technical Specifications and Download Guide

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# 100kVA Generator Datasheet PDF - Complete Technical Specifications and Download Guide

## Introduction

The 100kVA generator represents one of the most versatile and widely-used power generation solutions in the industrial and commercial sectors. This comprehensive datasheet provides detailed technical specifications, performance characteristics, and application guidelines for 100kVA diesel generator sets. Whether you are specifying equipment for a new installation, planning a backup power system, or conducting maintenance on existing infrastructure, this document serves as your authoritative reference for all technical parameters.

A 100kVA generator typically delivers 80kW of prime power at 0.8 power factor, making it suitable for medium-scale commercial applications, construction sites, manufacturing facilities, and critical backup power installations. The popularity of this capacity range stems from its optimal balance between power output, fuel efficiency, physical footprint, and total cost of ownership. These units are available in both prime power and standby ratings, with various engine and alternator configurations to meet specific application requirements.

Modern 100kVA generators incorporate advanced electronic control systems, emissions-compliant engines, and sophisticated monitoring capabilities. The integration of digital control panels enables remote monitoring, automatic start/stop functionality, and comprehensive protection systems. This datasheet covers the essential technical parameters that engineers, facility managers, and procurement specialists need when evaluating, installing, or maintaining 100kVA generator systems.

## Technical Specifications

### *Engine Specifications*

Parameter	Specification
Prime Power Output	100 kVA / 80 kW
Standby Power Output	110 kVA / 88 kW
Rated Voltage	400V / 230V (3-phase)
Rated Frequency	50 Hz
Rated Current (Prime)	144.3 A
Power Factor	0.8 (lagging)
Engine Type	4-cycle, Turbocharged Diesel
Number of Cylinders	4 or 6 (depending on model)
Displacement	4.5L - 5.9L
Bore x Stroke	Varies by manufacturer
Compression Ratio	16.5:1 - 18:1
Aspiration	Turbocharged with aftercooler
Governor Type	Electronic
Governor Class	ISO 8528-5 Class G3

### ***Fuel System Specifications***

Parameter	Specification
Fuel Consumption (100% Load)	22-26 L/hr
Fuel Consumption (75% Load)	17-20 L/hr
Fuel Consumption (50% Load)	12-14 L/hr
Fuel Type	ASTM D975 No. 2-D Diesel
Fuel Tank Capacity (Base)	150-200 L
Fuel Tank Capacity (Optional)	Up to 500 L
Fuel Injection System	Direct injection, electronic
Fuel Filter Type	Dual-stage with water separator

### ***Electrical Specifications***

Parameter	Specification
Alternator Type	Brushless, self-excited
Insulation Class	H
Protection Class	IP23 (standard) / IP44 (optional)
Voltage Regulation	$\pm 1.0\%$ (steady state)
Frequency Regulation	$\pm 0.5\%$ (isochronous)
THD (Total Harmonic Distortion)	$< 5\%$
Transient Response (Load Step)	Recovers to $\pm 10\%$ within 3 seconds
Starting Capability	50% of rated kVA in one step
Alternator Cooling	Self-ventilated

### ***Physical Specifications***

Parameter	Specification
Length (Canopy)	2200-2500 mm
Width (Canopy)	900-1100 mm
Height (Canopy)	1300-1500 mm
Dry Weight (Canopy)	1200-1500 kg
Operating Weight	1350-1700 kg
Sound Level at 1m (Canopy)	65-75 dB(A)
Sound Level at 7m (Canopy)	55-65 dB(A)
Cooling System	Radiator with belt-driven fan
Coolant Capacity	15-25 L

## ***Environmental Specifications***

Parameter   Specification
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Operating Temperature Range   -15°C to +50°C
Storage Temperature Range   -40°C to +60°C
Altitude Capability   Up to 1000m (standard), derate above
Humidity   Up to 95% non-condensing
Emissions Compliance   EU Stage V / EPA Tier 4 Final

## **Performance Curves Description**

### ***Load-Fuel Consumption Curve***

The fuel consumption curve for a 100kVA generator demonstrates a characteristic non-linear relationship between load percentage and fuel consumption rate. At 25% load, the unit typically consumes approximately 8-10 liters per hour, representing about 35-40% of full-load consumption. As load increases to 50%, consumption rises to 12-14 L/hr, showing improved fuel efficiency per kilowatt-hour generated. The optimal efficiency point typically occurs between 70-80% load, where the generator achieves maximum brake specific fuel consumption (BSFC) ratings.

From 75% to 100% load, fuel consumption increases more steeply, reaching 22-26 L/hr at full rated output. This curve characteristic indicates that operating the generator between 50-80% load provides the best fuel economy and engine longevity. Running at very low loads (below 30%) for extended periods can lead to wet stacking, carbon buildup, and reduced engine life due to incomplete combustion and lower cylinder temperatures.

### ***Temperature Derating Curve***

The temperature derating curve illustrates how generator output capacity decreases when ambient temperature exceeds the rated reference point (typically 25°C or 40°C depending on standard). Above 40°C ambient, most 100kVA units require derating of approximately 1-2% per additional 5°C increment. At 50°C ambient, the generator may only deliver 90-95% of its rated capacity. This derating applies to both prime and standby ratings and must be considered when sizing systems for hot climate installations.

### ***Altitude Derating Curve***

Altitude significantly affects generator performance due to reduced air density at higher elevations. The standard rating applies up to 1000 meters above sea level. Above this threshold, derating factors of 3-5% per 500 meters typically apply. At 2000m elevation, a 100kVA generator may only deliver 85-90 kVA. At 3000m, capacity may drop to 75-80 kVA. Turbocharged engines with aftercoolers generally perform better at altitude compared to naturally aspirated units, but derating is still necessary.

### ***Load Acceptance Curve***

The load acceptance curve demonstrates the generator's ability to accept sudden load steps without excessive voltage or frequency deviation. For a properly sized 100kVA generator with modern electronic controls, the unit

can accept 50% of rated load in a single step while maintaining voltage within  $\pm 15\%$  and frequency within  $\pm 10\%$ . After the initial transient, voltage recovers to within  $\pm 5\%$  within 2-3 seconds and to steady-state within 5 seconds. Sequential loading of multiple smaller steps provides smoother operation and reduced stress on mechanical components.

## **Compatible Applications**

### ***Commercial Buildings***

100kVA generators are ideally suited for medium-sized commercial buildings including office complexes, retail centers, hotels, and educational institutions. They can support critical loads such as lighting, HVAC systems, elevators, fire safety systems, and IT infrastructure. For buildings with total loads between 60-90 kW, a 100kVA unit provides adequate margin for future expansion while maintaining efficient operation.

### ***Healthcare Facilities***

Medical clinics, dental offices, and small hospitals utilize 100kVA generators to ensure continuous operation of life-safety systems, diagnostic equipment, refrigeration for medicines, and essential lighting. Healthcare applications require generators with automatic transfer switches (ATS) and remote monitoring capabilities to meet regulatory requirements for backup power reliability.

### ***Industrial Applications***

Manufacturing facilities, food processing plants, and workshops benefit from 100kVA generators for production equipment, material handling systems, and environmental controls. The robust construction and industrial-grade components ensure reliable operation in demanding environments with dust, vibration, and temperature variations.

### ***Construction Sites***

Mobile and rental 100kVA generators provide temporary power for construction equipment, welding operations, concrete curing, lighting, and site offices. Trailer-mounted configurations offer mobility between job sites, while skid-mounted units provide semi-permanent installations for longer-term projects.

### ***Telecommunications***

Cell towers, data centers, and communication facilities require reliable backup power to maintain connectivity during utility outages. 100kVA generators equipped with extended fuel tanks and remote monitoring ensure uninterrupted operation of critical communication infrastructure.

### ***Agricultural Operations***

Farms, greenhouses, and agricultural processing facilities use 100kVA generators for irrigation systems, climate control, refrigeration, and processing equipment. The units provide reliable power in remote locations where utility service may be unreliable or unavailable.

### ***Residential Complexes***

Large residential buildings, apartment complexes, and gated communities install 100kVA generators to power common area lighting, elevators, water pumps, security systems, and emergency lighting. These installations often incorporate automatic transfer switches and weekly exercise programs.

## Download PDF Section

### *Official Datasheet Downloads*

Complete technical datasheets for 100kVA generators are available for download from manufacturer websites. These PDF documents contain detailed specifications, dimensional drawings, electrical schematics, and installation guidelines. When downloading, ensure you select the correct model variant and rating (prime or standby) to match your application requirements.

### *Required Information for Datasheet Request*

When requesting detailed datasheets from manufacturers or distributors, provide the following information:

- Application type (prime power, standby, or continuous)
- Ambient conditions (temperature, altitude, humidity)
- Voltage and frequency requirements
- Enclosure type (open skid, weatherproof, or sound-attenuated)
- Emissions compliance requirements
- Control system preferences
- Optional features (fuel tank size, ATS compatibility, remote monitoring)

### *Documentation Package Contents*

A complete 100kVA generator documentation package typically includes:

- Technical specification sheet
- Dimensional drawings (plan, elevation, and isometric views)
- Electrical connection diagrams
- Foundation and mounting requirements
- Fuel system installation guide
- Control panel operation manual
- Maintenance schedule and procedures
- Parts catalog with exploded views
- Warranty terms and conditions

## Frequently Asked Questions

1. What is the difference between prime power and standby power ratings for a 100kVA generator?

Prime power rating indicates the generator can run continuously at variable loads for unlimited hours per year, with an average load factor of 70%. Standby power rating applies to emergency backup applications where the generator runs only during utility outages, typically less than 200 hours per year, with no overload capability.

2. How much fuel does a 100kVA generator consume per hour?

At full load, a 100kVA generator typically consumes 22-26 liters per hour. At 75% load, consumption drops to 17-20 L/hr, and at 50% load, it uses approximately 12-14 L/hr. Actual consumption varies based on engine efficiency, load characteristics, and environmental conditions.

3. What size breaker do I need for a 100kVA generator?

For a 100kVA generator at 400V three-phase with 144.3A rated current, a 160A or 175A circuit breaker is typically recommended. The breaker should be sized at 110-125% of the full-load current to accommodate starting transients and ambient temperature variations.

4. Can a 100kVA generator power a whole building?

A 100kVA generator can power a medium-sized building with total connected loads up to 80kW, considering diversity factors. For critical loads only (life-safety, elevators, emergency lighting), it can support larger buildings. A load calculation by a qualified engineer is necessary to determine appropriate sizing.

5. How often should I service my 100kVA generator?

Standard maintenance intervals include oil and filter changes every 250-500 operating hours or annually, whichever comes first. Air cleaners require inspection every 50-100 hours and replacement as needed. Fuel filters should be changed annually or every 500 hours. A comprehensive service schedule is provided in the operation manual.

6. What type of fuel does a 100kVA diesel generator use?

100kVA generators use diesel fuel conforming to ASTM D975 No. 2-D specifications. In cold weather, winter-blend diesel or fuel additives may be necessary to prevent gelling. Some units can be configured for biodiesel blends up to B20, though manufacturer approval is required.

7. How loud is a 100kVA generator?

Open-set generators produce 85-95 dB(A) at 1 meter. Sound-attenuated canopy units reduce noise to 65-75 dB(A) at 1 meter and 55-65 dB(A) at 7 meters. Silent-rated enclosures can achieve levels below 60 dB(A) at 7 meters for noise-sensitive applications.

8. What is the typical lifespan of a 100kVA generator?

With proper maintenance, a 100kVA diesel generator can achieve 15,000-25,000 operating hours before major overhaul. In standby applications with limited running hours, the generator can provide 20-30 years of service. Regular maintenance and proper loading significantly impact longevity.

9. Do I need a permit to install a 100kVA generator?

Most jurisdictions require permits for generator installations. Requirements typically include electrical permits, building permits for enclosures, environmental permits for fuel storage, and possibly air quality permits depending on emissions regulations and hours of operation. Consult local authorities for specific requirements.

10. Can I run a 100kVA generator in parallel with another generator?

Yes, 100kVA generators can be paralleled with identical or different capacity units when equipped with proper synchronizing equipment and controls. Paralleling enables load sharing, redundancy, and capacity expansion. Generator sets must have compatible voltage, frequency, and control systems for successful paralleling.

11. What is the recommended battery for a 100kVA generator?

Most 100kVA generators use two 12V batteries connected in series for a 24V starting system. Battery capacity typically ranges from 100-150 Ah per battery. Maintenance-free AGM or gel batteries are recommended for reliability in standby applications. Replace batteries every 3-5 years.

12. How long does it take to start a 100kVA generator?

Modern 100kVA generators with electronic controls can start and accept load within 8-15 seconds after receiving a start signal. Automatic transfer switches typically add another 3-5 seconds for the transfer operation. Total time from utility failure to generator power is typically 10-20 seconds.

13. What maintenance can I perform myself on a 100kVA generator?

Operators can perform routine inspections, check fluid levels, monitor control panel readings, and keep the unit clean. Oil changes, filter replacements, and adjustments should be performed by qualified technicians. Major repairs, electrical work, and fuel system maintenance require trained personnel with appropriate tools and documentation.

14. How do I calculate the required generator size for my application?

Calculate the total connected load in kW, apply a diversity factor to account for non-simultaneous operation, and add 20-25% margin for future expansion and starting currents. Motor starting requires special consideration due to high inrush currents. Consult a qualified engineer for accurate sizing.

15. What emissions standards apply to 100kVA generators?

Emissions requirements vary by region and application. In the EU, Stage V standards apply to all generator sets above 19kW. In the US, EPA Tier 4 Final regulations apply. Standby generators may have exemptions in some jurisdictions. Verify local requirements before purchasing.

## Related Downloads

### ***Engine Manufacturer Documentation***

- Cummins 4BTAA-G2 Engine Datasheet
- Perkins 1104A-44TG2 Technical Manual
- Volvo Penta TAD731GE Engine Specifications
- FPT NEF67 Engine Workshop Manual

### ***Alternator Documentation***

- Stamford S4L1D Alternator Datasheet
- Leroy Somer LSA44.3 Technical Specifications
- Mecc Alte ECO40-1S/4 Datasheet

- Marathon Electric 284 Datasheet

### ***Control System Manuals***

- Deep Sea Electronics DSE7320 Auto Start Controller Manual
- ComAp IntelliGen NT Controller Manual
- Woodward EasyGen-3500 Operation Guide
- Datakom DKG-327 Automatic Transfer Switch Controller

### ***Installation and Application Guides***

- Generator Set Installation Guidelines (ISO 8528-9)
- Foundation Design Guide for Diesel Generators
- Fuel System Installation Best Practices
- Ventilation and Cooling Requirements for Generator Rooms
- Sound Attenuation Design for Generator Enclosures

### ***Regulatory Compliance Documents***

- EU Stage V Emissions Certification
- EPA Tier 4 Final Certificate of Conformity
- CE Declaration of Conformity
- ISO 8528 Generator Set Standard Summary
- Local Authority Compliance Checklist

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