

# 750kVA Generator Datasheet PDF - Complete Technical Specifications and Download Guide

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# 750kVA Generator Datasheet PDF - Complete Technical Specifications and Download Guide

## Introduction

The 750kVA generator represents a major industrial power generation asset, delivering substantial electrical output for large-scale facilities, critical infrastructure, and demanding industrial applications. This comprehensive datasheet provides detailed technical specifications, performance characteristics, engineering data, and application guidance for 750kVA diesel generator sets, serving as the authoritative reference for consulting engineers, project managers, and facility operators responsible for major power system installations.

Capable of delivering 600kW of prime power at 0.8 power factor, the 750kVA generator addresses the power requirements of large hospitals, major manufacturing facilities, data centers, commercial complexes, and critical infrastructure installations. These significant power generation units require substantial investment and demand careful engineering for installation, operation, and maintenance. The 750kVA capacity enables true facility-wide backup power or prime power for substantial operations, eliminating the need for load shedding during utility transitions.

Advanced engineering in modern 750kVA generators incorporates high-efficiency emissions-compliant engines with sophisticated fuel management and after-treatment systems, premium alternators with advanced excitation and voltage regulation, intelligent control systems with comprehensive monitoring and protection, and robust mechanical systems designed for reliable long-term operation. These technological capabilities enable compliance with stringent environmental regulations while delivering exceptional performance across diverse operating conditions.

## Technical Specifications

### *Engine Specifications*

Parameter	Specification
Prime Power Output	750 kVA / 600 kW
Standby Power Output	825 kVA / 660 kW
Rated Voltage	400V / 230V (3-phase)
Rated Frequency	50 Hz
Rated Current (Prime)	1082.6 A
Power Factor	0.8 (lagging)
Engine Type	4-cycle, Turbocharged Intercooled Diesel
Number of Cylinders	8, 12, or 16
Displacement	18.0L - 28.0L
Bore x Stroke	Varies by manufacturer
Compression Ratio	14.0:1 - 16.0:1
Aspiration	Sequential turbocharging with charge cooling
Governor Type	Electronic

| Governor Class | ISO 8528-5 Class G3 |

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

| Parameter | Specification |

|-----|-----|

| Fuel Consumption (100% Load) | 148-175 L/hr |

| Fuel Consumption (75% Load) | 115-135 L/hr |

| Fuel Consumption (50% Load) | 82-96 L/hr |

| Fuel Type | ASTM D975 No. 2-D Diesel |

| Fuel Tank Capacity (Base) | 800-1200 L |

| Fuel Tank Capacity (Optional) | Up to 4000 L |

| Fuel Injection System | Common rail or electronic unit pump |

| Fuel Filter Type | Multi-stage with water separator and priming system |

### ***Electrical Specifications***

| Parameter | Specification |

|-----|-----|

| Alternator Type | Brushless, self-excited, self-regulated |

| Insulation Class | H |

| Protection Class | IP23 (standard) / IP44 (optional) |

| Voltage Regulation |  $\pm 0.5\%$  (steady state) |

| Frequency Regulation |  $\pm 0.25\%$  (isochronous) |

| THD (Total Harmonic Distortion) |  $< 4\%$  |

| Transient Response (Load Step) | Recovers to  $\pm 10\%$  within 2 seconds |

| Starting Capability | 80% of rated kVA in one step |

| Alternator Cooling | Self-ventilated with external fan |

### ***Physical Specifications***

| Parameter | Specification |

|-----|-----|

| Length (Canopy) | 4500-5500 mm |

| Width (Canopy) | 1800-2200 mm |

| Height (Canopy) | 2100-2600 mm |

| Dry Weight (Canopy) | 7500-10000 kg |

| Operating Weight | 8500-11500 kg |

| Sound Level at 1m (Canopy) | 74-82 dB(A) |

| Sound Level at 7m (Canopy) | 64-72 dB(A) |

- | Cooling System | Radiator with belt or gear-driven fan |
- | Coolant Capacity | 60-90 L |

***Environmental Specifications***

- | Parameter | Specification |
- |-----|-----|
- | Operating Temperature Range | -25°C to +50°C |
- | Storage Temperature Range | -40°C to +65°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 characteristics of a 750kVA generator demonstrate substantial fuel requirements commensurate with the large power output. At 25% load (187.5 kVA), consumption ranges from 55-65 liters per hour, representing approximately 35-38% of full-load consumption. The relatively high percentage at low loads reflects fixed engine overhead losses and auxiliary system demands.

As load increases to 50% (375 kVA), fuel consumption rises to approximately 82-96 L/hr. The optimal efficiency operating window lies between 65-85% load, where specific fuel consumption reaches minimum values. At 75% load (562.5 kVA), consumption reaches 115-135 L/hr, representing efficient operation for the power delivered. Full-load operation at 750 kVA requires 148-175 L/hr depending on engine technology, ambient conditions, and fuel quality.

The fuel consumption curve highlights the importance of proper load matching. For installations with highly variable loads, consideration should be given to multiple paralleled generators that can be brought online as load increases, optimizing overall fuel efficiency. Extended operation below 30% load should be avoided to prevent wet stacking and maintain engine health.

***Temperature Derating Curve***

High ambient temperatures significantly impact 750kVA generator output capability through multiple mechanisms. Standard ratings apply at reference temperatures of 25°C or 40°C. Above 40°C ambient, derating factors of 1.5-2.5% per 5°C increment apply. At 50°C ambient, output may be limited to 90-95% of rated capacity.

The derating effects result from reduced air density affecting combustion efficiency, decreased charge air cooler effectiveness, reduced radiator cooling capacity, and increased alternator temperature rise. Large generators with high specific power output may experience more pronounced temperature sensitivity. Hot climate installations should consider oversizing or enhanced cooling systems.

***Altitude Derating Curve***

High altitude operation affects 750kVA generators through reduced air density impacting both combustion and cooling. Standard ratings apply up to 1000 meters above sea level. Above this elevation, derating of 3-4% per 500 meters typically applies. At 2000 meters elevation, expect approximately 85-90% of rated capacity. At 3000 meters, output may drop to 75-82% of the sea-level rating.

Turbocharged engines with advanced charge cooling systems demonstrate improved altitude performance. However, both engine combustion efficiency and cooling system capacity are affected by altitude. For high-altitude installations, consult with the manufacturer for specific derating guidance and potential system modifications.

### ***Load Step Response Curve***

The load step response characteristics of a 750kVA generator benefit from substantial rotating mass and advanced control systems. These units can typically accept 80% of rated load (600 kVA) in a single step while maintaining voltage deviation within  $\pm 10\%$  and frequency deviation within  $\pm 6\%$ . The high inertia of large rotating components provides excellent frequency stability during transient events.

Recovery to steady-state voltage typically occurs within 1.5-2.5 seconds, with frequency recovery within 2-3 seconds. The substantial capacity provides excellent motor starting capability, often eliminating the need for reduced voltage starting methods for large motors within the facility. Response characteristics vary based on engine technology and control system configuration.

## **Compatible Applications**

### ***Large Hospitals and Medical Centers***

750kVA generators provide comprehensive backup power for major hospitals, medical centers, and healthcare complexes. These units support complete facility operations including life-safety systems, surgical suites, critical care, diagnostic imaging, laboratories, pharmaceutical storage, and all normal building loads. Healthcare applications require compliance with specific regulatory standards for reliability, testing, and maintenance.

### ***Major Industrial Facilities***

Large manufacturing plants, process industries, and industrial complexes rely on 750kVA generators for production equipment, process controls, compressed air, material handling, environmental systems, and facility operations. The substantial capacity enables complete production continuity during utility outages rather than selective load support.

### ***Large Data Centers***

Enterprise data centers, colocation facilities, and cloud computing installations depend on 750kVA generators for primary backup power. These applications require reliable power with fast response, automatic synchronization with UPS systems, N+1 or 2N redundancy configurations, and comprehensive monitoring. Generator availability directly impacts data center uptime guarantees.

### ***Major Commercial Complexes***

Large office complexes, shopping centers, hotels, entertainment venues, and mixed-use developments utilize 750kVA generators for complete facility backup. The substantial capacity enables support for HVAC systems,

elevators, lighting, security systems, IT infrastructure, and all normal operations without load shedding during utility transitions.

### ***Utility and Critical Infrastructure***

Power plants, substations, water treatment facilities, telecommunications facilities, and critical infrastructure installations require 750kVA generators for essential backup power. These applications often require extended fuel storage, remote monitoring, automatic operation, and high reliability for unmanned facilities.

### ***Educational and Research Institutions***

University campuses, research facilities, and large educational institutions utilize 750kVA generators for academic buildings, research laboratories, computing facilities, dormitories, dining services, and safety systems. Multiple generators may be paralleled for campus-wide power distribution with redundancy.

## **Download PDF Section**

### ***Official Datasheet Downloads***

Complete technical datasheets for 750kVA generators are available from manufacturer websites and authorized distributors. These comprehensive PDF documents contain detailed specifications, performance data, dimensional drawings, electrical schematics, installation requirements, and maintenance procedures. Documentation is essential for proper specification, installation, commissioning, and ongoing operation.

### ***Documentation Package Contents***

A complete 750kVA generator documentation set includes:

- Comprehensive technical specification sheet
- Performance curves and operating data
- Dimensional drawings with detailed dimensions
- Electrical schematics and wiring diagrams
- Control system documentation and manuals
- Foundation design requirements
- Fuel system installation specifications
- Ventilation and exhaust system requirements
- Vibration isolation and mounting details
- Detailed maintenance procedures and schedules
- Parts catalog with component specifications
- Installation and commissioning checklists
- Warranty documentation and registration

### ***Technical Support Resources***

Manufacturer technical support provides:

- Application engineering and system design
- Detailed sizing calculations and analysis
- Installation supervision and commissioning
- Troubleshooting and diagnostic support
- Spare parts supply and logistics
- Operator and technician training programs
- Software updates and configuration support
- Technical bulletins and service updates

## Frequently Asked Questions

1. What is the fuel consumption of a 750kVA generator per hour?

A 750kVA generator consumes approximately 148-175 liters per hour at full load (750 kVA / 600 kW). At 75% load, consumption drops to 115-135 L/hr. At 50% load, expect 82-96 L/hr. Actual consumption depends on engine technology, load profile, and ambient conditions.

2. What electrical infrastructure is needed for a 750kVA generator?

A 750kVA generator requires substantial electrical infrastructure including appropriately sized switchgear (typically 1250A-1600A), busways or multiple parallel cable runs, protection devices, and automatic transfer equipment. The electrical installation must be designed by a qualified engineer and comply with all applicable codes and standards.

3. What foundation is required for a 750kVA generator?

A 750kVA generator requires a substantial reinforced concrete foundation with dimensions approximately 150-200% of the generator footprint, thickness of 400-500mm, and mass 1.5-2 times the generator weight (15,000-20,000 kg total). The foundation must be isolated from building structures, properly supported on suitable soil, and include vibration isolation provisions.

4. How much fuel storage do I need for a 750kVA generator?

At full-load consumption of approximately 160 L/hr, a 10,000-liter fuel tank provides approximately 60 hours of operation. Required storage depends on utility reliability, fuel delivery logistics, regulatory requirements, and operational needs. Many facilities install bulk storage tanks with day tanks for extended operation capability.

5. What maintenance does a 750kVA generator require?

Maintenance includes daily inspections, weekly test runs, monthly battery and transfer switch tests, quarterly filter inspections, semi-annual comprehensive inspections, and annual major service including all fluids, filters, and component inspection. Major services at specified intervals include valve adjustments, injector testing, and comprehensive system checks. Follow manufacturer-specific schedules.

6. Can 750kVA generators be paralleled?

Yes, 750kVA generators can be paralleled with identical or different capacity units using appropriate synchronizing controls, switchgear, and protection systems. Paralleling enables capacity expansion, load sharing, redundancy, and optimized operation. Multiple 750kVA units can provide 1.5 MVA, 2.25 MVA, or higher total capacity.

#### 7. What emissions controls are on a 750kVA generator?

Stage V / Tier 4 Final compliant 750kVA generators include diesel oxidation catalysts (DOC), diesel particulate filters (DPF) with regeneration, and selective catalytic reduction (SCR) with DEF injection. These systems require regular maintenance, monitoring, and consumables (DEF fluid) to maintain emissions compliance and proper operation.

#### 8. How long does a 750kVA generator last?

With proper maintenance, a 750kVA generator can achieve 35,000-50,000 operating hours before major overhaul. In standby applications, service life typically ranges from 25-35 years. Maintenance quality, operating conditions, proper loading, and environmental factors significantly impact longevity.

#### 9. What is the difference between prime and standby rating?

Prime-rated 750kVA generators can operate continuously at variable loads with unlimited hours per year, accepting 10% overload for limited periods. Standby-rated units provide maximum output for limited hours (typically <200 hours/year) during utility outages with no overload capability. Prime-rated units feature more robust construction for extended operation.

#### 10. What size transfer switch do I need?

For a 750kVA generator with 1082.6A rated current, a 1250A or 1600A automatic transfer switch is typically required. The ATS must be rated for the application class (emergency, legally required, optional standby) and comply with applicable standards. Multiple ATS units may be used for different load categories.

#### 11. How do I transport a 750kVA generator?

750kVA generators weighing 8,000-12,000 kg require heavy haul transport with appropriate permits and routing. Standard shipping containers cannot accommodate these units; specialized flatbed trailers with crane loading are required. Transportation planning should consider route restrictions, permit requirements, and site access.

#### 12. What ventilation does a 750kVA generator need?

A 750kVA generator requires substantial ventilation for combustion air, cooling air, and heat rejection. Minimum ventilation rates typically range from 4-6 m<sup>3</sup>/s depending on ambient conditions and installation configuration. Proper ventilation design prevents overheating, ensures adequate combustion air, and maintains acceptable operating temperatures.

#### 13. What is the recommended testing frequency?

Standby generators should be tested weekly (no-load) and monthly (with load) per NFPA 110. Load bank testing should be performed at least annually to verify full-load capability. Healthcare facilities have specific testing requirements per CMS regulations. Transfer switch testing and battery testing are also required components.

#### 14. What control system features are available?

Modern 750kVA generators offer sophisticated control systems including automatic start/stop, synchronizing for parallel operation, load sharing, remote monitoring via Ethernet or cellular, comprehensive protection functions, data logging, and integration with building management systems. Control system selection should match application requirements.

#### 15. What are the installation timeline and requirements?

Complete installation of a 750kVA generator including foundation, electrical systems, fuel systems, exhaust systems, and commissioning typically requires 8-16 weeks depending on site conditions, permitting, and complexity. Planning should begin months in advance. Major milestones include foundation construction, equipment delivery, electrical installation, fuel system installation, and commissioning.

## Related Downloads

### ***Engine Technical Documentation***

- Cummins QSK23-G5 Engine Specifications
- Perkins 4008-23TAG2A Technical Manual
- Volvo Penta TAD1653GE Engine Datasheet
- MTU Series 4000 Engine Manual
- Mitsubishi S16R-PTA Engine Specifications

### ***Alternator Documentation***

- Stamford UCDI274K Alternator Datasheet
- Leroy Somer LSA53.1 Technical Manual
- Mecc Alte ECO58-1LN/4 Specifications
- Marathon Electric 774 Datasheet
- Siemens 1FC6 Series Technical Data

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

- Deep Sea Electronics DSE8860 MKII Controller
- ComAp IntelliGen-NT-CB Paralleling System
- Woodward easYgen-3200XT Operation Manual
- Deif AGC-4 Automatic Genset Controller
- Smartgen HGM9510 Controller Manual

### ***Installation Standards***

- ISO 8528-9:2017 Generator Installation
- BS 7671 IET Wiring Regulations
- NFPA 110 Emergency Power Systems
- IEC 60364 Electrical Installations
- Local Building and Fire Codes

### ***Application Engineering Guides***

- Generator Sizing Methodology
- UPS System Compatibility Guide
- Paralleling System Design
- Fuel System Engineering
- Ventilation Design Manual
- Seismic and Wind Restraint
- Sound Attenuation Design
- Vibration Isolation Guidelines

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