Perkins Engine Technical Datasheet PDF - Complete Specifications and Application Guide

Free Download - Generator Resource Center

Perkins engines have established a legendary reputation in the power generation industry, delivering exceptional reliability, fuel efficiency, and performance across a comprehensive range of generator applications. This technical datasheet provides detailed specifications, performance characteristic...

Shandong Huaquan Power Co., Ltd.

Website: www.huaquanpower.com

Email: huaquan@huaquanpower.com

Phone/WhatsApp: +86 15905360672

Perkins Engine Technical Datasheet PDF - Complete Specifications and Application Guide

Introduction

Perkins engines have established a legendary reputation in the power generation industry, delivering exceptional reliability, fuel efficiency, and performance across a comprehensive range of generator applications. This technical datasheet provides detailed specifications, performance characteristics, and application guidance for Perkins engines used in generator sets, serving as the authoritative reference for engineers, specifiers, and maintenance professionals.

With over 85 years of engine manufacturing heritage and more than 21 million engines produced, Perkins has built an unmatched reputation for durable, efficient, and reliable diesel engines. The company offers engines ranging from 5 to 2500 kW for power generation, covering applications from small portable generators to large industrial power plants. Perkins engines are recognized globally for their robust engineering, excellent fuel economy, and extensive service network spanning 180 countries.

Modern Perkins generator engines incorporate advanced technologies including common rail fuel injection, advanced electronic control systems, sophisticated turbocharging, and comprehensive emissions after-treatment. These technologies enable Perkins engines to meet stringent Stage V and Tier 4 Final emissions requirements while maintaining the excellent fuel efficiency, transient response, and operational reliability that have defined the brand for decades.

Technical Specifications

Small Capacity Engines (20-100 kVA Applications)

Parameter	403D-15G	404D-22G	1103A-33G
Configuration	3-cylinder in-line	4-cylinder in-line	3-cylinder in-line
Displacement	1.5 L	2.2 L	3.3 L
Bore x Stroke	84mm x 90mm	84mm x 100mm	105mm x 127mm
Aspiration	Naturally aspirated	Turbocharged	Naturally aspirated
Fuel System	Mechanical	Mechanical	Mechanical
Prime Power Range	12-16 kW	18-25 kW	28-35 kW
Standby Power Range	13-18 kW	20-28 kW	31-38 kW
Governor Type	Mechanical/Electronic	Mechanical/Electronic	Mechanical/Electronic
Rated Speed	1500 RPM	1500 RPM	1500 RPM

Medium Capacity Engines (100-500 kVA Applications)

Parameter	1104A-44TG1	1106A-70TG1	1106C-70TAG2

Configuration	4-cylinder in-line	6-cylinder in-line	6-cylinder in-line
Displacement	4.4 L	7.0 L	7.0 L
Bore x Stroke	105mm x 127mm	105mm x 135mm	110mm x 136mm
Aspiration	Turbocharged	Turbocharged	Turbocharged aftercooled
Fuel System	Mechanical	Mechanical	Electronic
Prime Power Range	55-70 kW	85-105 kW	120-160 kW
Standby Power Range	60-77 kW	94-116 kW	132-176 kW
Governor Type	Mechanical/Electronic	Mechanical/Electronic	Electronic
Rated Speed	1500 RPM	1500 RPM	1500 RPM

Large Capacity Engines (500-1500 kVA Applications)

Parameter	1506A-E88TAG2	2206A-E13TAG2	2506A-E15TAG2
Configuration	6-cylinder in-line	6-cylinder in-line	6-cylinder in-line
Displacement	8.8 L	12.5 L	15.2 L
Bore x Stroke	112mm x 149mm	137mm x 142mm	137mm x 171mm
Aspiration	Turbocharged aftercooled	Turbocharged aftercooled	Turbocharged aftercooled
Fuel System	Electronic	Electronic	Electronic
Prime Power Range	160-220 kW	250-360 kW	350-500 kW
Standby Power Range	176-242 kW	275-396 kW	385-550 kW
Governor Type	Electronic	Electronic	Electronic
Rated Speed	1500 RPM	1500 RPM	1500 RPM

High Capacity Engines (1500+ kVA Applications)

Parameter	2806A-E18TAG2	4006-23TAG3A	4008-23TAG2A
Configuration	6-cylinder in-line	V12	V16
Displacement	18.1 L	23.0 L	30.6 L
Bore x Stroke	145mm x 183mm	135mm x 135mm	135mm x 135mm
Aspiration	Turbocharged aftercooled	Turbocharged aftercooled	Turbocharged aftercooled
Fuel System	Electronic	Electronic	Electronic
Prime Power Range	500-720 kW	600-850 kW	800-1100 kW
Standby Power Range	550-792 kW	660-935 kW	880-1210 kW
Governor Type	Electronic	Electronic	Electronic
Rated Speed	1500 RPM	1500 RPM	1500 RPM

Fuel System Specifications

Electronic Fuel Injection System

Parameter	Specification
Injection Type	Common Rail / EUI
Injection Pressure	Up to 2000 bar
Injection Timing	Electronically controlled
Governor Response	Isochronous electronic
Fuel Filter	Dual-stage with water separator
Fuel Type	ASTM D975 No. 2-D Diesel
Biodiesel Capability	B20 approved (check specific model)

Fuel Consumption Data (Typical Values at Prime Rating)

Engine Model	Full Load (L/hr)	75% Load (L/hr)	50% Load (L/hr)
404D-22G (22 kW)	6-7	5-5.5	3.5-4
1104A-44TG1 (60 kW)	16-18	12-14	9-10
1106C-70TAG2 (140 kW)	38-42	29-32	20-23
1506A-E88TAG2 (200 kW)	54-60	41-46	29-33
2206A-E13TAG2 (300 kW)	82-90	62-69	44-49
2506A-E15TAG2 (450 kW)	120-132	92-101	64-71

Emissions Control Systems

Stage V / Tier 4 Final Configuration

Component	Function	Maintenance Interval
Diesel Oxidation Catalyst (DOC)	Oxidizes CO and HC	3000-5000 hours
Diesel Particulate Filter (DPF)	Captures PM, active regeneration	Regeneration: automatic; cleaning: 3000-5000 hours
Selective Catalytic Reduction (SCR)	Reduces NOx emissions	DEF consumption: 3-5% of fuel
DEF Injection System	Doses DEF into exhaust	Filter: 2000-3000 hours
NOx Sensor	Monitors NOx levels	Replace as needed

DEF (Diesel Exhaust Fluid) Specifications

Parameter	Specification

DEF Standard	ISO 22241 / AUS 32
Concentration	32.5% urea solution
Consumption Rate	3-5% of fuel consumption
Storage Temperature	-11°C to +30°C
Shelf Life	12-18 months
Compatible Materials	HDPE, stainless steel

Electronic Control System

ADEM 4 Control System Features

Feature	Description
Governor Control	Isochronous electronic governor
Speed Regulation	±0.25% steady-state
Fuel Mapping	Optimized for generator applications
Diagnostics	Real-time monitoring and fault logging
Communication	J1939 CAN bus, Modbus RTU
Protection	Comprehensive engine protection
Remote Capability	Compatible with major controller brands

Engine Protection Parameters

Parameter	Typical Setting	Action
Low Oil Pressure	1.5-2.5 bar (model specific)	Warning/Shutdown
High Coolant Temperature	105-110°C	Warning/Shutdown
Overspeed	110-115% rated speed	Shutdown
Low Coolant Level	Level sensor	Shutdown
High Oil Temperature	120-130°C	Warning/Shutdown
Low Fuel Pressure	Model specific	Warning
High Exhaust Temperature	Model specific	Warning/Shutdown

Performance Curves Description

Power and Torque Characteristics

Perkins generator engines deliver essentially constant torque across the rated speed range, optimized for generator drive applications. The power output increases linearly with speed. This characteristic provides excellent load acceptance and transient response for generator applications where maintaining frequency stability

is critical.

Fuel Efficiency Maps

Perkins engines demonstrate excellent fuel efficiency across the operating range. The specific fuel consumption (grams per kilowatt-hour) varies with load and speed. Optimal efficiency typically occurs at 70-85% load. At lighter loads, efficiency decreases due to fixed mechanical and parasitic losses. Modern electronic engines optimize fuel injection timing and duration to maximize efficiency across all operating points.

Transient Response Characteristics

Perkins engines with electronic governing provide excellent transient response for generator applications. Load acceptance of 50-80% of rated load in a single step is typical, with recovery to rated speed within 2-4 seconds. The high-pressure fuel system and fast-acting electronic governor enable rapid fuel delivery changes to maintain speed stability during sudden load changes.

Compatible Applications

Standby Power Generation

Perkins engines are extensively used in standby generator applications, providing reliable backup power for hospitals, data centers, commercial buildings, telecommunications facilities, and critical infrastructure. The proven reliability, fast starting, and excellent transient response ensure rapid power restoration during utility outages.

Prime Power Generation

Perkins engines serve prime power applications in remote locations, construction sites, mining operations, and areas without reliable utility power. The robust design and excellent fuel economy make Perkins ideal for continuous duty applications. Prime power ratings allow unlimited operating hours at variable loads with appropriate maintenance.

Rental and Portable Generators

Perkins compact engines power rental and portable generator sets used in construction, events, and temporary power applications. The excellent power-to-weight ratio, reliable starting, and fuel efficiency make Perkins preferred for mobile power applications where performance and reliability are essential.

Industrial Power Applications

Perkins industrial engines provide power for compressors, pumps, and other mechanical drive applications. Industrial configurations feature heavy-duty bearings, various SAE flywheel housings, and flexible mounting options. The proven durability makes Perkins suitable for demanding industrial environments.

Download PDF Section

Official Perkins Documentation

Complete technical documentation for Perkins generator engines is available through Perkins distributors and the Perkins website. Documentation includes engine specification sheets, installation drawings, operation and maintenance manuals, and parts catalogs.

Available Documentation Types

- Engine Technical Data Sheets
- Performance Curve Documents
- Installation Guidelines
- Operation and Maintenance Manuals
- Parts Catalogs
- Service Bulletins
- Emissions Documentation
- Application Engineering Guides

Frequently Asked Questions

1. What is the expected service life of a Perkins generator engine?

With proper maintenance, Perkins generator engines typically achieve 20,000-35,000 operating hours before major overhaul depending on engine series and application. Larger engines (2000 Series) often exceed 40,000 hours. In standby applications with limited running hours, service life can exceed 25-30 years.

2. What are the recommended oil change intervals?

Oil change intervals for Perkins engines typically range from 250-500 hours depending on engine model, application, and operating conditions. Severe duty applications (dusty environments, frequent starting, low-load operation) may require more frequent changes. Always follow the maintenance schedule for your specific engine model.

3. What is the difference between prime and standby ratings?

Prime power rating allows unlimited operating hours at variable loads up to rated output, with average load factor not exceeding 70%. A 10% overload is available for limited periods. Standby rating applies to emergency backup with operating hours typically limited to 200 hours per year at rated output with no overload capability.

4. What fuel specifications should I use?

Perkins engines are designed for ASTM D975 No. 2-D diesel fuel. Most models are approved for biodiesel blends up to B20 with proper maintenance procedures. For cold weather operation, winter-blend fuel or additives may be required to prevent fuel gelling and ensure reliable starting.

5. What emissions standards do Perkins engines meet?

Current production Perkins generator engines meet EU Stage V and EPA Tier 4 Final emissions standards. These engines incorporate after-treatment systems including DOC, DPF, and SCR with DEF injection. Earlier engine models meet previous emissions tiers (Stage IIIA, Tier 3, etc.).

6. Can Perkins engines operate at low load?

Extended operation below 30% load should be avoided as it can cause wet stacking, carbon buildup, and reduced engine efficiency. If low-load operation is unavoidable, periodic load bank operation helps maintain engine health. Consult Perkins application guidelines for specific recommendations.

7. What warranty coverage is available?

Warranty terms vary by engine model, application, and region. Standard warranty typically includes 1-2 years or 1000-2000 hours. Extended warranty programs are available through Perkins distributors. Consult your local distributor for specific warranty terms and coverage options.

8. How do I correctly size a Perkins engine for my generator?

Generator sizing requires analysis of total connected load, motor starting requirements, load characteristics, and environmental conditions. Perkins distributors offer sizing software and application engineering support. For accurate sizing, consult with a qualified engineer or contact your Perkins distributor.

9. What after-treatment system maintenance is required?

After-treatment maintenance includes DPF cleaning at specified intervals (typically 3000-5000 hours), DEF filter changes, and system monitoring. DEF consumption at 3-5% of fuel consumption requires regular tank refilling. Follow the specific maintenance schedule for your engine model.

10. Can Perkins diesel engines be converted to natural gas?

Perkins offers dedicated gas engines for generator applications. Conversion of diesel engines to natural gas is not supported by Perkins. Gas engines are specifically designed for gaseous fuel with appropriate components, compression ratios, and control systems.

11. What is DEF and why is it required?

DEF (Diesel Exhaust Fluid) is a 32.5% urea solution in deionized water used in SCR systems to reduce NOx emissions. DEF is injected into the exhaust where it reacts with NOx to produce nitrogen and water. DEF is required to meet Stage V / Tier 4 Final emissions standards.

12. Where can I obtain Perkins parts?

Perkins parts are available worldwide through authorized Perkins distributors and dealers. Parts can be identified using the engine serial number and parts catalog. Genuine Perkins parts are recommended to ensure proper fit, function, and warranty compliance.

13. What coolant should I use?

Perkins recommends heavy-duty diesel engine coolant meeting appropriate specifications. Use fully formulated coolant with proper additives. Extended-life coolants are available for reduced maintenance. Follow Perkins coolant recommendations for your specific engine model.

14. What diagnostic tools are available?

Perkins offers diagnostic software for engine analysis, parameter adjustment, and fault diagnosis. The diagnostic system connects via the J1939 data link. Contact your Perkins distributor for diagnostic tool availability and training.

15. What support does Perkins provide for generator applications?

Perkins provides comprehensive support including application engineering, installation guidance, commissioning assistance, operator training, maintenance training, and technical support through the global distributor network.

Service agreements and extended warranty programs are available.

Related Downloads

Engine Documentation

- Perkins 400 Series Operation Manual
- Perkins 1100 Series Technical Manual
- Perkins 1506 Series Service Manual
- Perkins 2206 Series Parts Catalog
- Perkins 2506 Series Installation Guide
- Perkins 4000 Series Technical Manual

Emissions Documentation

- Stage V After-treatment System Guide
- Tier 4 Final Compliance Documentation
- DEF Handling and Storage Guidelines
- DPF Maintenance Procedures
- Emissions Warranty Information

Application Guides

- Generator Sizing Guidelines
- Installation Standards
- Cooling System Design
- Fuel System Installation
- Ventilation Requirements
- Mounting Specifications

Control System Documentation

- ADEM 4 Control System Manual
- J1939 Communication Guide
- Electronic Governor Settings
- Diagnostic Software Guide
- Controller Integration Manuals

Service Documentation

- Preventive Maintenance Schedules
- Oil Analysis Guidelines
- Coolant Maintenance Procedures
- Filter Specifications
- Service Tool Requirements

Shandong Huaquan Power Co., Ltd.
Contact: +86 15905360672 | huaquan@huaquanpower.com
Website: www.huaquanpower.com