Industrial Diesel Generator Set – KD4500-F

50 Hz – Fuel Consumption Optimized

DATASHEET

12/2020

GROSS RATINGS RANGE		
Standby	kVA	4240 - 4600
	kWe	3392 - 3680
Data Center / Mission Critical	kVA	4240 - 4600
	kWe	3392 - 3680
Prime	kVA	4000 - 4180
	kWe	3200 - 3344

Benefits & features

KOHLER SDMO premium quality

- KOHLER SDMO provides **one source responsibility** for the generating set and accessories
- The generator set, its components and a wide range of options have been **fully developed, prototype tested, factory built**, and production-tested
- The generator sets are designed in accordance to ISO8528-5 performance **class G3** and accepts rated load in one step

KOHLER SDMO premium performances

Engines

- Low fuel consumption thanks to a high technology common rail injection engine
- A smaller footprint thanks to a high-power density
- Low temperature starting capability
- Long maintenance interval

Alternator

- Provide industry leading motor starting capability
- Excitation system to permit sustained overcurrent > 300% In, during 10 sec
- Built with a class H insulation and IP23

Cooling

- A flexible solution using an electrical driven radiator fan
- High temperature and altitude product capacity available

Control Panel

- The KOHLER SDMO wide controller range provide the reliability and performances you expect from your equipment. You can program, manage and diagnose it easily and in an efficient way

KOHLER SDMO worldwide support

- A standard three-year or 1000-hour limited warranty for standby applications.
- A standard two-year or 8700-hour limited warranty for prime power applications.
- A worldwide product support

GENERAL SPECIFICATIONS	
Engine type	KOHLER KD103V20
Alternator choices	KH09720T KH10861T
Voltage (V)	11000
Standard Control Panel	M80-D, APM802
Consumption @4500kVA ESP (L/h)	830
Consumption @4090kVA PRP (L/h)	746
Engine optimization	Fuel optimization
Type of Cooling	Electrical driven fan
Performance class	G3
One step load acceptance (out of ISO criteria)	100%

DIMENSIONS COMPACT VERSION WITH ALTERNATOR KH09720T AND WITHOUT COOLING	
Length (mm)	6779
Width (mm)	2248
Height (mm)	2829
Tank capacity (L)	0
Dry weight (kg)	26100

GENERATOR SET RATINGS

Alternator reference	Voltage	Gross rating (without cooling) or Net rating (with cooling)	Standby Rating Depending on alternator T° rise									Data Center Mission Critical Rating Depending on alternator T° rise										Prime Rating Depending on alternator T° rise				
			Class H					Class F				Class H					Class F					Class H			Class F	
			163°C/27°C			150°C/40°C		143°C/27°C		130°C/40°C		163°C/27°C			150°C/40°C		143°C/27°C		130°C/40°C			125°C/40°C			105°C/40°C	
			kWe	kVA	Amps	kWe	kVA	kWe	kVA	kWe	kVA	kWe	kVA	Amps	kWe	kVA	kWe	kVA	kWe	kVA		kWe	kVA	Amps	kWe	kVA
KH09720T	11000/6350V	Gross	3600	4500	236	3520	4400	3456	4320	3392	4240	3600	4500	236	3520	4400	3456	4320	3392	4240		3272	4090	215	3200	4000
		Net with elec cooling	*3480*	*4350*	*228*	*3400*	*4250*	*3336*	*4170*	*3272*	*4090*	*3480*	*4350*	*228*	*3400*	*4250*	*3336*	*4170*	*3272*	*4090*		*3160*	*3950*	*207*	*3080*	*3850*
KH10861T	11000/6350V	Gross	3680	4600	241	3680	4600	3680	4600	3680	4600	3680	4600	241	3680	4600	3680	4600	3680	4600		3344	4180	219	3344	4180
		Net with elec cooling	*3560*	*4450*	*234*	*3560*	*4450*	*3560*	*4450*	*3560*	*4450*	*3560*	*4450*	*234*	*3560*	*4450*	*3560*	*4450*	*3560*	*4450*		*3224*	*4030*	*212*	*3224*	*4030*

Reference Conditions: 25°C Air Inlet Temperature, 40°C Fuel Inlet Temperature, 100 kPa Barometric Pressure; 10.7 g/kg of dry air Humidity. Intake Restriction set to maximum allowable limit for clean filter; Exhaust Back pressure set to maximum allowable limit.
Data was taken from a single engine test according to the test methods, fuel specification and reference conditions stated above and is subjected to instrumentation and engine-to-engine variability. Test conducted with alternate test methods, instrumentation, fuel or reference conditions can yield different results. Data and specifications subject to change without notice.

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Engine

General	
Engine brand	KOHLER KD Series
Engine reference*	KD103V20-5CFS
Air inlet system	Turbo
Fuel	Diesel Fuel
Engine optimization	Fuel optimization
Cylinders configuration	V
Number of cylinders	20
Displacement (L)	103.43
Bore (mm) * Stroke (mm)	175 * 215
Compression ratio	16 : 1
Speed (RPM)	1500
Maximum stand-by power at rated RPM (kW)	3800
Piston type & material	Steel
Charge Air coolant	Air/Water
Frequency regulation, steady state (%)	+/- 0.25%
Injection Type	Direct
Governor type	Electronic
Air cleaner type, models	Dry

Fuel system	
Maximum fuel pump flow (L/h)	1200
Fuel Inlet Minimum recommended size (mm)	TBC
Fuel Outlet Minimum recommended size (mm)	TBC
Max head on fuel return line (m)	3.50
Maximum allowed inlet fuel temperature (°C)	70

Engine specific fuel consumption	PRP engine	ESP engine
Consumption @ 100% load (g/kWh)	187	190
Consumption @ 75% load (g/kWh)	190	189
Consumption @ 50% load (g/kWh)	202	199
Consumption @ 25% load (g/kWh)	231	226

Lubrication System	
Oil system capacity including filters (L)	700
Min. oil pressure (bar)	3.7
Max. oil pressure (bar)	11
Oil sump capacity (L)	575
Oil consumption @100% ESP(L/h)	1.69

Air Intake system	
Max. intake restriction (mm H2O)	510
Intake air flow (L/s)	4787

Exhaust system	PRP engine	ESP engine
Heat rejection to exhaust (kW)	2280	2540
Exhaust gas temperature (°C)	465	460
Exhaust gas flow (L/s)	10969	12339
Max. exhaust back pressure (mm H2O)	850	

Optional cooling system (HT/LT)	
Type of coolant	GENCOOL
Radiated heat to ambiant (kW)	160
Heat rejection to coolant HT (kW)	1200
Flow on the HT circuit at 0.7Bars pressure drop off engine (L/min)	1950
Outlet coolant temperature (°C)	95
Coolant capacity HT, engine only (L)	295
Max coolant temperature, Shutdown (°C)	103
Restriction pressure drop off engine – HT circuit (mbar)	700
Minimal pressure before HT pump (mbar)	400
Max. pressure at inlet of HT water pump (mbar)	2500
Thermostat begin of opening HT (°C)	71
Thermostat end of opening HT (°C)	81
HT Standard pressure cap setting (kPa)	100
Heat rejection to coolant LT (kW)	1010
Flow on the LT circuit at 0.7Bars pressure drop off engine (L/min)	650
Temperature of inlet to LT engine water circuit (°C)	55
Coolant capacity LT, engine only (L)	105
Restriction pressure drop off engine – LT circuit (mbar)	700
Minimal pressure before LT pump (mbar)	400
Max. pressure at inlet of LT water pump (mbar)	2500
LT Standard pressure cap setting (kPa)	100

** : Engine reference may be partially modified depending on genset application, options selected by the customer and lead time required.*

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Alternator Specifications	
Alternator choices	KH09720T KH010861T
Number of pole	4
Number of bearing	Double Bearing
Technology	Brushless
Indication of protection	IP23
Insulation class	H
Number of wires	06
Winding pitch	2/3
Capacity for maintaining short circuit at 3 In for 10 s	Yes
AVR Regulation	Yes
Coupling	Semi-elastic
Application data	
Overspeed (rpm)	2250
Power factor (Cos Phi)	0.80
Voltage regulation at established rating (+/- %)	0.50
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Total Harmonic Distortion in no-load DHT (%)	<3.5
Total Harmonic Distortion, on linear load DHT (%)	<3.5
Recovery time (Delta U = 20% transcient) (ms)	500
Unbalanced load acceptance ratio (%)	8

Alternator Standard Features

- All models are brushless, rotating-field alternators
- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting
- The AVR voltage regulator provides superior short circuit capability
- Self-ventilated and dip proof construction
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds
- Superior voltage waveform

Note: See Alternator Data Sheets for alternator application data and ratings, efficiency curves, voltage dip with motor starting curves, and short circuit decrement curves.

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Dimensions compact version

Alternator reference	Length (mm)	Width (mm)	Height (mm)	Dry Weight (kg)	Tank capacity (L)
KH09720T	6779	2248	2829	26100	0
KH10861T	6786			26600	

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M80-D

The M80-D can be used as a basic terminal block for connecting a control unit and as an instrument panel with a highly intuitive LCD screen giving an overview of your generating set's basic parameters:

- Oil gauge
- Coolant temperature
- Oil temperature
- Engine speed
- Battery voltage
- Charge air temperature
- Fuel consumption
- etc.

The engine main functions can be controlled and events are recorded to facilitate diagnostics:

- Starting
- Speed adjustment
- Stopping
- Droop
- etc.

APM802

ADVANCED POWER PLANT MANAGEMENT CONTROL
Dedicated to power plant management APM802 provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility

- Graphic display with touchscreen
- User language selectable
- Specially researched ergonomics
- High level of equipment availability
- USB and Ethernet ports
- Modbus protocol
- Making it easy to extend the installation
- Complies with the international standard IEC 61131-3

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STANDARD SCOPE OF SUPPLY

All our KD Series gensets are fitted with:

- Industrial water cooled DIESEL engine
- Electric starter & charge alternator 24 V D.C
- Electronic governor
- Standard air filter
- alternator IP 23 insulation class H
- Welded steel base frame
- M80-D control panel
- Flexible fuel lines & lub oil drain pump
- Fuel water separator filter
- Exhaust outlet with flexible and flanges
- User's manual (1 copy)
- Packing under plastic film
- Delivered with oil

CODES AND STANDARDS

Engine-generators set is designed and manufactured in facilities certified to standards ISO9001:2015 & ISO14001:2015. The generator sets and its components are prototype-tested, factory built and production tested and are in compliance with the relevant standards:

- Machinery Directive 2006/42/EC of May 17th 2006
- EMC Directive2014/30/UE
- Safety objectives set out in the Low Voltage Directive 2014/35/UE
- EN ISO 8528-13, EN 60034-1, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 55011, EN 1679-1 et EN 60204-1

TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Intlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30% relative humidity. For particular conditions in your installation, refer to the derating table.

WARRANTY INFORMATIONS

Standard Warranty Period:

- for Products in "back-up" service
  - 30 months from the date the Product leaves the plant, **extended to 42 months for KD series**
  - 24 months from the Product's commissioning date, **extended to 36 months for KD series**
  - 1,000 running hours

  The warranty expires when one of the above conditions is met.

- for Products in "continuous" service (continuous supply of electricity, either in the absence of any normal electricity grid or to complement the grid),
  - 18 months from the date the Product leaves the plant, **extended to 30 months for KD series**
  - 12 months from the Product's commissioning date, **extended to 24 months for KD series**
  - 2,500 running hours, **extended to 8700 running hours for KD series**

  The warranty expires when one of the above conditions is met.

For more details regarding conditions of application and scope of the warranty please refer to our General "terms & conditions of sales".

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