DDM 180

Technical Data

Diesel-Driven
Ground Power Unit

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1 Technical Data

1.1 General Data

	DDM 180, Diesel Ground Power Unit	
Nominal output	180	kVA
Nominal current	520	A
Voltage	200 / 115	VAC
Frequency	400	Hz
Power factor	0,8 lagging to unity	
Phase sequence	ABC	
Altitude up to	1 000	m
Ambient temperature	-20 to +52	°C
	With pre-heating -32 to +52	°C
Humidity	Up to 95	%
Sound level	~75	dBA
Weight	~ 2 900	kg
Protection system	TN	
	Optionally IT	
Protection class	IP 54	
Voltage regulation static	1,5	%
Voltage regulation dyn. (100 % load change, 10 m cable)	± 22	%
Recovery time	≤ 250	msec.
Voltage sensing	2 phase	
Frequency regulation static	± 0,5	%
Frequency regulation dyn. (30 % load change)	3,75	%
Recovery time	≤	sec.
Radio interference suppression	N acc. to VDE 0875	
	A acc. to VDE 0871	
	EN Standard	
Overloads	acc. to ISO 6858:2017(E)	
	80% load	Continuous with PF 0,8-1,0
	100% load	Continuous with PF 0,7-0,8
	100% load	5 minutes with PF 0,8-1,0

2 Diesel Engine Stage IIIA – DEUTZ TCD 2013

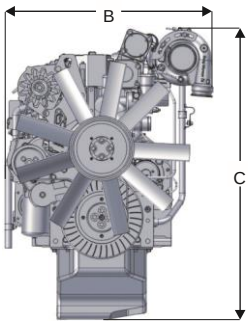
2.1 Characteristics of the DEUTZ TCD 2013 L6 4V

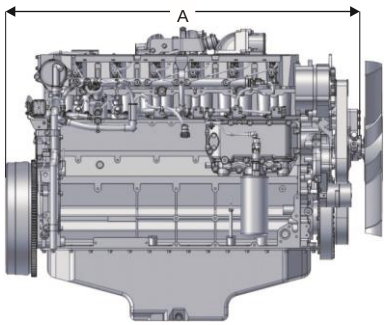
- Water-cooled 6-cylinder inline engine with turbocharging and charge air cooling.
- The powerful DEUTZ Common Rail (DCR®) injection system and the electronic engine control (EMR) with intelligent link to the drive management ensure optimum engine performance at low fuel consumption.
- Best cold starting performance even under extreme conditions.
- Low noise emissions due to acoustically optimized components with very smooth running and high durability.
- Wet cylinder liners, long oil change intervals and easy changing of the engine fluids reduce the running and service cost and increase the availability of the machinery.
- The robust design allows worldwide operation even with high sulphur fuels.
- Electronic motor regulator (EMR) to allow easy integration into the electronic device control and monitoring system.

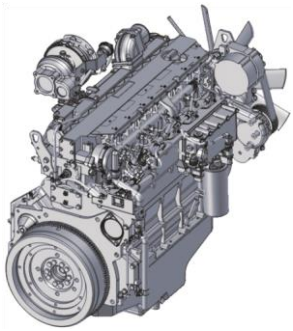
2.2 Technical Data

	Diesel engine, DEUTZ TCD 2013 L6 4V	
Diesel engine manufacturer	DEUTZ	
Type	TCD 2013 L6 4V	
Operation	4-stroke	
Aspiration	turbo charger	
Cylinders / Form	in line	
Altitude	1 000	m
Ambient temperature	-20 to +52	°C
	With pre-heating -32 to +52	°C
Humidity	Up to 95	%
Continuous output power	224	kW
acc. ISO 14396	(238	kW @ 2200 rpm)
Speed	1 846	min^{-1}
Bore / Stroke	108 / 130	mm
Displacement	7,2	l
Specific fuel consumption	204	g/kWh
Lubrication oil consumption (as % of full load fuel consumption)	0,3	%
Lubrication oil capacity (sump)	~20	l
Battery System	24	VDC
Governor	EMR3	
Weight as per DIN 70020 Part 7A	660	kg

2.3 Dimensions







Engine type		A	B	C
TCD 2013 L6 4V	mm	1158	703	974

Figure 1 Engine Dimensions

2.4 Characteristic curves

TCD 2013 L6 4V

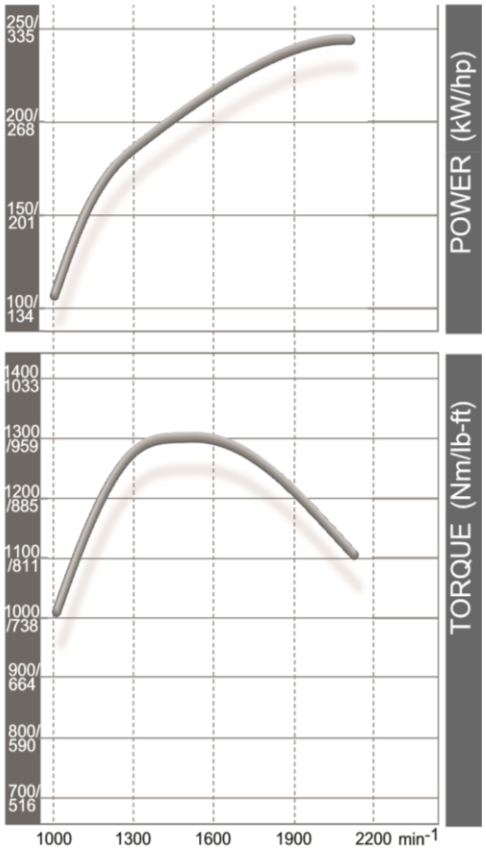


Figure 2 Characteristic curves of the DEUTZ TCD 2013 L6 4V

2.5 Engine description

Cycle:	liquid cooled 4-stroke diesel engine with direct injection, single-acting, turbocharged by exhaust turbocharger, with charge air cooler (air/air)
Rotation:	anti-clockwise rotation when facing flywheel
Cylinder arrangement:	vertical in line
Cylinder:	wet liners
Cylinder head:	block-type, made of grey cast iron
Valve arrangement:	overhead valves, one/two inlet and one/two outlet valve per cylinder
Valve control:	by camshaft mounted in crankcase on two-layer bearings via tappets and pushrods
Camshaft drive:	from crankshaftvia straight-, high cut spur gears
Crankcase material:	grey cast iron
Crankshaft bearing:	crankshaft mounted after each throw on two-layer bearings there of 1 as thrust bearing with 2 thrust rings
Con rod bearing – big end:	three/four -layer bearing
Lubrication:	forced feed lubrication
Lube oil filter:	1 cartridge in main circuit
Injection pump:	2 high pressure pumps to rail
Injection nozzle:	7-hole injection nozzle, in injector
Governor:	Electronic governor (EMR)
Fuel feed pump:	External gear pump in belt drive
Number of cylinders:	6
Bore:	108 mm
Stroke:	130 mm
Cylinder distance:	132 mm
Swept volume per cylinder:	1191 cm^3
Total displacement:	7146 cm^3
Compression ratio:	1 : 18,1
Lube oil consumption:	0,1 % (full load lube oil consumption of a new, fully run-in engine in % of the full load fuel consumption at rated speed)

2.6 Scope of supply

Engine:
- Turbo charger
- Flywheel with housing
- Engine
- Poly-V belt drive with protection

Cooling system:
- Cooling pump
- Thermostat
- External cooling system with cooling water shortage level switch

Fuel system:
- Fuel filter
- Fuel / water separator
- Flexible connection pipes
- Separate fuel injection pumps

Regulation:
- Actuator, pick up, EMR3 speed regulator
- Starting cloud limitation
- With following protection & supervision elements: over speed, oil pressure, coolant temperature, coolant level, intercooler air temperature
- Electronic speed regulation (DEUTZ EMR3)

Lubrication and oil level system:
- Lubrication oil cooler
- Circulation lub with lubrication oil filter including first filling with motor oil, a standard oil drain valve is installed

Air intake:
- Air filter mounted with under pressure contact and indication

Emissions:
- The engine meet the requirements of the emission stage COM IIIA

Engine starting:
- Temperature sensor for EMR regulator to prevent extra fuel at warm start
- Separate pick up for cranking and over speed protection
- Automatically temperature optimized starting ramp

Electric equipment:
- Charging alternator 28 V / 100 A
- Automatic shut down in case of oil pressure failure and motor temperature failure
- Electric starter 24 V / 5 kW

Colour:
- RAL 7015 (slate grey)

3 400 Hz synchronous alternator

The highly efficient 3-phase synchronous alternator generates a voltage of 200 / 115 V with a frequency of 400 Hz. It has a single bearing, is self-excited, runs with 1846 rpm, and is designed and developed in Austria.

In order to cope with unbalanced loads, the alternator uses damper windings. Banding and winding supports secure the rotor coils against centrifugal forces. To be protected against thermal stresses and harshest environmental conditions, the windings are insulated.

	400 Hz synchronous alternator	
Manufacturer	Dynell	
Type	DSA180	
Nominal output	180	kVA
Nominal current	520	A
Voltage	200 / 115	V
Power factor	0,8 lagging to unity	
Efficiency	92	%
Connection	Star	
Frequency	400	Hz
Speed	1 846	rpm
Voltage constancy static	± 1,5	%
Voltage adjustment	± 15	%
Voltage modulation	≤ 3	V
Phase position at balanced load	119 – 121	
Phase position at 30% unbalanced load	110 – 130	
Total harmonic content	≤	%
Single harmonic content	≤	%
Form	B3	
Operation	S1	
Enclosure	IP 21	
Insulation class	F	
Temperature rise according to	F	
Design according to	VDE0530 and IEC34	

Based on a balanced mix of knowledge, experience and innovation, we design, build, distribute and maintain aviation ground support and charging equipment around the globe. Our ground-breaking ideas generate the greatest possible customer value for future markets.

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