Sales Program Oil & Gas Industry

Diesel Engines for Generator and Mechanical Drive

Edition 1/16
valid from 03/2016

Power. Passion. Partnership.

MTU.
Cutting-edge technology.
Customized solutions.
Reliability in all conditions.

MTU is the core brand of Rolls-Royce Power Systems AG, which is a world-leading provider of high- and medium-speed diesel and gas engines, complete drive systems, distributed energy systems and fuel injection systems for the most demanding requirements.

Developed specially for the oil and gas industry, our engines and systems for drive solutions, such as generators, pumps, compressors and fire suppression systems, prove their worth worldwide day after day in tough conditions.

Based on its innovative capabilities, reliability and system competence, MTU utilizes unique drive system know-how and offers a large range of excellent quality products. Together with MTU's full product and customer services the benefit is yours, because highest availability is at your disposal, no matter where you are based.

A network of affiliates, agencies and support centers that spans the whole world as well as a large force of customer service specialists trained by MTU assures expert service and provides the best maintenance to our engines that meets with the highest level of demands – 24 hours a day.

1 Achilles

2 FPAL

3 ISO 9001:2008

4 BS OHSAS 18001:2007

5 Lloyd's Register for Series 2000P

6 Lloyd's Register for Series 4000P

1


Achilles JQS
Joint Qualification System
Certificate of Qualification
Awarded to
MTU FRIEDRICHSHAFEN GMBH

2


Certificate of Registration

3


CERTIFICATE
MTU Friedrichshafen GmbH
ISO 9001 : 2008

4


Certificate
BS OHSAS 18001:2007
LGA InterCert

5


Lloyd's Register
Type Approval Certificate Extension

6


Lloyd's Register
Type Approval Certificate

General specifications

Diesel engines for the Oil & Gas industry for
- Generator drive with constant speed
- Mechanical drive with variable speed
> Four-stroke, direct injection
> Liquid and air cooled
> V or In-line configuration

Power Definition
Rated power of diesel engines in this Sales Program corresponds to ISO 3046
ICFN = ISO standard (continuous) fuel stop power
ICXN = ISO standard (continuous) power exceedable by 10%
IFN = ISO standard fuel stop power
(ratings also apply to SAE J1995 and J1349 standard conditions)

Emission Qualifications:
EU Nonroad directive 97/68 EC
EPA-US nonroad regulation 40 CFR 89, 40 CFR 1039
EPA-US Stationary EMERG regulation 40 CFR 60
IMO International Maritime Organization (MARPOL)
MoEF India/CPCB
China Onroad GB17691-2005
China NRMM GB20981-2014
NEA Singapore for ORDE
US-EPA GHG14 On-Highway

Standard conditions for diesel engines:

Barometric pressure:	1000 mbar;
Site altitude above sea level:	100 m
Ambient air temperature:	25°C (77°F)

Charge-air coolant temperature for generator drive:

Series 2000	55°C (131°F) for fuel consumption or TA-Luft optimized, 45°C (113°F) for emission optimized
Series 4000	55°C (131°F) for fuel consumption or TA-Luft optimized, 45°C (113°F) for emission optimized
Series 2000 Px2	45°C (113°F)
Series 4000 Px1	55°C (131°F)
Series 4000 Px3	45°C (113°F)

Charge-air coolant temperature for mechanical drive:

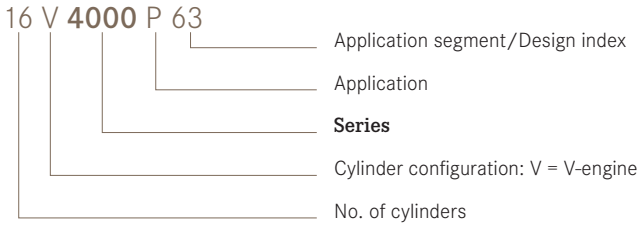
Series 2000	45°C (113°F)
Series 4000 Sx3/Tx4/T5	45°C (113°F)
Series 4000 Px1	55°C (131°F)

Information about further technical data and classificatin requirements e.g. DNV, ABS, RS, BV, LR, GL and ATEX Zone 2 are available on request.

MTU applies a policy of continual products and systems improvements. Please note, specifications are subject to change without notice. All dimensions are approximate. Details are subject to options selected. Please contact your MTU distributor for current information and binding data.

Explanation of the engine designation

Series 460, 500, 900, 1000, 1100, 1300, 1500, 1600, 2000, 4000
Example:



Series	60/460/500/900/1000/1100/1300/1500/1600/2000/4000
Cooling variants	
Separate circuit charge cooling	1600/2000/4000
Air-to-air charge air cooling	60/460/500/900/1000/1100/1300/1500/2000
External water charge air cooling	2000/4000

For further information about MTU Oil & Gas products please contact your distributor/dealer or visit: www.mtu-online.com

Selection Guideline
Typical Applications

3A/50 Hz - Diesel engines for continuous power	**498 kW - 2245 kW**	
Rating definition: Continuous operation - 100% Load	Load factor ≤ 100%	
Prime power for electrical equipment on drilling rigs, production facilities and compression stations where electrical power from a utility is not available.		
Operating hours: unrestricted	Rating definition: ICXN, 10% overload capability	Page 18 - 19
3B/50 Hz - Diesel engines for prime power	**249 kW - 2600 kW**	
Rating definition: Continuous operation - variable Load	Load factor < 75%	
Prime power for electrical equipment on drilling rigs, production facilities and compression stations where electrical power from a utility is not available.		
Operating hours: unrestricted	Rating definition: ICXN, 10% overload capability	Page 20 - 23
3C/50 Hz - Diesel engines for prime power limited	**575 kW - 2600 kW**	
Rating definition: Standby operation - variable Load	Load factor < 75%	
Stand by power for drilling rigs, production facilities and compression stations for use in situations where prime power is not needed or is not available.		
Operating hours: max. 1000 hours per year	Rating definition: ICXN, 10% overload capability	Page 24 - 25

Engine for constant speed mechanical drives are available upon request. Please consult your distributor.

Selection Guideline
Typical Applications

3A/60 Hz - Diesel engines for continuous power	**600 kW - 2425 kW**	
Rating definition: Continuous operation - 100% Load	Load factor ≤ 100%	
Prime power for electrical equipment on drilling rigs, production facilities and compression stations where electrical power from a utility is not available.		
Operating hours: unrestricted	Rating definition: ICXN, 10% overload capability	Page 26 - 27
3B/60 Hz - Diesel engines for prime power	**284 kW - 2800 kW**	
Rating definition: Continuous operation - variable Load	Load factor < 75%	
Prime power for electrical equipment on drilling rigs, production facilities and compression stations where electrical power from a utility is not available.		
Operating hours: unrestricted	Rating definition: ICXN, 10% overload capability	Page 28 - 31
3C/60 Hz - Diesel engines for prime power limited	**695 kW - 2800 kW**	
Rating definition: Standby operation - variable Load	Load factor < 75%	
Stand by power for drilling rigs, production facilities and compression stations for use in situations where prime power is not needed or is not available.		
Operating hours: max. 1000 hours per year	Rating definition: ICXN, 10% overload capability	Page 32 - 33

Engine for constant speed mechanical drives are available upon request. Please consult your distributor.

Selection Guideline
Typical Applications

4A - Diesel engines for heavy duty operation	**75 kW - 1865 kW**	
Rating definition: Continuous operation - 100% Load	Load factor > 60%	
Mechanical power for draw works, mudpumps, cementers, sanding units, and workover rigs.		
Operating hours: unrestricted	Rating definition: Fuel stop, ICFN	Page 36 - 45
4B - Diesel engines for medium duty operation	**110 kW - 2023 kW**	
Rating definition: Continuous operation - variable Load	Load factor < 60%	
Mechanical power for draw works, mudpumps, hydration units, sanding units, blenders, cranes and workover rigs.		
Operating hours: unrestricted	Rating definition: Fuel stop, ICFN	Page 46 - 55
4C - Diesel engines for short time duty operation	**447 kW - 2320 kW**	
Rating definition: Short-time operation - variable Load	Load factor > 60%	
Mechanical power for coil tubing units, nitrogen units, and fire pumps.		
Operating hours: max. 1000 hours per year	Rating definition: Fuel stop, ICFN	Page 56 - 61
4D - Diesel engines for frac operation	**858 kW - 2461 kW**	
Rating definition: Continuous operation - low Load	Load factor < 40%	
Mechanical power for frac pumps		
Operating hours: max. 2000 hours per year	Rating definition: Fuel stop, ICFN	Page 62 - 63
MTU Systeme	**350 kW - 1939 kW**	
Electric Drilling Package (EDP)		Page 66 - 67
MTU FracPack		Page 68 - 69

Engines for vehicle main drive applications (MTU Application group 5) are available upon request. Please consult your distributor.

Diesel engines for generator drive

Photo: Øyvind Hagen/Statoil

Diesel engines for generator drive

1500 rpm - 50 Hz
498 kW - 2245 kW
(668 bhp - 3010 bhp)

> Series 18V 2000 G65 without power reduction available up to 35°C/400m

3A/50 Hz – Continuous power

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization	Cooling Variant	Cooling pack. included
	kW	bhp			
12V 2000 P62[1)]	498	668	⑥	W2A	
12V 2000 G65	515	691	☒	A2A	✓
16V 2000 G65	655	878	☒	A2A	✓
16V 2000 P62[1)]	664	890	⑥	W2A	
18V 2000 G65	720	966	☒	A2A	✓
12V 4000 P61[1)]	1140	1529	⑥	W2A	
12V 4000 P63[1)]	1350	1809	⑱	W2A	
16V 4000 P61[1)]	1520	2038	⑥	W2A	
16V 4000 P63[1)]	1800	2412	⑱	W2A	
20V 4000 P63[1)]	2245	3010	⑱	W2A	

Optimization: ☒ Fuel consumption optimized
⑥ IMO I
⑱ IMO II

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds and turbochargers

Diesel engines for generator drive

1500 rpm - 50 Hz
249 kW - 770 kW
(334 bhp - 1033 bhp)

3B/50 Hz – Prime power

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization	Cooling Variant	Cooling pack. included
	kW	bhp			
6R 1600 G10F	**249**	**334**	☒①⑧㉔㉕	A2A	✓
6R 1600 G20F	**274**	**367**	☒①⑧㉔㉕	A2A	✓
8V 1600 G10F	**325**	**436**	☒①⑧㉔㉕	A2A	✓
8V 1600 G20F	**358**	**480**	☒①⑧㉔㉕	A2A	✓
10V 1600 G10F	**407**	**546**	☒①⑧㉔㉕	A2A	✓
10V 1600 G20F	**448**	**601**	☒①⑧㉔㉕	A2A	✓
12V 1600 G10F	**524**	**703**	☒①㉔	A2A	✓
12V 2000 P62[1)]	**575**	**771**	⑥	W2A	
12V 1600 G20F	**576**	**772**	☒①㉔	A2A	✓
12V 2000 G25	**580**	**778**	☒①	A2A	✓
12V 2000 G25	**580**	**778**	☒	W2A	
12V 2000 G65	**695**	**932**	☒①	A2A	✓
16V 2000 P62[1)]	**770**	**1033**	⑥	W2A	

Optimization: ☒ Fuel consumption optimized
① TA-Luft optimized (Diesel)
⑥ IMO I
⑧ EU Nonroad St IIIA (97/68/EC)
㉔ NEA Singapore for ORDE
㉕ MoEF India/ CPCB Stage II

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds ans turbochargers

Diesel engines for generator drive

1500 rpm - 50 Hz
890 kW - 2600 kW
(1194 bhp - 3487 bhp)

> Series 18V 2000 G65 for fuel consumption optimized without power reduction available up to 35°C/400m
> Series 20V 4000 G63L without power reduction available up to 30°C/400m

3B/50 Hz – Prime power

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization	Cooling Variant	Cooling package
	kW	bhp			
16V 2000 G65	**890**	**1194**	☒①	A2A	✓
18V 2000 G65	**1000**	**1341**	☒①	A2A	✓
12V 4000 G23R	**1205**	**1616**	☒①㉔	W2A	
12V 4000 P61[1)]	**1320**	**1770**	⑥	W2A	
12V 4000 G23	**1420**	**1904**	☒①㉔	W2A	
12V 4000 P63[1)]	**1560**	**2090**	⑱	W2A	
16V 4000 P61[1)]	**1760**	**2360**	⑥	W2A	
16V 4000 G23	**1798**	**2411**	☒①㉔	W2A	
16V 4000 G63	**1965**	**2635**	☒①㉔	W2A	
16V 4000 P63[1)]	**2080**	**2787**	⑱	W2A	
20V 4000 G63L	**2590**	**3473**	☒①㉔	W2A	
20V 4000 P63[1)]	**2600**	**3487**	⑱	W2A	

Optimization: ☒ Fuel consumption optimized
① TA-Luft optimized (Diesel)
⑥ IMO I
⑱ IMO II
㉔ NEA Singapore for ORDE

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds and turbochargers

Diesel engines for generator drive

1500 rpm - 50 Hz
575 kW - 2600 kW
(771 bhp - 3487 bhp)

3C/50 Hz – Prime power limited

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization	Cooling Variant	Cooling package
	kW	bhp			
12V 2000 P62[1)]	**575**	**771**	⑥	W2A	
16V 2000 P62[1)]	**770**	**1033**	⑥	W2A	
12V 4000 P61[1)]	**1320**	**1770**	⑥	W2A	
12V 4000 P63[1)]	**1560**	**2092**	⑱	W2A	
16V 4000 P61[1)]	**1760**	**2360**	⑥	W2A	
16V 4000 P63[1)]	**2080**	**2789**	⑱	W2A	
20V 4000 P63[1)]	**2600**	**3487**	⑱	W2A	

Optimization: ⑥ IMO I
⑱ IMO II

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds and turbochargers

Diesel engines for generator drive

1800 rpm - 60 Hz
600 kW - 2425 kW
(805 bhp - 3252 bhp)

3A/60 Hz – Continuous power

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization	Cooling Variant	Cooling pack. included
	kW	bhp			
12V 2000 P82[1)]	600	805	⑱⑲	W2A	
16V 2000 P82[1)]	800	1073	⑱⑲	W2A	
12V 4000 G73[2)]	870	1167	⑲	W2A	
16V 4000 G73[2)]	1140	1529	⑲	W2A	
12V 4000 P81[1)]	1380	1851	⑥	W2A	
12V 4000 P83[1)]	1455	1951	⑱⑲	W2A	
16V 4000 G43	1680	2253	☒	W2A	
16V 4000 P81[1)]	1840	2467	⑥	W2A	
16V 4000 P83[1)]	1940	2601	⑱⑲	W2A	
20V 4000 P83[1)]	2425	3252	⑱	W2A	

Optimization: ☒ Fuel consumption optimized
⑥ IMO I
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)

1) Engines are designed with water cooled exhaust manifolds and turbochargers
2) with 1200 rpm

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

Diesel engines for generator drive

1800 rpm - 60 Hz
284 kW - 980 kW
(381 bhp - 1314 bhp)

> Series 12V 2000 G85 without power reduction available up to 35°C/400m

3B/60 Hz – Prime power

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization	Cooling Variant	Cooling pack. included
	kW	bhp			
6R 1600 G10S	**284**	**381**	⑳	A2A	✓
6R 1600 G20S	**312**	**418**	⑦⑳	A2A	✓
8V 1600 G20S	**408**	**547**	⑦⑳	A2A	✓
10V 1600 G10S	**465**	**624**	☒	A2A	✓
10V 1600 G20S	**511**	**685**	③⑲	A2A	✓
12V 1600 G10S	**561**	**752**	⑲	A2A	✓
12V 1600 G20S	**608**	**815**	⑲	A2A	✓
12V 2000 P82[1)]	**695**	**932**	⑱⑲	W2A	
12V 2000 G45	**710**	**952**	③⑲	W2A	
16V 2000 G56S	**809**	**1085**	⑯	W2A	
12V 2000 G85	**810**	**1086**	③⑲	A2A	✓
12V 2000 G85	**810**	**1086**	③⑲	W2A	
16V 2000 P82[1)]	**930**	**1247**	⑱⑲	W2A	
16V 2000 P82L[1)]	**980**	**1314**	⑱	W2A	

Optimization: ☒ Fuel consumption optimized
③ EPA Stationary EMERG T2 (40CFR60)
⑦ EPA Stationary EMERG T3 (40CFR60)
⑯ EPA Nonroad T4i (40CFR1039)
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)
⑳ EPA Nonroad T3 Comp (40CFR89)

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds and turbochargers

Diesel engines for generator drive

1800 rpm - 60 Hz
1010 kW - 2800 kW
(1354 bhp - 3755 bhp)

3B/60 Hz – Prime power

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization	Cooling Variant	Cooling package
	kW	bhp			
16V 2000 G85	**1010**	**1354**	③⑲	A2A	✓
16V 2000 G85	**1010**	**1354**	③⑲	W2A	
12V 4000 G73[2)]	**1105**	**1482**	⑲	W2A	
16V 4000 G73[2)]	**1390**	**1864**	⑲	W2A	
12V 4000 G43	**1520**	**2038**	☒③⑲	W2A	
12V 4000 P81[1)]	**1600**	**2146**	⑥	W2A	
12V 4000 P83[1)]	**1680**	**2253**	⑱⑲	W2A	
12V 4000 G83	**1736**	**2328**	☒③⑲	W2A	
16V 4000 G43	**2020**	**2709**	☒③⑲	W2A	
16V 4000 P81[1)]	**2105**	**2823**	⑥⑲	W2A	
16V 4000 P83[1)]	**2240**	**3004**	⑱⑲	W2A	
20V 4000 P83[1)]	**2800**	**3755**	⑱⑲	W2A	

Optimization: ☒ Fuel consumption optimized
③ EPA Stationary EMERG T2 (40CFR60)
⑥ IMO I
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

1) Engines are designed with water cooled exhaust manifolds and turbochargers
2) with 1200 rpm

Diesel engines for generator drive

1800 rpm - 60 Hz
695 kW - 2800 kW
(932 bhp - 3755 bhp)

3C/60 Hz – Prime power limited

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization	Cooling Variant	Cooling package
	kW	bhp			
12V 2000 P82[1)]	**695**	**932**	⑱	W2A	
16V 2000 P82[1)]	**930**	**1247**	⑱	W2A	
16V 2000 P82L[1)]	**980**	**1314**	⑱	W2A	
12V 4000 P81[1)*]	**1600**	**2145**	⑥	W2A	
12V 4000 P83[1)]	**1680**	**2253**	⑱⑲	W2A	
16V 4000 P81[1)]	**2105**	**2820**	⑥	W2A	
16V 4000 P83[1)*]	**2240**	**3004**	⑱⑲	W2A	
20V 4000 P83[1)]	**2800**	**3755**	⑱⑲	W2A	

Optimization: ⑥ IMO I
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
W2A: Water-to-air charge air cooling (TB)

* available on request
1) Engines are designed with water cooled exhaust manifolds and turbochargers

Diesel engines for mechanical drive

Diesel engines for mechanical drive

75 kW - 350 kW (101 bhp - 469 bhp)

> Intake air temperature: 25°C

Mercedes-Benz Engineering Excellence

4A – Heavy duty operation

Engine model	Rated power			Cooling	Peak Torque			Optimization
	ICFN			Variant				
	kW	bhp	rpm		Nm	lb-ft	rpm	
4R 904 C21	**75**	**101**	2200	A2A	400	295	1200-1600	⑳㉓㉛*
4R 904 C31	**90**	**121**	2200	A2A	470	345	1200-1600	⑳㉓㉛*
4R 924 C22	**95**	**127**	2200	A2A	500	370	1200-1600	㊳㊴
6R 906 C21	**130**	**174**	2200	A2A	675	500	1200-1600	⑳㉓㉛*
6R 906 C31	**150**	**201**	2200	A2A	750	555	1200-1600	⑳㉓㉛*
6R 926 C22	**175**	**234**	2200	A2A	850	625	1200-1600	㊳㊴
6R 926 C32	**195**	**261**	2200	A2A	1020	750	1200-1600	㊳㊴
6R 460 C11R	**220**	**295**	1800	A2A	1300	960	1300	⑳㉓㉛*
6R 460 C11	**242**	**324**	1800	A2A	1600	1180	1300	⑳㉓㉛*
6R 460 C21	**260**	**349**	1800	A2A	1750	1290	1300	⑳㉓㉛*
6R 460 C31	**295**	**396**	1800	A2A	1900	1400	1300	⑳㉓㉛*
6R 460 C22	**265**	**355**	1800	A2A	1750	1290	1300	㉙㊳㊴
6R 460 C32	**295**	**396**	1800	A2A	1900	1400	1300	㉙㊳㊴
6V 501 C31	**260**	**349**	1800	A2A	1730	1275	1300	⑳㉓㉛*
6V 501 C32	**265**	**355**	1800	A2A	1850	1365	1300	㊳㊴
8V 502 C21	**330**	**442**	1800	A2A	2150	1585	1300	⑳㉓㉛*
8V 502 C31	**350**	**469**	1800	A2A	2300	1695	1300	⑳㉓㉛*

Optimization:
⑳ EPA Nonroad T3 Comp (40CFR89)
㉓ EU Nonroad St IIIA Comp (97/68/EC)
㉙ China Onroad Stage V (GB17691-2005)
㉛* China NRMM Stage III (GB20981-2014) upon request
㊳ EPA Nonroad T4i Comp (40CFR1039)
㊴ EU Nonroad St IIIB Comp (97/68/EC)

All 4A-ratings can be used for 4B applications!

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

These engines are also available for vehicle main drive applications (MTU application group 5).

Diesel engines for mechanical drive

242 kW - 317 kW (325 bhp - 425 bhp)

4A – Heavy duty operation

Engine model	Reference no.	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
		kW	bhp	rpm			Nm	lb-ft	rpm
S60 (12.7 l)	6063MK74	298	400	2200	A2A	1830	1350	1350	⑤⑲
S60 (14.0 l)	6063HV39	242	325	2100	A2A	1559	1150	1350	⑳㉓㉛*
	6063HV39	280	375	2100	A2A	1830	1350	1350	⑳㉓㉛*
	6063HV39	298	400	2100	A2A	1958	1444	1350	⑳㉓㉛*
	6063HV39	317	425	2100	A2A	2000	1475	1350	⑳㉓㉛*

Optimization: ⑤ EU Nonroad St II Comp (97/68/EC)
⑲ EPA Nonroad T2 Comp (40CFR89)
⑳ EPA Nonroad T3 Comp (40CFR89)
㉓ EU Nonroad St IIIA Comp (97/68/EC)
㉛* China NRMM Stage III (GB20981-2014) upon request

<u>4A ratings can be used for 4B applications</u>

For additional power ratings please consult your MTU distributor/dealer.

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

These engines are also available for vehicle main drive applications (MTU application group 5).

Diesel engines for mechanical drive

100 kW - 400 kW (134 bhp - 536 bhp)

> Intake air temperature: 25°C

4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
4R 1000 C10	**100**	**134**	2200	A2A	600	443	1200-1500	㉑㉗
4R 1000 C20	**115**	**154**	2200	A2A	675	498	1200-1500	㉑㉗
4R 1000 C30	**129**	**173**	2200	A2A	750	553	1200-1600	㉑㉗
6R 1000 C20	**180**	**241**	2200	A2A	1000	738	1200-1600	㉑㉗
6R 1000 C30	**210**	**282**	2200	A2A	1150	848	1200-1600	㉑㉗
6R 1100 C30	**280**	**375**	1700	A2A	1900	1401	1300	㉑㉗
6R 1300 C20	**320**	**429**	1700	A2A	2100	1549	1300	㉑㉗
6R 1300 C30	**340**	**456**	1700	A2A	2200	1623	1300	㉑㉗
6R 1500 C30	**400**	**536**	1700	A2A	2600	1918	1300	㉑㉗

Optimization: ㉑ EPA Nonroad T4 (40CFR1039)
㉗ EU Nonroad St IV (97/68/EC)

All 4A-ratings can be used for 4B applications!

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

These engines are also available for vehicle main drive applications (MTU application group 5).

Diesel engines for mechanical drive

600 kW - 1760 kW (805 bhp - 2360 bhp)

4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 P12	**600**	**805**	1800	SCCC	3500	2580	1500	⑥
16V 2000 P12	**800**	**1073**	1800	SCCC	4770	3520	1425	⑥⑱⑲
12V 4000 P11 [1)]	**1320**	**1770**	1800	SCCC	8133	6000	1550	②⑥
16V 4000 P11 [1)]	**1760**	**2360**	1800	SCCC	10844	7995	1500	②⑥

[1)] Third party Certifications available on request

Optimization: ② EPA Nonroad T1 Comp (40CFR89)
⑥ IMO I
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)

Cooling Variant:
SCCC: Separate circuit charge air cooling

4A

Diesel engines for mechanical drive

567 kW - 1865 kW (760 bhp - 2500 bhp)

> Charge-air coolant temperature: 48°C (16V 2000 S12 @ 1800 rpm);
50°C (16V 2000 S12 @ 2100 rpm)

4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 S12	**567**	**760**	2100	SCCC	3300	2441	1350	⑲
16V 2000 S12	**783**	**1050**	1800/ 2100	SCCC	4450	3288	1350	⑲
12V 4000 S11R	**1193**	**1600**	1900	SCCC	7612/7595	5614/5602	1500	☒②
12V 4000 S11	**1286**	**1725**	1900	SCCC	6986	5151	1500	☒②
16V 4000 S11	**1343**	**1800**	1900	SCCC	8546	6400	1350	②
12V 4000 S21R	**1398**	**1875**	1900	SCCC	7612	5615	1500	☒②
12V 4000 S23	**1425**	**1910**	1800	SCCC	Please consult your distributor.			⑲
12V 4000 S21	**1510**	**2025**	1900	SCCC	8199	6074	1500	☒②
16V 4000 S21R	**1600**	**2146**	1800	SCCC	10188	7514	1500	②
16V 4000 S11L	**1715**	**2300**	1900	SCCC	9313	6869	1500	☒
16V 4000 S23	**1865**	**2500**	1800	SCCC	Please consult your distributor.			⑲

Optimization: ☒ Fuel consumption optimized
② EPA Nonroad T1 Comp (40CFR89)
⑲ EPA Nonroad T2 Comp (40CFR89)

Cooling Variant:
SCCC: Separate circuit charge air cooling

Diesel engines for mechanical drive

110 kW - 375 kW (147 bhp - 503 bhp)

> Intake air temperature: 25°C

Mercedes-Benz Engineering Excellence

mtu

4B – Medium duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
4R 904 C61	**110**	**147**	2200	A2A	580	430	1200-1600	⑳㉓㉛*
4R 904 C71	**129**	**173**	2200	A2A	675	500	1200-1600	⑳㉓㉛*
4R 924 C71	**145**	**194**	2200	A2A	750	555	1200-1600	⑳㉓㉛*
4R 924 C52	**115**	**154**	2200	A2A	610	450	1200-1600	㊳㊴
4R 924 C62	**129**	**173**	2200	A2A	675	500	1200-1600	㊳㊴
4R 924 C72	**150**	**201**	2200	A2A	800	590	1200-1600	㊳㊴
6R 906 C51	**170**	**228**	2200	A2A	810	595	1200-1600	⑳㉓㉛*
6R 906 C61	**190**	**255**	2200	A2A	1000	735	1200-1600	⑳㉓㉛*
6R 906 C71	**205**	**275**	2200	A2A	1100	810	1200-1600	⑳㉓㉛*
6R 926 C61	**220**	**295**	2200	A2A	1200	885	1200-1600	⑳㉓㉛*
6R 926 C71	**240**	**322**	2200	A2A	1300	960	1200-1600	⑳㉓㉛*
6R 926 C52	**210**	**281**	2200	A2A	1120	825	1200-1600	㉚㊳㊴
6R 926 C62	**225**	**302**	2200	A2A	1200	885	1200-1600	㉚㊳㊴
6R 926 C72	**240**	**322**	2200	A2A	1300	960	1200-1600	㉚㊳㊴
6R 460 C41	**315**	**422**	1800	A2A	2000	1475	1300	⑳㉓㉛*
6R 460 C51	**335**	**449**	1800	A2A	2000	1475	1300	⑳㉓㉛*
6R 460 C61	**360**	**483**	1800	A2A	2200	1620	1300	⑳㉓㉛*
6R 460 C71	**375**	**503**	1800	A2A	2200	1620	1300	⑳㉓㉛*
6R 460 C42	**315**	**422**	1800	A2A	2000	1475	1300	㉙㊳㊴
6R 460 C52	**335**	**449**	1800	A2A	2000	1475	1300	㉙㊳㊴
6R 460 C62	**360**	**483**	1800	A2A	2200	1620	1300	㉙㊳㊴
6R 460 C72	**375**	**503**	1800	A2A	2200	1620	1300	㊳㊴

Optimization:
⑳ EPA Nonroad T3 Comp (40CFR89)
㉓ EU Nonroad St IIIA Comp (97/68/EC)
㉙ China Onroad Stage V (GB17691-2005)
㉛* China NRMM Stage III (GB20981-2014) upon request
㊳ EPA Nonroad T4i Comp (40CFR1039)
㊴ EU Nonroad St IIIB Comp (97/68/EC)

These engines are also available for vehicel main drive applications (MTU application group 5).

Cooling Variant:

A2A: Air-to-air charge air cooling (TD)

4B

Diesel engines for mechanical drive

290 kW - 480 kW (389 bhp - 644 bhp)

> Intake air temperature: 25°C

Mercedes-Benz Engineering Excellence

mtu

4B – Medium duty operation

Engine model	Rated power			Cooling	Peak Torque			Optimization
	ICFN			Variant				
	kW	bhp	rpm		Nm	lb-ft	rpm	
6V 501 C51	**290**	**389**	1800	A2A	1850	1365	1300	⑳㉓㉛*
6V 501 C61	**315**	**422**	1800	A2A	2000	1475	1300	⑳㉓㉛*
6V 501 C52	**300**	**402**	1800	A2A	2000	1475	1300	㊳㊴
6V 501 C62	**320**	**429**	1800	A2A	2100	1550	1300	㊳㊴
6V 501 C72	**350**	**469**	1800	A2A	2300	1695	1300	㊳㊴
8V 502 C41	**390**	**523**	1800	A2A	2400	1770	1300	⑳㉓㉛*
8V 502 C51	**420**	**563**	1800	A2A	2700	1990	1300	⑳㉓㉛*
8V 502 C61	**450**	**603**	1800	A2A	2700	1990	1300	⑳㉓㉛*
8V 502 C71	**480**	**644**	1800	A2A	2800	2065	1300	⑳㉓㉛*
8V 502 C42	**375**	**503**	1800	A2A	2400	1770	1300	㉙㊳㊴
8V 502 C52	**405**	**543**	1800	A2A	2600	1915	1300	㉙㊳㊴
8V 502 C62	**440**	**590**	1800	A2A	2800	2065	1300	㉙㊳㊴
8V 502 C72	**480**	**644**	1800	A2A	3000	2210	1300	㉙㊳㊴

Optimization:
- ⑳ EPA Nonroad T3 Comp (40CFR89)
- ㉓ EU Nonroad St IIIA Comp (97/68/EC)
- ㉙ China Onroad Stage V (GB17691-2005)
- ㉛* China NRMM Stage III (GB20981-2014) upon request
- ㊳ EPA Nonroad T4i Comp (40CFR1039)
- ㊴ EU Nonroad St IIIB Comp (97/68/EC)

Cooling Variant:

A2A: Air-to-air charge air cooling (TD)

These engines are also available for vehicle main drive applications (MTU application group 5).

4B

Diesel engines for mechanical drive

354 kW - 410 kW (475 bhp - 550 bhp)

4B – Medium duty operation

Engine model	Reference no.	Rated power			Cooling Variant	Peak Torque			Optimization
		ICFN							
		kW	bhp	rpm	Nm	lb-ft	rpm		
S60 (12.7 l)	6063MK74	**373**	**500**	2100	A2A	2237	1650	1350	⑲
S60 (14.0 l)	6063HV39	**354**	**475**	2100	A2A	2102	1550	1350	⑳㉓㉛*
	6063HV39	**373**	**500**	2100	A2A	2102	1550	1350	⑳㉓㉛*
	6063HV39	**391**	**525**	2100	A2A	2373	1750	1350	⑳㉓㉛*
	6063HV39	**410**	**550**	2100	A2A	2373	1750	1350	⑳㉓㉛*
	6063HK73	**410**	**550**	2100	A2A	2373	1750	1350	⑲
	6063HK74	**410**	**550**	2100	A2A	2373	1750	1350	⑲

Optimization: ⑲ EPA Nonroad T2 Comp (40CFR89)
⑳ EPA Nonroad T3 Comp (40CFR89)
㉓ EU Nonroad St IIIA Comp (97/68/EC)
㉛* China NRMM Stage III (GB20981-2014) upon request

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

For additional power ratings please consult your MTU distributor/dealer.

6063HV39 with 391 kW/410 kW: Smoke optimized available upon request
6063MK74/6063HK74: Class 1, Div 2 and ATEX Zone 2 classifications available

These engines are also available for vehicle main drive applications (MTU application group 5).

Diesel engines for mechanical drive

150 kW - 736 kW (201 bhp - 987 bhp)

> Intake air temperature: 25°C

4B – Medium duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
4R 1000 C40	**150**	**201**	2200	A2A	800	590	1200-1600	㉑㉗
4R 1000 C50	**170**	**228**	2200	A2A	900	664	1200-1600	㉑㉗
6R 1000 C40	**230**	**308**	2200	A2A	1250	922	1200-1600	㉑㉗
6R 1000 C50	**260**	**349**	2200	A2A	1400	1033	1200-1600	㉑㉗
6R 1100 C40	**300**	**402**	1700	A2A	2000	1475	1300	㉑㉗
6R 1100 C50	**320**	**429**	1700	A2A	2100	1549	1300	㉑㉗
6R 1300 C40	**360**	**483**	1700	A2A	2300	1696	1300	㉑㉗
6R 1300 C50	**380**	**510**	1700	A2A	2380	1696	1300	㉑㉗
6R 1300 C60	**390**	**523**	1700	A2A	2460	1807	1300	㉑㉗
6R 1500 C50	**430**	**577**	1700	A2A	2750	2028	1300	㉑㉗
6R 1500 C60	**460**	**617**	1700	A2A	2900	2139	1300	㉑㉗
10V 1600 T60	**567**	**760**	2100	SCCC	3385	2497	1200	⑬㉑
10V 1600 T70	**613**	**822**	1900	SCCC	3517	2594	1300	⑬㉑
12V 1600 T50	**636**	**853**	1900	SCCC	4020	2965	1300	⑬㉑
12V 1600 T60	**680**	**912**	2100	SCCC	4100	3024	1300	⑬㉑
12V 1600 T70	**736**	**987**	1900	SCCC	4220	3113	1300	⑬㉑

Optimization: ⑬ EPA Nonroad T4 Comp (40CFR1039)
㉑ EPA Nonroad T4 (40CFR1039)
㉗ EU Nonroad St IV (97/68/EC)

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)
SCCC: Separate circuit charge air cooling

These engines are also available for vehicle main drive applications (MTU application group 5).

Diesel engines for mechanical drive

634 kW - 2023 kW (850 bhp - 2700 bhp)

> Charge-air coolant temperature: 47°C (16V 2000 S52)

4B – Medium duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 S52R	**634**	**850**	2100	SCCC	3681	2715	1350	⑲
12V 2000 S62	**675**	**905**	2100	SCCC	3918	2890	1350	⑲
12V 2000 S56	**783**	**1050**	1800/ 2100	SCCC	4640	3423	1100-1500	㊳
12V 2000 T57	**783**	**1050**	2100	SCCC	4636	on request	1100	㉑
16V 2000 S52	**899**	**1205**	1800	SCCC	5287	3900	1500	⑲
16V 2000 S52	**899**	**1205**	2100	SCCC	5287	3900	1500	⑲
16V 2000 S56	**970**	**1301**	2100	SCCC	5471	4035	1300	㊳
16V 2000 T57	**970**	**1301**	2100	SCCC	5226	on request	1100	㉑
12V 4000 S51R	**1398**	**1875**	1900	SCCC	7610	5613	1500	②
12V 4000 S51	**1510**	**2025**	1900	SCCC	8199	6047	1500	②
16V 4000 S51R	**1864**	**2500**	1900	SCCC	10147	7484	1500	☒
16V 4000 S51	**2023**	**2700**	1900	SCCC	10931	8062	1500	②

Optimization: ☒ Fuel consumption optimized
② EPA Nonroad T1 Comp (40CFR89)
⑲ EPA Nonroad T2 Comp (40CFR89)
㉑ EPA Nonroad T4 (40CFR1039)
㊳ EPA Nonroad T4i Comp (40CFR1039)

Cooling Variant:
SCCC: Separate circuit charge air cooling

Data for Tier 4 final engines are preliminary.

Diesel engines for mechanical drive

447 kW - 496 kW (600 bhp - 665 bhp)

> Intake air temperature: 25°C

4C – Short-time duty operation

Engine model	Reference no.	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
		kW	bhp	rpm		Nm	lb-ft	rpm	
S60 (14.0 l)	6063HK73	**447**	**600**	2100	A2A	2576	1900	1350	⑥⑲
	6063HK74	**447**	**600**	2100	A2A	2576	1900	1350	⑥⑲
	6063HV39	**447**	**600**	2100	A2A	2576	1900	1350	⑳㉓㉛*
	6063HV39	**470**	**630**	2100	A2A	2576	1900	1350	⑳㉓㉛*
	6063HV39	**496**	**665**	2300	A2A	2576	1900	1350	⑳㉓㉛*

Optimization: ⑥ IMO I
⑲ EPA Nonroad T2 Comp (40CFR89)
⑳ EPA Nonroad T3 Comp (40CFR89)
㉓ EU Nonroad St IIIA Comp (97/68/EC)
㉛* China NRMM Stage III (GB20981-2014) upon request

All 4A/4B-ratings can be used for 4C applications!

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

These engines are also available for vehicle main drive applications (MTU application group 5).

6063HV39: Smoke optimized available upon request
6063HK74: Class 1, Div 2 and ATEX Zone 2 classifications available

Diesel engines for mechanical drive

750 kW - 1120 kW (1005 bhp - 1500 bhp)

> Charge-air coolant temperature: 44°C (16V 2000 S92)
47°C (16V 2000 S92R)

4C – Short-time duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 S92R	**750**	**1005**	2100	SCCC	4204	3100	1350	⑲
16V 2000 S92R	**1000**	**1340**	2100	SCCC	5316	3921	1500	⑲
16V 2000 S92	**1120**	**1500**	2100	SCCC	5095	3757	1500	⑲

Optimization: ⑲ EPA Nonroad T2 Comp (40CFR89)

Cooling Variant:
SCCC: Separate circuit charge air cooling

Diesel engines for mechanical drive

675 kW - 2320 kW (905 bhp - 3110 bhp)

> Engines are designed with water cooled exhaust manifolds and turbochargers

4C – Short-time duty operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 P92R	**675**	**905**	1800	SCCC	4010	2960	1500	⑥⑱⑲
12V 2000 P92	**788**	**1055**	2100	SCCC	4010	2960	1500	⑥⑱⑲
16V 2000 P92R	**900**	**1205**	1800	SCCC	5348	3945	1500	⑥⑱⑲
16V 2000 P92	**1050**	**1408**	2100	SCCC	5348	3945	1500	⑥⑱⑲
12V 4000 P91 [1]	**1740**	**2330**	2000	SCCC	9232	6810	1800	②⑥
16V 4000 P91 [1]	**2320**	**3110**	2000	SCCC	12309	9075	1800	②⑥

Optimization: ② EPA Nonroad T1 Comp (40CFR89)
⑥ IMO I
⑱ IMO II
⑲ EPA Nonroad T2 Comp (40CFR89)

1) Third party Certifications available on request

Cooling Variant:
SCCC: Separate circuit charge air cooling

Diesel engines for mechanical drive

858 kW - 2461 kW (1150 bhp - 3300 bhp)

> Charge-air coolant temperature: 44°C (16V 2000 S82)
47°C (16V 2000 S96)
55°C (12V 4000 S83)

4D – Frac operation

Engine model	Rated power ICFN			Cooling Variant	Peak Torque			Optimization
	kW	bhp	rpm		Nm	lb-ft	rpm	
12V 2000 S96	**858**	**1150**	2100	SCCC	4911	3622	1300-1600	㊳
12V 2000 T97	**858**	**1151**	2100	SCCC	4910	on request	1200	㉑
16V 2000 S82	**1120**	**1500**	2100	SCCC	6005	4429	1500	⑲
16V 2000 S96	**1163**	**1560**	2100	SCCC	6582	4854	1300	㊳
16V 2000 T97	**1163**	**1560**	2100	SCCC	6398	on request	1300	㉑
12V 4000 S83	**1678**	**2250**	1900	SCCC	10000	7376	1540	⑲㉛*
12V 4000 T94	**1680**	**2253**	1900	SCCC	8750	6138	1400	㊳
12V 4000 T95R	**1680**	**2253**	1900	SCCC	9035	on request	1400	㉑
12V 4000 S81	**1678**	**2250**	1900	SCCC	9339	6888	1650	②
12V 4000 S83L	**1865**	**2500**	1900	SCCC	10460	7715	1560	⑲㉛*
12V 4000 T95	**1865**	**2501**	1900	SCCC	9654	on request	1400	㉑
12V 4000 T94L	**1865**	**2500**	1900	SCCC	9373	6812	1900	㊳
12V 4000 T95L	**1939**	**2600**	1900	SCCC	9145	on request	1900	㉑
16V 4000 S83	**2237**	**3000**	1900	SCCC	13333	9834	1540	⑲㉛*
16V 4000 T95	**2240**	**3004**	1900	SCCC	11664	on request	1400	㉑
16V 4000 S81	**2237**	**3000**	1900	SCCC	12452	9184	1650	②
16V 4000 S83L	**2461**	**3300**	1900	SCCC	Please consult your distributor.			☒㉛*

Optimization: ☒ Fuel consumption optimized
② EPA Nonroad T1 Comp (40CFR89)
⑲ EPA Nonroad T2 Comp (40CFR89)
㉑ EPA Nonroad T4 (40CFR1039)
㉛* China NRMM Stage III (GB20981-2014) upon request
㊳ EPA Nonroad T4i Comp (40CFR1039)

Cooling Variant:
SCCC: Separate circuit charge air cooling

Data for Tier 4 final engines are preliminary.

MTU Systems

Diesel engine gensets for electric drilling application

1105 kW - 1420 kW (1482 bhp - 1904 bhp)

Electric Drilling Package (EDP)

Engine model	Rated power ICXN		Cooling	Optimization
	60 Hz - 1200 rpm		Variant	
	kW	bhp		
12V 4000 G73	**1105**	**1482**	A2A	⑲
	50 Hz - 1500 rpm			
	kW	bhp		
12V 4000 G23	**1420**	**1904**	A2A	①☒

Optimization: ☒ Fuel consumption optimized
① Emission optimized (TA-Luft)
⑲ EPA Nonroad T2 Comp (40CFR89)

12V engine with starting system, fuel system, base frame and generator.

Cooling Variant:
A2A: Air-to-air charge air cooling (TD)

Diesel engine power module for frac application

1680 kW - 1939 kW (2250 bhp - 2600 bhp)

MTU FracPack

Package model	Engine type
TF12V4000C1	4000 T95R
TF12V4000C1	4000 T95
TF12V4000C1	4000 T95L
PPSVZ12V4000-1A0	4000 S83

Rated power			Optimization
kW	bhp	rpm	
1680	**2250**	1900	㉑
1865	**2500**	1900	㉑
1939	**2600**	1900	㉑
1865	**2500**	1900	⑲

Optimization: ⑲ EPA Nonroad T2 Comp (40CFR89)
㉑ EPA Nonroad T4 (40CFR1039)

12V engine with ZF 8 TX frac transmission, instrumentation, cradle and package shipping skid.

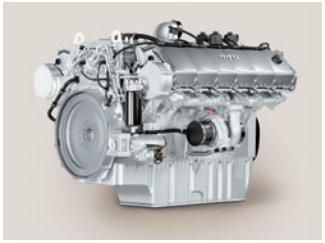
Optional equipment*: Pre-heating system, air compressor, emergency air shut-off flaps, fuel system, lifting device and back pack.

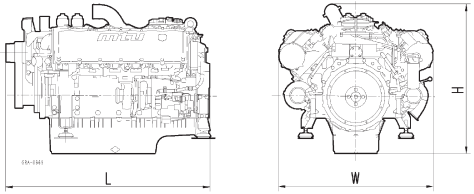
*available for MTU FracPack with 12V 4000 T95 only.

Engine Data

Diesel engines for generator drive

Series 1600





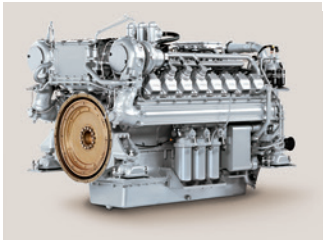
Diesel engines for generator drive

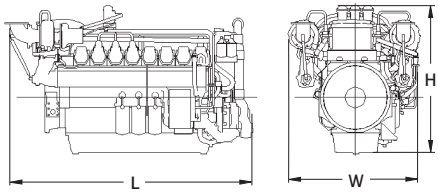
Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
6R 1600 Gx0 6 Cyl./In-line	122/150 (4.8/5.9)	1.75 (107)	10.5 (641)	1535 x 920 x 1185 (60.4 x 36.2 x 46.7)	1272 (2804)
8V 1600 Gx0 8 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	14.0 (854)	1375 x 1235 x 1225 (54.1 x 48.6 x 48.2)	1519 (3349)
10V 1600 Gx0 10 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	17.5 (1068)	1550 x 1258 x 1188 (61 x 50 x 47)	1827 (4028)
12V 1600 Gx0 12 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	21.0 (1282)	1715 x 1274 x 1188 (68 x 50 x 47)	2145 (4729)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for generator drive

Series 2000





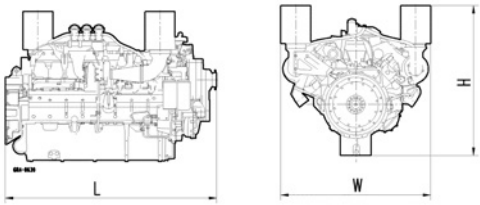
Diesel engines for generator drive

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 2000 Px2 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	1882 x 1580 x 1585 (74 x 62 x 62)	2650 (5842)
16V 2000 Px2 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1941)	2180 x 1580 x 1585 (86 x 62 x 62)	3060 (6746)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for generator drive

Series 2000



Diesel engines for generator drive

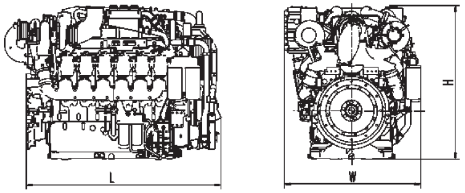
Engine	Cylinder data			Dimensions [1]	Mass [1]
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 2000 Gx5 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	1882 x 1580 x 1580 (74 x 62 x 62)	2490 (5490)
12V 2000 Gx5-TB 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	1835 x 1580 x 1580 (72 x 62 x 62)	2570 (5665)
16V 2000 Gx5 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1941)	2226 x 1580 x 2015 (88 x 62 x 79)	3150 (6835)
16V 2000 Gx5-TB 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1941)	2180 x 1580 x 1580 (86 x 62 x 62)	3180 (7010)
18V 2000 Gx5 18 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	35.8 (2185)	2400 x 1780 x 2015 (95 x 70 x 79)	3500 (7715)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

1) Series 2000: Dimensions and masses refer to engines with water-to-air charge air cooling; engines with air-to-air charge air-cooling and integrated 40°C - radiators and fan = Length + 650 mm (12/16V) +850mm (18V)

Diesel engines for generator drive

Series 2000



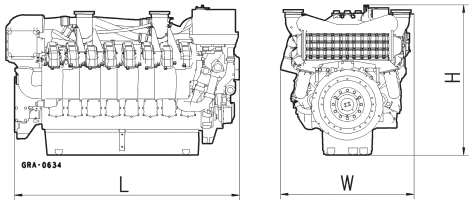
Diesel engines for generator drive

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
16V 2000 Gx6 16 Cyl./90°V	135/156 (5.3/6.15)	2.23 (136)	35.68 (2177)	2370 x 1280 x 1430 (93 x 50 x 56)	3350 (7386)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for generator drive

Series 4000

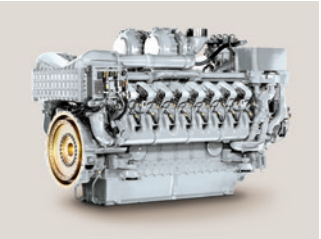


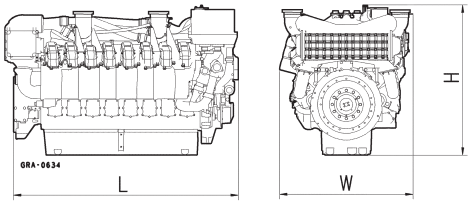
Diesel engines for generator drive

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 Px1 12 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	48.7 (2972)	2400 x 1510 x 1840 (95 x 59 x 72)	6550 (14440)
16V 4000 Px1 16 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	65.0 (3967)	3470 x 1520 x 1850 (112 x 60 x 76)	7085 (15620)
12V 4000 Gx3 12 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2490 x 1610 x 1870 (98 x 63 x 74)	6200 (13670)
16V 4000 Gx3 16 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)	2865 x 1660 x 1810 (113 x 65 x 71)	7700 (16975)
20V 4000 Gx3 20 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	95.4 (5822)	3410 x 1615 x 2050 (134 x 64 x 81)	9640 (21255)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for generator drive





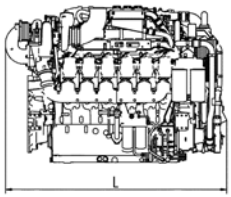
Diesel engines for generator drive

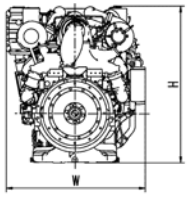
Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 Px3 12 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2530 x 1580 x 2065 (100 x 62 x 81)	7300 (16100)
16V 4000 Px3 16 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)	3000 x 1580 x 2065 (122 x 62 x 81)	8800 (19400)
20V 4000 Px3 20 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	95.4 (5822)	3470 x 1510 x 2050 (137 x 60 x 81)	10750 (23700)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 2000





Diesel engines for mechanical drive

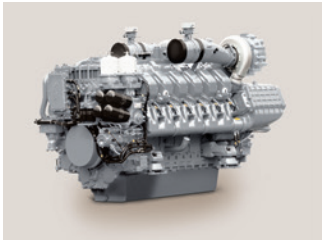
Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 2000 Px2 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	2165 x 1340 x 1490 (85 x 53 x 59)	2650 (5842)
16V 2000 Px2 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1947)	2502 x 1340 x 1495 (99 x 53 x 59)	3060 (6746)
12V 2000 Sx2 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	1864 x 1205 x 1287 (73 x 47 x 51)	2416 (5326)
16V 2000 Sx2 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1947)	2360 x 1248 x 1314 (93 x 49 x 52)	2904 (6402)
12V 2000 Sx6 12 Cyl./90°V	135/165 (5.3/6.2)	2.23 (136)	26.8 (1633)	2030x1280x1430 (80x50x56)	2950 (6503)
16V 2000 Sx6 16 Cyl./90°V	135/165 (5.3/6.2)	2.23 (136)	35.7 (2177)	2370x1280x1430 (94x50x57)	3350 (7385)
12V 2000 Tx7 12 Cyl./90°V	135/165 (5.3/6.2)	2.23 (136)	26.8 (1633)	2028x1280x1462 (80x50x58)	2950 (6504)
16V 2000 Tx7 16 Cyl./90°V	135/165 (5.3/6.2)	2.23 (136)	35.7 (2177)	2378x1288x1488 (94x51x59)	3340 (7363)

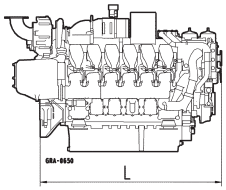
Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.

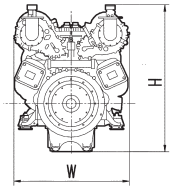
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 4000







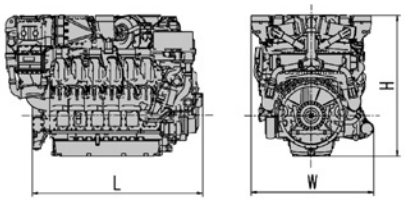
Diesel engines for mechanical drive

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 Px1 12 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	48.7 (2972)	2400 x 1520 x 1930 (95 x 60 x 76)	6045 (13325)
16V 4000 Px1 16 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	65.0 (3967)	2850 x 1520 x 1930 (112 x 60 x 76)	7085 (15620)
12V 4000 Sx1 12 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	48.7 (2972)	2409 x 1588 x 1736 (94.8 x 62.5 x 68.3)	6045 (13325)
16V 4000 Sx1 16 Cyl./90° V	165/190 (6.5/7.5)	4.06 (248)	65.0 (3967)	2879 x 1588 x 1736 (113.4 x 62.5 x 68.3)	7030 (15615)
12V 4000 Sx3 12 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2405 x 1585 x 1870 (95 x 62 x 74)	6045 (13325)
16V 4000 Sx3 16 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4656)	2975 x 1476 x 1867 (117 x 58 x 74)	7514 (16566)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 4000



Diesel engines for mechanical drive

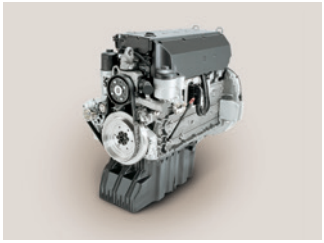
Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 Tx4 12 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2683 x 1663 x 1943 (105.1 x 65.5 x 75.6)	7685 (16535)
12V 4000 Tx5 12 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2638 x 1663 x 1943 (104 x 65 x 76)	7820 (17240)
16V 4000 Tx5 16 Cyl./90° V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4656)	3201 x 1663 x 1943 (126 x 65 x 76)	9350 (20613)

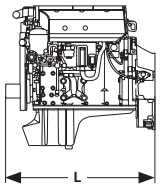
Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

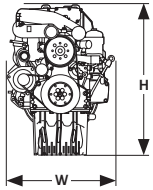
Diesel engines for mechanical drive

Mercedes-Benz Engineering Excellence

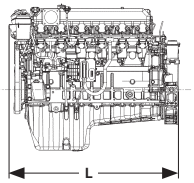
Series 900

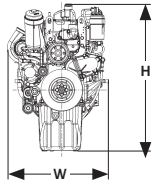






Series 460





Diesel engines for mechanical drive

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
4R 904 Cx1 4 Cyl./In-Line	102/130 (4.0/5.1)	1.06 (65)	4.2 (256)	830 x 672 x 945 (33 x 26 x 37)	395 (870)
4R 924 Cx1 4 Cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	4.8 (293)	830 x 645 x 925 (33 x 25 x 36)	405 (893)
4R 924 Cx2 4 Cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	4.8 (293)	830 x 645 x 925 (33 x 25 x 36)	415 (915)
6R 906 Cx1 6 Cyl./In-Line	102/130 (4.0/5.1)	1.06 (65)	6.4 (391)	1087 x 688 x 956 (43 x 27 x 38)	530 (1168)
6R 926 Cx1 6 Cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	7.2 (439)	1087 x 681 x 956 (43 x 27 x 38)	530 (1168)
6R 926 Cx2 6 Cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	7.2 (439)	1087 x 681 x 956 (43 x 27 x 38)	545 (1202)
6R 460 C11R-C21 6 Cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)	1315 x 785 x 1142 (52 x 31 x 45)	920 (2028)
6R 460 C31-C71 6 Cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)	1320 x 750 x 1115 (52 x 30 x 44)	920 (2028)
6R 460 Cx2 6 Cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)	1320 x 750 x 1115 (52 x 30 x 44)	930 (2072)

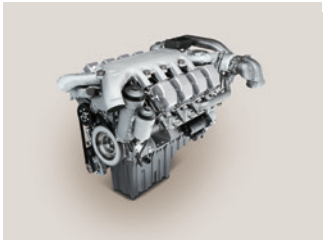
Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.

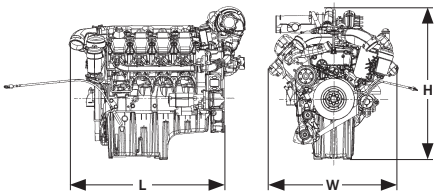
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Mercedes-Benz Engineering Excellence

Series 500





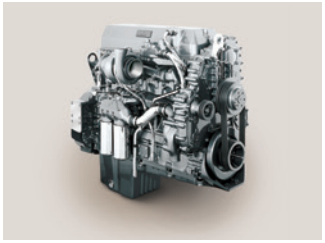
Diesel engines for mechanical drive

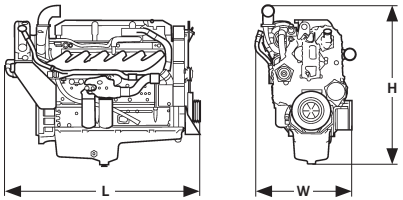
Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
6V 501 Cx1 6 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	12.0 (732)	1206 x 1020 x 1158 (47 x 40 x 46)	885 (1951)
6V 501 Cx2 6 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	12.0 (732)	1190 x 1020 x 1130 (47 x 40 x 44)	895 (1973)
8V 502 C21-C51 8 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	15.9 (970)	1515 x 1013 x 1053 (60 x 40 x 41)	1125 (2480)
8V 502 C61-C71 8 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	15.9 (970)	1385 x 1021 x 1198 (55 x 40 x 47)	1125 (2480)
8V 502 Cx2 8 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	15.9 (970)	1530 x 1195 x 1080 (60 x 47 x 43)	1135 (2502)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 60





Diesel engines for mechanical drive

Engine	Cylinder data			Dimensions	Mass	Weight/Power ratio
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)	kg/kW (lbs./bhp)
S60 6 Cyl./In-line	130/160 (5.1/6.3)	2.12 (129)	12.7 (775)	1455 x 925 x 1380 (57 x 36 x 54)	1290 (2844)	3.5 - 5.8 (5.7 - 9.5)
S60 6 Cyl./In-line	133/168 (5.2/6.6)	2.33 (142)	14.0 (854)	1455 x 925 x 1380 (57 x 36 x 54)	1215 (2680)	2.4 - 5.4 (4.0 - 8.9)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 1000

Series 1100

Series 1300

Series 1500

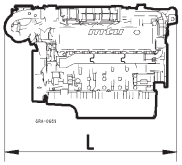
Diesel engines for mechanical drive

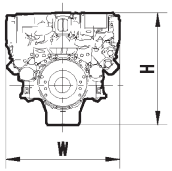
Engine	Cylinder data			Dimensions, max.	Mass, max.	Weight/Power ratio
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)	kg/kW (lbs./bhp)
4R 1000 Cx0 4 Cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	5.1 (311)	818 x 755 x 1033 (32.2 x 29.7 x 40.7)	540 (1190)	3.2 - 5.4 (5.2 - 8.9)
6R 1000 Cx0 6 Cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	7.7 (470)	1059 x 821 x 1033 (41.7 x 32.3 x 40.7)	705 (1555)	2.7 - 3.9 (4.5 - 6.5)
6R 1100 Cx0 6 Cyl./In-Line	125/145 (4.9/5.7)	1.77 (108)	10.7 (652)	1325 x 955 x 1230 (52.7 x 37.6 x 48.4)	990 (2183)	3.1 - 3.5 (5.1 - 5.8)
6R 1300 Cx0 6 Cyl./In-Line	132/156 (5.2/6.1)	2.13 (130)	12.8 (781)	1375 x 980 x 1260 (54.1 x 38.6 x 49.6)	1140 (2513)	2.9 - 3.4 (4.8 - 5.5)
6R 1500 Cx0 6 Cyl./In-Line	139/171 (5.5/6.7)	2.60 (159)	15.6 (952)	1425 x 1005 x 1290 (56.1 x 39.6 x 50.8)	1277 (2815)	2.7 - 3.2 (4.4 - 5.3)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engines for mechanical drive

Series 1600





Diesel engines for mechanical drive

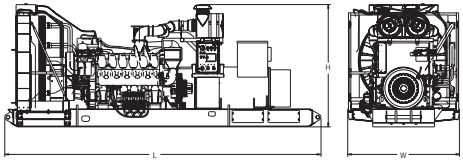
Engine	Cylinder data			Dimensions, max.	Mass, max.	Weight/Power ratio
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)	kg/kW (lbs./bhp)
10V 1600 Tx0 10 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	17.5 (1068)	1707 x 1258 x 1200 (67.2 x 49.5 x 47.2)	1940 (4277)	3.2 - 3.4 (5.3 - 5.6)
12V 1600 Tx0 12 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	21 (1282)	1873 x 1258 x 1200 (73.7 x 49.5 x 47.2)	2200 (4850)	3.0 - 3.5 (5.0 - 5.7)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel engine gensets for electric drilling application

Electric Drilling Package

EDP 50Hz with 12V 4000 G23



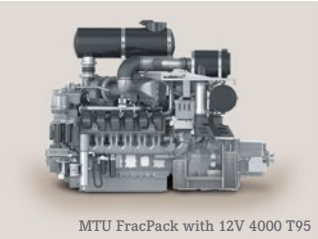
Electric Drilling Package

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 G73 12 Cyl./In-line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	7160 x 2521 x 2785 (282 x 100 x 110)	16556 (36500)
12V 4000 G23 12 Cyl./In-line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	6260 x 2374 x 2444 (247 x 94 x 96)	15060 (33200)

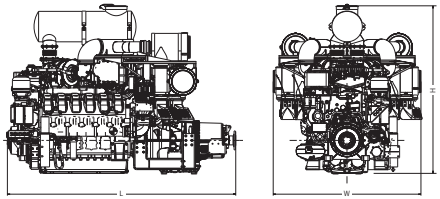
Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

Diesel Engine Power Modules for well servicing application

MTU FracPack



MTU FracPack with 12V 4000 T95



MTU FracPack

Engine	Cylinder data			Dimensions	Mass
	Bore/Stroke mm (in)	Cyl. displac l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
12V 4000 T95 12 Cyl./In-line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	3812 x 2465 x 2822 (150 x 97 x 111)	on request
12V 4000 S83 12 Cyl./In-line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	3849 x 1597 x 1867 (152 x 63 x 74)	7839 (17281)

Please note, specifications are subject to change without notice.
All dimensions are approximate. Details are subject to options selected.
Please contact your mtu distributor for current information and binding data.

MTU **Value**Care

Your partner in the field.
Drilling and well servicing contractors all over the world depend on MTU engines for powerful, reliable performance. That's because they're built to meet the unique demands of your business—the long, continuous operating cycles under high loads, extreme climates and challenging topography in some of the world's most remote locations. MTU **Value**Care products and services are designed with equal care to maximize your engine's performance, uptime and productivity.

MTU **Value**Care includes three product lines:
- **Value**Service:
  Extensive global service and support to help you get the most out of your equipment and protect your investment
- **Value**Spares:
  A full line of genuine replacement parts and top-quality consumables to keep your MTU engines and systems running optimally
- **Value**Exchange:
  A wide range of genuine remanufactured parts and engines delivering factory-new performance at value-conscious prices

MTU **Value**Care products and services are available worldwide through our extensive network of authorized distributors and service dealers. For more information, please contact your local MTU service center or visit www.mtu-online.com.

ValueService

Complete maintenance and support.
Every MTU engine and system is built to last, with MTU's legendary high engineering standards. But our commitment to quality and uptime doesn't stop there. To ensure a long and productive life for your MTU equipment, count on **Value**Service—our full line of maintenance and repair solutions to help you protect your investment and get the most out of your equipment. Whether it's routine maintenance and repair services from MTU-certified technicians or training and technical documentation, MTU provides everything you need—with world-class support customized to your specifications.

Products include:

- Maintenance, Repair and Overhaul:
  With a wide range of maintenance and repair options, MTU is your true lifecycle partner. Our staff of trained professionals is committed to providing whatever level of support you need throughout the life of your MTU equipment. MTU's expert technicians and factory-approved methods optimize availability and reduce lifecycle costs while helping to avoid unexpected problems. We also offer quick, efficient repair services to help you get back to work as quickly as possible if unexpected problems do occur.
- Annual Check:
  Optimize your engine's performance and avoid unexpected downtime with professional inspections and maintenance recommendations from MTU. The process includes visual engine inspection, test run and leak check, on-site engine oil and coolant analysis, diagnostic evaluation and reporting.
- Training:
  Our training programs are designed to make your service personnel proficient with MTU engines and systems. MTU training centers provide a hands-on learning experience with engines, sub-assemblies, electronics systems and passionate trainers with invaluable knowledge.
- Technical Documentation:
  Comprehensive technical documentation provides complete, clear information on the operation and maintenance of all our engines and systems, tailored to the unique and specific needs of each engine or system. Information includes safety requirements, correct fluids and lubricants, and recommended preventive maintenance schedules.
- Workshop and Test Bench Solutions:
  From start to finish, only MTU offers a full range of tools and expertise to help you get the most from your workshop and test stand projects. Our services range from consultation to the turnkey handover of operational facilities.
- Service Units:
  Integrating workshop, storage and office facilities, MTU Service Units are easily transported and can be set up individually or in combination in virtually any location to maximize service support on site. You get confidence and peace of mind for any project in one convenient package.

ValueSpares

Never compromise.
MTU engines are built with legendary high standards. When it's time for replacement parts and consumables, don't settle for anything less. Enhance the life of your engine with **Value**Spares– the only parts and consumables that live up to MTU standards for craftsmanship, quality and performance. **Value**Spares products are tested and approved specifically for MTU engines and systems. And for added peace of mind, they're backed with a full factory warranty. To get the most from your equipment, there are no shortcuts. For maximum reliability, performance and uptime, choose a name you can trust–**Value**Spares by MTU.

Products include:

- Parts:
  Optimize the performance and value of your equipment with genuine parts that are designed to work seamlessly with your equipment. Available for modern and classic MTU, Detroit Diesel and Mercedes off-highway engines, we offer everything you need for a turnkey installation. Our global logistics network ensures maximum availability and prompt delivery to even the most remote locations.
- Consumables:
  Maximize your engine's performance and longevity with the only filters, oils and coolants that are tested and approved specifically for use in your engine. Available from a single source, **Value**Spares consumables are an essential part of your preventive maintenance program.

ValueExchange

Genuine factory remanufactured products.
ValueExchange remanufactured MTU products deliver the same high standards of performance, service life and quality as new MTU products, along with identical warranty coverage—at a fraction of the cost. And with design and model-related updates made during the remanufacturing process, they also feature similar technological advancements.

Developed by R&D engineers, the **Value**Exchange remanufacturing process is designed to save you time and money, while benefiting the environment through the reuse of existing materials. All **Value**Exchange products are remanufactured by MTU-certified technicians at MTU Reman Centers, according to strict MTU standards. Only MTU can remanufacture MTU products to their original factory specifications.

To help you work more efficiently, a wide range of **Value**Exchange parts, engines and systems are available worldwide from our MTU service network. And for your convenience, swing programs with quick, fixed turnaround times are also available.

MTU Service Network

Local support. Worldwide.

Optimal engine performance and predictable costs, with individualized support from our global network of more than 1,200 service centers–anywhere, anytime. That's what you can expect from MTU ValueCare.

Find your authorized MTU distributor at www.mtu-online.com.

Customer Assistance Center

One call is all it takes.
Agents are available 24/7 for fast response to your inquiries and any service needs.

E-mail:
info@mtu-online.com

Europe, Middle East, Africa
+49 7541 90-77777

Asia/Pacific
+65 6860 9669

North and Latin America
+1 248 560 8888

Local support. Worldwide.
We ensure that you receive individualized support from our global network of more than 1,200 service centers – anywhere, anytime.

- Global headquarters
- Regional headquarters
- Sales and customer service center

Exhaust emissions
PowerGen applications

Many countries have implemented environmental legislation to protect people from consequences of polluted air. For this reason an increasing number of countries regulate emissions from specific mobile and stationary sources.

Emission standards may apply internationally, nationally and/or for specific areas. The enforcement of an emission legislation may depend for example on the area where the equipment is used and the way it is operated.

The emission legislations may be categorized by power range and/or cylinder capacity. Emission legislations generally require a certificate which states compliance. Stationary applications may require on-site approvals (on-site emission test) depending on the particular emission legislation.

Please find as follows examples of emission standards which apply to the PowerGen applications. For details please consult the applicable legislation and/or permitting authority.

PowerGen emission legislation may differentiate between stationary, mobile, constant and variable speed applications.

Mobile applications are often subject to nonroad mobile machinery emission limits.

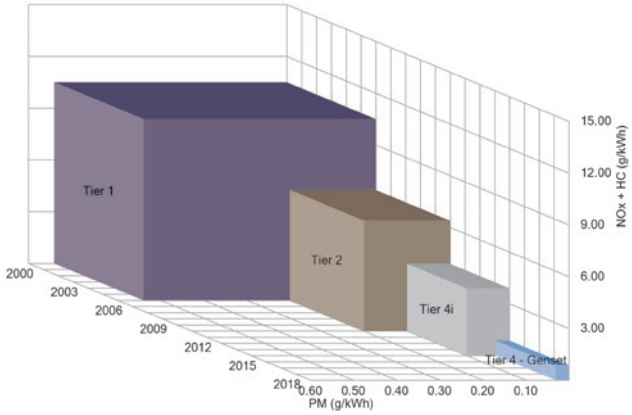
Stationary emission legislation differentiates between emergency standby and non-emergency applications. Usually non-emergency applications have more stringent emission limits. Engines for emergency standby applications are often limited by operating hours per year. The operating hour limitation may be defined differently from country to country.

Especially PowerGen applications may be subject to more stringent regional or municipal emission limits (e.g. Non-Attainment Areas).

Emission legislation for PowerGen applications is highly fragmented, e.g. US EPA, EU NRMM, TA-Luft, NEA Singapore, MoEF India/CPCB, China NRMM.

Sample for emission stages in PowerGen:
EPA

EPA NRMM > 560 kW - Genset



Exhaust emissions
Marine applications

Please find as follows examples of emission standards which apply to the Marine applications. For details please consult the applicable legislation and/or permitting authority.

IMO - International Maritime Organization
MARPOL Annex VI Regulation 13 (NOx) and NOx Technical Code 2008: Marine diesel engines > 130 kW for ships engaged on international voyages to which MARPOL Annex VI applies (= flying the flag of an signatory, or entering waters of the jurisdiction of an signatory to the Annex. Signatory overview see IMO webpage, "Status of Conventions").
Fixed & floating platforms, including drilling rigs and similar structures, are considered as ships. For those structures IMO regulations are in addition to any controls imposed by the government which has jurisdiction over the waters in which they operate.

Applicability of tiers:
For new ships date of construction of the ship, for engine replacement with non-identical engine or installation of additional engine date of installation. Exemption rules are in place.

Currently applicable emission stages:
- IMO Tier II outside of NOx Emissions Control Areas (NOx ECA)
- IMO Tier III is applicable in NOx Emissions Control Areas (NOx ECA) only

Emissions Control Area (ECA):
- An ECA may limit NOx, SOx and particulate matter (PM) emissions, or both. MARPOL Annex VI Regulation 14 (SOx and PM emission compliance) requires fuels with less than 1000 ppm (0.1 %) sulphur (since January 1st, 2015).
- The enforcement dates of an ECA will be specified for each ECA individually. For the North American & US Caribbean ECA this has been January 1st, 2016 with regard to NOx.
- Additionally to the North American & US Caribbean, the North Sea and the Baltic Sea are established as ECA for SOx and PM emissions.

US EPA - United States Environmental Protection Agency
40CFR1042: Marine diesel engines > 8 kW for vessels registered (flagged) in the United States.

Applicability of tiers:
Date of engine manufacture. Specific replacement engine rules are in place. Exemption rules are in place.

Currently applicable emission stages:
- < 600 kW EPA Tier 3
- < 1000 kW EPA Tier 3 - replaced by EPA Tier 4 latest by October 1st, 2017
- < 1400 kW EPA Tier 3 - replaced by EPA Tier 4 on January 1st, 2017
- > 1400 kW EPA Tier 4
- Recreational engines: EPA Tier 3

EU - European Union: Commercial Marine
EU Nonroad Directive 97/68/EC as amended by 2012/46/EC: Marine diesel propulsion engines ≥ 37 kW and auxiliary engines > 560 kW installed on vessels operating on inland waterways within EU territories (e.g. Rhine, Danube, Loire etc.).

Currently applicable emission stages:
- EU Stage IIIA
  Central Commission for Navigation on the Rhine (CCNR) rules are defined in the Rhine Vessel Inspection Regulation (RheinSchUO) valid for marine diesel engines ≥ 19 kW installed on vessels operating on the Rhine.

Currently applicable emission stages:
- CCNR Stage II
  Specific replacement engine rules are in place. Exemption rules are in place. Mutual recognition of CCNR and EU emission regulation is agreed.

Exhaust emissions
Marine applications

EU - European Union: Recreational Marine
EU Recreational Craft Directive (RCD) 94/25/EC as amended by 2003/44/EC and replaced by 2013/53/EU from January 18th, 2016: propulsion engines for recreational crafts from 2.5 to 24 m hull length operating within EU territories.

Applicability of stages:
Date of placing the vessel into the market. Exemption rules are in place.

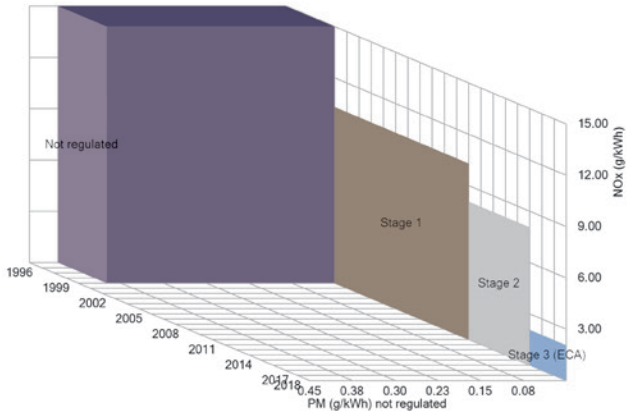
Currently applicable emission stages:
- RCD 1 valid until December 31st, 2016
- RCD 2 valid from January 18th, 2016
  In 2016 both standards RCD 1 and RCD 2 can be used.

Additional to afore mentioned emission regulations MTU is able to deliver many engines also for regional emission standards such as BSO (Lake Constance) or SAV (Switzerland) on request.

Besides current emission standards MTU is able to deliver also replacement engines with outdated emission standards. Replacement engine rules need to be observed.

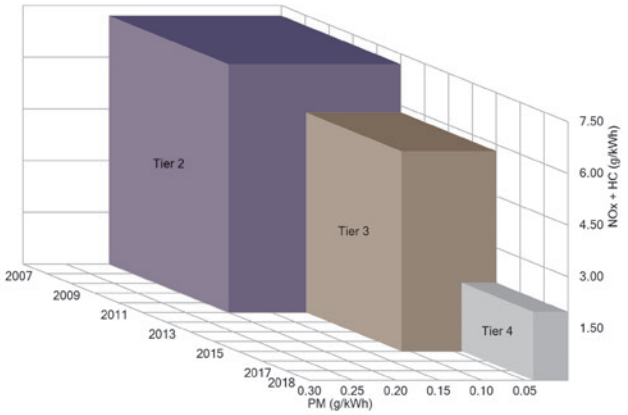
Samples for emission stages in Marine:
IMO

IMO Seagoing ships 1,600 rpm



EPA

EPA Marine C1 (< 35 kW/l) 1,400 - 2,000 kW/3.5 - 5.0 l



Exhaust emissions
Oil & Gas applications

Please find as follows examples of emission standards which apply to the Oil & Gas applications. For details please consult the applicable legislation and/or permitting authority.

Emission legislation for Oil & Gas applications may differentiate between mobile and stationary applications/machinery.

Mobile applications/machinery:
- Nonroad mobile machinery emission legislation may differentiate between constant and variable speed applications.
- Nonroad mobile machinery emission legislation may differentiate between ratings and cylinder volume.

Emission legislation for mobile applications are e.g. US EPA, EU NRMM, China NRMM, MoEF India/ CPCB

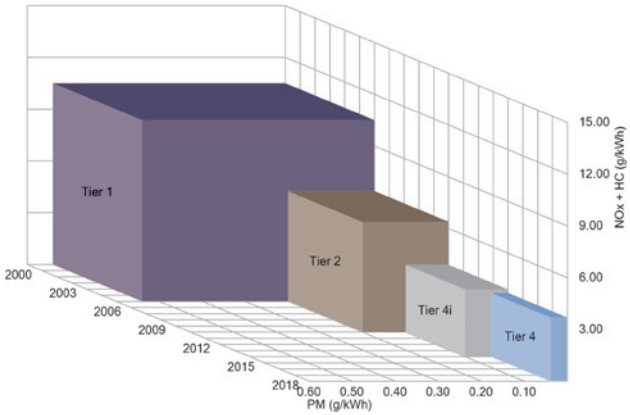
Stationary applications/machinery:
- Stationary emission legislation differentiates between emergency standby and non-emergency applications.
- Usually non-emergency applications have more stringent emission limits.
- Engines for emergency standby applications are often limited by operating hours per year. The operating hour limitation may be defined differently from country to country.

Especially stationary applications may be subject to more stringent regional or municipal emission limits (e.g. Non-Attainment Areas).

Emission legislation for stationary applications is highly fragmented, e.g. US EPA, EU NRMM, TA-Luft, NEA Singapore, MoEF India/ CPCB, China NRMM.

Samples for emission stages in Oil & Gas:
EPA

EPA NRMM > 560 kW



Examples for emission level description:
- US EPA Nonroad Tier 4 (40CFR1039)
  –> certified
- US EPA Nonroad Tier 2 Comp (40CFR89)
  –> compliant with emission legislation - not certified
- US EPA Nonroad Tier 2 Comp
  –> compliant and corresponding to emission limit values - not certified

Please note that the engines and systems (only) comply with the country or region specific emission requirements and have appropriate emission certification(s) which are explicitly stated in respective RRPS/MTU defined technical specifications. Any Export/Import/Operation of the engine in countries or regions with different applicable emission law requirements is at the customers responsibility.

Notes

Additional available sales programs:
– Marine
– Rail
– Gendrive
– C&I, Agricultural, Mining

Conversion Table

1 kW	= 1.360 PS	g	= 9.80665 m/s²
1 kW	= 1.341 bhp	π	= 3.14159
1 bhp	= 1.014 PS	e	= 2.71828
1 oz	= 28.35 g		
1 lb	= 453.59 g	1 lb	= 16 oz
1 short ton	= 907.18 kg	1 short ton	= 2000 lbs
1 lb/bhp	= 447.3 g/PSh	1 ft lb	= 1.356 Nm
1 lb/bhp	= 608.3 g/kWh	1 ft/min	= 0.00508 m/s
1 gal/bhp(US)	= 4264 g/kWh	pDiesel	= 0.85 kg/l
1 kWh	= 860 kcal	1 lb/sqin	= 0.069 bar (1 psi)
1 cal	= 4.187 J	1 mm Hg	= 1.333 mbar (133.3 Pa)
1 BTU	= 1.055 kJ	1 mm H_2O	= 0.0981 mbar (9.81 Pa)
1 inch	= 2.540 cm	T (K)	= t (°C) + 273.15
1 sq. inch	= 6.542 cm^2	t (°C)	= 5/9 x (t (°F) -32)
1 cu. inch	= 16.387 cm^3	t (°C)	= 5/4 x t (°R)
1 foot	= 3.048 dm	1 foot	= 12 inches
1 sq. foot	= 9.290 dm^2	1 yard	= 3 feet
1 mile	= 1.609 km	1 mile	= 5280 feet
1 naut. mile	= 1.853 km	1 naut. mile	= 6080 feet
1 UK Gallon	= 4.546 l		
1 US Gallon	= 3.785 l		
1 US Barrel	= 0.159 m^3		
	= 42 US Gallons		

Energy:	1 J = 1 Ws = 1 VAs = 1 Nm
Power:	1 W = 1 VA = 1 Nm/s
Force:	1 N = 1 kgm/s²
Pressure:	1 Pa = 1 N/m² (1 bar = 10^5 Pa)
MEP (bar)	$= \frac{P_{cyl}(kW) \times 1200}{n(1/min) \times V_{cyl}(l)}$
Torque (Nm)	$= \frac{P_{ges}(kW) \times 30000}{n(1/min) \times \pi}$

MTU Friedrichshafen GmbH
MTU Asia Pte Ltd
MTU America Inc.
Rolls-Royce Power Systems Companies
www.mtu-online.com

Subject to change. | 3190301 | Edition 01/16 | ENC 2016-03 CM | Printed in Germany on chlorine-free bleached paper.