Sales Program C&I, Agriculture, Mining

Edition 1/15
valid from 01/2015

Power. Passion. Partnership.

MTU: Power. Passion. Partnership.

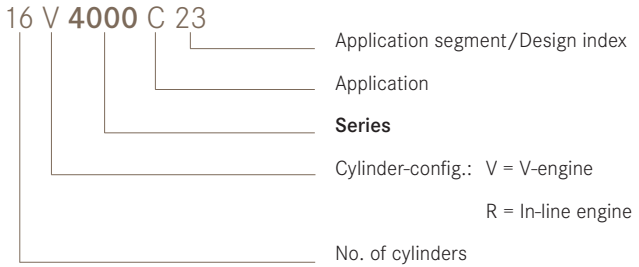
MTU is the core brand of Rolls-Royce Power Systems AG, which is a world-leading provider of high- and medium-speed diesel and gas engines, complete drive systems, distributed energy systems and fuel injection systems for the most demanding requirements.

The product range of MTU is one of the widest and most modern in the sector. We offer comprehensive, powerful and reliable engine solutions for yachts, commercial ships and naval vessels, construction and industrial vehicles, agricultural machinery, mining, rail and military vehicles as well as for the oil and gas industry. We also provide a full line of service products to help you maximize uptime and performance.

For over 100 years, MTU has been known for cutting-edge innovation and technological leadership. That same spirit of innovation inspires our sustainability efforts. Today and in the future, our focus is on developing and implementing system solutions to maximize efficiency and meet emissions standards.

Explanation of the engine designation

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



Cooling variants	
Separate circuit charge air cooling	1600/2000/4000
Air-to-air charge-air cooling	460/ 500/900/S60/ 1000/1100/1300/1500

General specifications

Diesel engine for mobile industrial, agricultural and mining applications

> Four-stroke, direct-injection
> Liquid-cooling and air-cooling
> 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
IFN = ISO standard fuel stop power
(ratings also apply to SAE J 1995 and J 1349 standard conditions)
Barometric pressure: 1000 mbar
Site altitude above sea level: 100 m

Please note, specifications are subject to change without further notice. All dimensions are approximate, more detailed information is included within installation drawings.

For further information on MTU C&I, Agriculture and Mining products please contact your MTU distributor or visit: **www.mtu-online.com**

Selection Guideline
Typical Applications

Diesel engines for industrial, agricultural and mining applications

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

> Intake air temperature: 25°C

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5A – Heavy duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling						
4R 904 C21	**75**	**101**	2200	400	295	1200-1600	⑦ ⑧ ㉚
4R 904 C31	**90**	**121**	2200	470	345	1200-1600	⑦ ⑧ ㉚
4R 924 C22	**95**	**127**	2200	500	370	1200-1600	⑯ ⑰
6R 906 C21	**130**	**174**	2200	675	500	1200-1600	⑦ ⑧ ㉚
6R 906 C31	**150**	**201**	2200	750	555	1200-1600	⑦ ⑧ ㉚
6R 926 C22	**175**	**234**	2200	850	625	1200-1600	⑯ ⑰ ㉚
6R 926 C32	**195**	**261**	2200	1020	750	1200-1600	⑯ ⑰ ㉚
6R 460 C11R	**220**	**295**	1800	1300	960	1300	⑦ ⑧ ㉚
6R 460 C11	**242**	**324**	1800	1600	1180	1300	⑦ ⑧ ㉚
6R 460 C21	**260**	**349**	1800	1750	1290	1300	⑦ ⑧ ㉚
6R 460 C31	**295**	**396**	1800	1900	1400	1300	⑦ ⑧ ㉚
6R 460 C22	**265**	**355**	1800	1750	1290	1300	⑯ ⑰ ㉙
6R 460 C32	**295**	**396**	1800	1900	1400	1300	⑯ ⑰ ㉙
6V 501 C31	**260**	**349**	1800	1730	1275	1300	⑦ ⑧ ㉚
6V 501 C32	**265**	**355**	1800	1850	1365	1300	⑯ ⑰
8V 502 C21	**330**	**442**	1800	2150	1585	1300	⑦ ⑧ ㉚
8V 502 C31	**350**	**469**	1800	2300	1695	1300	⑦ ⑧ ㉘ ㉚

Optimization:
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
⑯ Exhaust emission EPA 40 CFR 1039/Tier 4i
⑰ Exhaust emission EU 97/68 EC/Stage IIIB
㉘ China onroad certificate GB17691-2005/China III
㉙ China onroad certificate GB17691-2005/China V
㉚ China offroad certificate GB20891-2007/China Tier 2

All 5A-ratings can be used for 5B applications!

Diesel engines for industrial and mining applications

224 kW - 336 kW (300 bhp - 450 bhp)

> Intake air temperature: 25°C

5A – Heavy duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling							
S60 (12.7 l)	6063MK33	**224**	**300**	2100	1424	1050	1350	③ ⑤
	6063MK33	**242**	**325**	2100	1559	1150	1350	③ ⑤
	6063MK33	**261**	**350**	2100	1831	1350	1350	③ ⑤
	6063MK33	**280**	**375**	2100	1831	1350	1350	③ ⑤
	6063MK33	**298**	**400**	2100	1898	1400	1350	③ ⑤
	6063MK33	**298**	**400**	2200	1830	1350	1350	③ ⑤
S60 (14 l)	6063HK33	**336**	**450**	2100	2237	1650	1350	③ ⑤
S60 (14 l)	6063HV33	**242**	**325**	2100	1559	1150	1350	⑦ ⑧
	6063HV33	**280**	**375**	2100	1830	1350	1350	⑦ ⑧ ㉚
	6063HV33	**298**	**400**	2100	1898	1400	1350	⑦ ⑧
	6063HV33	**317**	**425**	2100	2000	1475	1350	⑦ ⑧
	6063HV33	**336**	**450**	2100	2102	1550	1350	⑦ ⑧ ㉚

Optimization:
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
㉚ China offroad certificate GB20891-2007/China Tier 2

All 5A-ratings can be used for 5B applications!

Diesel engines for industrial and mining applications

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

> Intake air temperature: 25°C

5A – Heavy duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air cooling						
4R 1000 C20	**100**	**134**	2200	600	443	1200-1500	㉑ ㉗
4R 1000 C30	**129**	**173**	2200	750	553	1200-1600	㉑ ㉗
6R 1000 C20	**180**	**241**	2200	1000	738	1200-1600	㉑ ㉗
6R 1000 C30	**210**	**282**	2200	1150	848	1200-1600	㉑ ㉗
6R 1100 C30	**280**	**375**	1700	1900	1401	1300	㉑ ㉗
6R 1300 C20	**320**	**429**	1700	2100	1549	1300	㉑ ㉗
6R 1300 C30	**340**	**456**	1700	2200	1623	1300	㉑ ㉗
6R 1500 C30	**400**	**536**	1700	2600	1918	1300	㉑ ㉗

Optimization: ㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final
㉗ Exhaust emission EU 97/68 EC/Stage IV

All 5A-ratings can be used for 5B applications!

Data for Tier 4 final engines are preliminary.

Diesel engines for agricultural applications

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

> Intake air temperature: 25°C

5A – Heavy duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air cooling						
4R 1000 A20	**100**	**134**	2200	600	443	1200-1500	㉑ ㉗
4R 1000 A30	**129**	**173**	2200	750	553	1200-1600	㉑ ㉗
6R 1000 A20	**180**	**241**	2200	1000	738	1200-1600	㉑ ㉗
6R 1000 A30	**210**	**282**	2200	1150	848	1200-1600	㉑ ㉗
6R 1100 A30	**280**	**375**	1700	1900	1401	1300	㉑ ㉗
6R 1300 A20	**320**	**429**	1700	2100	1549	1300	㉑ ㉗
6R 1300 A30	**340**	**456**	1700	2200	1623	1300	㉑ ㉗
6R 1500 A30	**400**	**536**	1700	2600	1918	1300	㉑ ㉗

Optimization: ㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final
㉗ Exhaust emission EU 97/68 EC/Stage IV

All 5A-ratings can be used for 5B applications!

Data for Tier 4 final engines are preliminary.

Diesel engines for industrial and mining applications

561 kW - 2375 kW (752 bhp - 3185 bhp)

> Intake air temperature: 25°C
> Charge-air coolant temperature: 45°C (12V2000C12/S4000)
48°C (16V2000C12R)
50°C (16V2000C12)

5A – Heavy duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Separate circuit charge-air cooling (SCCC)						
12V 2000 C27	**561**	**752**	1800	on request	on request	on request	㉑
12V 2000 C12	**567**	**760**	2100	3300	2441	1350	③
16V 2000 C12	**783**	**1050**	1800/2100	4450	3288	1350	③
12V 4000 C11R	**1193**	**1600**	1900	7612	5615	1500	☒ ②
12V 4000 C15	**1150**	**1542**	1800	7351	5422	1494	㉑
12V 4000 C11	**1286**	**1725**	1900	6985	5151	1500	☒ ②
12V 4000 C13R	**1193**	**1600**	1800	7595	5600	1500	☒ ③
12V 4000 C25	**1250**	**1676**	1800	7990	5893	1494	㉑
12V 4000 C13	**1343**	**1800**	1800	8550	6306	1500	☒ ③
12V 4000 C13L	**1425**	**1910**	1800	9070	6690	1500	☒ ③
12V 4000 C35	**1500**	**2012**	1800	9588	7072	1494	㉑
16V 4000 C11R	**1600**	**2146**	1800	10188	7515	1500	☒ ②
16V 4000 C11	**1715**	**2300**	1900	9313	6870	1500	☒ ②
16V 4000 C13R	**1492**	**2000**	1800	9520	7022	1350	☒ ③
16V 4000 C13	**1750**	**2345**	1800	11141	8216	1500	☒ ③
16V 4000 C13	**1750**	**2345**	1900	11141	8216	1500	☒
16V 4000 C13L	**1865**	**2500**	1800/1900	11870	8754	1500	☒ ③
20V 4000 C13L	**2375**	**3185**	1800	15120	11152	1500	☒ ③

Optimization: ☒ Fuel consumption
② Exhaust emission EPA 40 CFR 89/Tier 1 compliant
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final

All 5A-ratings can be used for 5B applications!

Data for Tier 4 final engines are preliminary.

Diesel engines for industrial, agricultural and mining applications

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

> Intake air temperature: 25°C

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5B

5B – Medium duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling						
4R 904 C61	110	147	2200	580	430	1200-1600	⑦ ⑧ ㉚
4R 904 C71	129	173	2200	675	500	1200-1600	⑦ ⑧ ㉚
4R 924 C71	145	194	2200	750	555	1200-1600	⑦ ⑧
4R 924 C52	115	154	2200	610	450	1200-1600	⑯ ⑰
4R 924 C62	129	173	2200	675	500	1200-1600	⑯ ⑰
4R 924 C72	150	201	2200	800	590	1200-1600	⑯ ⑰
6R 906 C51	170	228	2200	810	595	1200-1600	⑦ ⑧ ㉚
6R 906 C61	190	255	2200	1000	735	1200-1600	⑦ ⑧ ㉚
6R 906 C71	205	275	2200	1100	810	1200-1600	⑦ ⑧ ㉚
6R 926 C61	220	295	2200	1200	885	1200-1600	⑦ ⑧ ㉚
6R 926 C71	240	322	2200	1300	960	1200-1600	⑦ ⑧
6R 926 C52	210	281	2200	1120	825	1200-1600	⑯ ⑰ ㉚
6R 926 C62	225	302	2200	1200	885	1200-1600	⑯ ⑰ ㉚
6R 926 C72	240	322	2200	1300	960	1200-1600	⑯ ⑰ ㉚
6R 460 C41	315	422	1800	2000	1475	1300	⑦ ⑧ ㉚
6R 460 C51	335	449	1800	2000	1475	1300	⑦ ⑧ ㉘ ㉚
6R 460 C61	360	483	1800	2200	1620	1300	⑦ ⑧ ㉘ ㉚
6R 460 C71	375	503	1800	2200	1620	1300	⑦ ⑧
6R 460 C42	315	422	1800	2000	1475	1300	⑯ ⑰ ㉙
6R 460 C52	335	449	1800	2000	1475	1300	⑯ ⑰ ㉙
6R 460 C62	360	483	1800	2200	1620	1300	⑯ ⑰ ㉙
6R 460 C72	375	503	1800	2200	1620	1300	⑯ ⑰

Optimization:
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
⑯ Exhaust emission EPA 40 CFR 1039/Tier 4i
⑰ Exhaust emission EU 97/68 EC/Stage IIIB
㉘ China onroad certificate GB17691-2005/China III
㉙ China onroad certificate GB17691-2005/China V
㉚ China offroad certificate GB20891-2007/China Tier 2

Diesel engines for industrial, agricultural and mining applications

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

> Intake air temperature: 25°C

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5B

5B – Medium duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling						
6V 501 C51	**290**	**389**	1800	1850	1365	1300	⑦ ⑧ ㉚
6V 501 C61	**315**	**422**	1800	2000	1475	1300	⑦ ⑧ ㉘ ㉚
6V 501 C52	**300**	**402**	1800	2000	1475	1300	⑯ ⑰
6V 501 C62	**320**	**429**	1800	2100	1550	1300	⑯ ⑰
6V 501 C72	**350**	**469**	1800	2300	1695	1300	⑯ ⑰
8V 502 C41	**390**	**523**	1800	2400	1770	1300	⑦ ⑧ ㉘ ㉚
8V 502 C51	**420**	**563**	1800	2700	1990	1300	⑦ ⑧ ㉘ ㉚
8V 502 C61	**450**	**603**	1800	2700	1990	1300	⑦ ⑧ ㉘ ㉚
8V 502 C71	**480**	**644**	1800	2800	2065	1300	⑦ ⑧ ㉘ ㉚
8V 502 C42	**375**	**503**	1800	2400	1770	1300	⑯ ⑰ ㉙
8V 502 C52	**405**	**543**	1800	2600	1915	1300	⑯ ⑰ ㉙
8V 502 C62	**440**	**590**	1800	2800	2065	1300	⑯ ⑰ ㉙
8V 502 C72	**480**	**644**	1800	3000	2210	1300	⑯ ⑰ ㉙

Optimization:
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
⑯ Exhaust emission EPA 40 CFR 1039/Tier 4i
⑰ Exhaust emission EU 97/68 EC/Stage IIIB
㉘ China onroad certificate GB17691-2005/China III
㉙ China onroad certificate GB17691-2005/China V
㉚ China offroad certificate GB20891-2007/China Tier 2

Diesel engines for industrial and mining applications

317 kW - 429 kW (425 bhp - 575 bhp)

> Intake air temperature: 25°C

5B – Medium duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling							
S60 (12.7 l)	6063MK33	**317**	**425**	2100	2000	1475	1350	③ ⑤
	6063MK33	**332**	**445**	2200	2000	1475	1350	③ ⑤
	6063MK33	**336**	**450**	2100	2102	1550	1350	③ ⑤
	6063MK33	**354**	**475**	2100	2102	1550	1350	③ ⑤
S60 (14.0 l)	6063HV33	**354**	**475**	2100	2102	1550	1350	⑦ ⑧ ㉚
	6063HV33	**373**	**500**	2100	2102	1550	1350	⑦ ⑧ ㉚
	6063HV33	**391**	**525**	2100	2373	1750	1350	⑦ ⑧ ㉚
	6063HV33	**397**	**533**	2000	2373	1750	1350	⑦ ⑧
	6063HV33	**410**	**550**	2100	2373	1750	1350	⑦ ⑧ ㉚
	6063HK33	**391**	**525**	2100	2373	1750	1350	③ ⑤
	6063HK33	**397**	**533**	2000	2373	1750	1350	③ ⑤
	6063HK33	**410**	**550**	2100	2373	1750	1350	③ ⑤
	6063HK33	**410**	**550**	2300	2373	1750	1350	③ ⑤
	6063HK33	**429**	**575**	2100	2373	1750	1350	③ ⑤

Optimization:
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
㉚ China offroad certificate GB20891-2007/China Tier 2

Diesel engines for industrial and mining applications

150 kW - 730 kW (201 bhp - 979 bhp)

> Intake air temperature: 25°C

5B – Medium duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air cooling						
4R 1000 C40	**150**	**201**	2200	800	590	1200-1600	㉑ ㉗
4R 1000 C50	**170**	**228**	2200	900	664	1200-1600	㉑ ㉗
6R 1000 C40	**230**	**308**	2200	1250	922	1200-1600	㉑ ㉗
6R 1000 C50	**260**	**349**	2200	1400	1033	1200-1600	㉑ ㉗
6R 1100 C40	**300**	**402**	1700	2000	1475	1300	㉑ ㉗
6R 1100 C50	**320**	**429**	1700	2100	1549	1300	㉑ ㉗
6R 1300 C40	**360**	**483**	1700	2300	1696	1300	㉑ ㉗
6R 1300 C50	**380**	**510**	1700	2380	1755	1300	㉑ ㉗
6R 1300 C60	**390**	**523**	1700	2450	1807	1300	㉑ ㉗
6R 1500 C50	**430**	**577**	1700	2750	2028	1300	㉑ ㉗
6R 1500 C60	**460**	**617**	1700	2900	2139	1300	㉑ ㉗
	Separate circuit charge-air cooling (SCCC)						
10V 1600 C60	**567**	**760**	2100	3385	2497	1200	㉑ ㉖
10V 1600 C50	**610**	**818**	1900	3517	2594	1300	㉑ ㉖
12V 1600 C50	**630**	**845**	1900	4020	2965	1300	㉑ ㉖
12V 1600 C60	**680**	**912**	2100	4100	3024	1300	㉑ ㉖
12V 1600 C70	**730**	**979**	1900	4220	3113	1300	㉑ ㉖

Optimization: ㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final
㉖ Emission optimized without certificate
㉗ Exhaust emission EU 97/68 EC/Stage IV

Data for Tier 4 final engines are preliminary.

Diesel engines for agricultural applications

150 kW - 730 kW (201 bhp - 979 bhp)

> Intake air temperature: 25°C

5B – Medium duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air cooling						
4R 1000 A40	**150**	**201**	2200	800	590	1200-1600	㉑ ㉗
4R 1000 A50	**170**	**228**	2200	900	664	1200-1600	㉑ ㉗
6R 1000 A40	**230**	**308**	2200	1250	922	1200-1600	㉑ ㉗
6R 1000 A50	**260**	**349**	2200	1400	1033	1200-1600	㉑ ㉗
6R 1100 A40	**300**	**402**	1700	2000	1475	1300	㉑ ㉗
6R 1100 A50	**320**	**429**	1700	2100	1549	1300	㉑ ㉗
6R 1300 A40	**360**	**483**	1700	2300	1696	1300	㉑ ㉗
6R 1300 A50	**380**	**510**	1700	2380	1755	1300	㉑ ㉗
6R 1300 A60	**390**	**523**	1700	2450	1807	1300	㉑ ㉗
6R 1500 A50	**430**	**577**	1700	2750	2028	1300	㉑ ㉗
6R 1500 A60	**460**	**617**	1700	2900	2139	1300	㉑ ㉗
	Separate circuit charge-air cooling (SCCC)						
10V 1600 A60	**567**	**760**	2100	3385	2497	1200	㉑ ㉖
10V 1600 A50	**610**	**818**	1900	3517	2594	1300	㉑ ㉖
12V 1600 A50	**630**	**845**	1900	4020	2965	1300	㉑ ㉖
12V 1600 A60	**680**	**912**	2100	4100	3024	1300	㉑ ㉖
12V 1600 A70	**730**	**979**	1900	4220	3113	1300	㉑ ㉖

Optimization: ㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final
㉖ Emission optimized without certificate
㉗ Exhaust emission EU 97/68 EC/Stage IV

Data for Tier 4 final engines are preliminary.

Diesel engines for industrial and mining applications

634 kW - 2013 kW (850 bhp - 2699 bhp)

> Intake air temperature: 25°C
> Charge-air coolant temperature: 45°C (12V 2000/16V 2000 C66/S4000)
47°C (16V 2000 C22)

5B – Medium duty operation

Engine model	Rated power ICFN			Peak Torque			Optimization
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Separate circuit charge-air cooling (SCCC)						
12V 2000 C22R	**634**	**850**	2100	3750	2766	1500	③
12V 2000 C22	**675**	**905**	2100	4000	2950	1500	③
12V 2000 C57	**749**	**1004**	1800/2100	4636	3419	1100	㉑
12V 2000 C66R*	**783**	**1050**	1800	4636	3419	1100	⑯㉖
12V 2000 C66	**783**	**1050**	2100	4636	3419	1100	⑯㉖
12V 2000 C67	**783**	**1050**	2100	4636	3419	1100	㉑
16V 2000 C22	**899**	**1205**	1800/2100	5250	3872	1500	③
16V 2000 C66	**970**	**1301**	2100	5286	3899	1400	⑯㉖
16V 2000 C67	**970**	**1301**	2100	5286	3899	1400	㉑
12V 4000 C21R	**1398**	**1875**	1900	7612	5615	1500	☒ ②
16V 4000 C21R	**1492**	**2000**	1900	9494	7003	1500	②
12V 4000 C21	**1510**	**2025**	1900	8199	6047	1500	☒ ②
12V 4000 C23R	**1510**	**2025**	1800/1900	8482	6255	1700	☒ ③
12V 4000 C23	**1680**	**2253**	1800/1900	9435	6959	1700	☒ ③
12V 4000 C55	**1750**	**2347**	1900	9258	6828	1805	㉑
12V 4000 C65	**1864**	**2500**	1800	10409	7677	1710	㉑
12V 4000 C65	**1864**	**2500**	1900	9861	7273	1805	㉑
16V 4000 C20R	**1864**	**2500**	1900	10150	7485	1500	☒
16V 4000 C21	**1864**	**2500**	1900	10146	7483	1500	☒ ②
12V 4000 C64	**1865**	**2500**	1900	9373	6913	1900	⑯
16V 4000 C45	**2000**	**2682**	1900	10581	7804	1805	㉑
16V 4000 C45	**2000**	**2682**	1800	11169	8238	1710	㉑
16V 4000 C21L	**2013**	**2699**	1900	10933	8064	1500	☒ ②

Optimization: ☒ Fuel consumption
② Exhaust emission EPA 40 CFR 89/Tier 1 compliant
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑯ Exhaust emission EPA 40 CFR 1039/Tier 4i
㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final
㉖ Emission optimized without certificate
* also available for 2A application

Data for Tier 4 final engines are preliminary.

Diesel engines for industrial and mining applications

2013 kW - 3000 kW (2699 bhp - 4023 bhp)

> Intake air temperature: 25°C
> Charge-air coolant temperature: 45°C (12V 2000/16V 2000 C66/ S4000)
47°C (16V 2000 C22)

5B – Medium duty operation

Engine model	Rated power			Peak Torque			Optimization
	ICFN						
	kW	bhp	rpm	Nm	lb-ft	rpm	
	Separate circuit charge-air cooling (SCCC)						
16V 4000 C23R	**2013**	**2699**	1800/1900	11310	8342	1700	☒ ③
16V 4000 C31	**2125**	**2850**	1900	11142	8228	1800	☒
16V 4000 C23	**2240**	**3000**	1800	12566	9268	1700	☒ ③
16V 4000 C55	**2240**	**3004**	1900	11851	8741	1805	㉑
16V 4000 C55	**2240**	**3004**	1800	12509	9226	1710	㉑
16V 4000 C65	**2400**	**3218**	1800	13403	9886	1710	㉑
20V 4000 C22	**2720**	**3650**	1800	15159	11181	1500	②
20V 4000 C55	**2800**	**3755**	1800	15363	11331	1710	㉑
20V 4000 C23	**2800**	**3755**	1700	15728	11600	1700	☒ ③
20V 4000 C23L	**3000**	**4023**	1800	16852	12429	1700	☒ ③
20V 4000 C65	**3000**	**4023**	1800	16753	12356	1710	㉑

Optimization: ☒ Fuel consumption
② Exhaust emission EPA 40 CFR 89/Tier 1 compliant
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
㉑ Exhaust emission EPA 40 CFR 1039/Tier 4 final

Data for Tier 4 final engines are preliminary.

Diesel engines for industrial and mining applications

373 kW - 1000 kW (500 bhp - 1341 bhp)

> Intake air temperature: 25°C
> Charge-air coolant temperature: 45°C (S2000)

5C – Short-time duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling							
S60 (12.7 l)	6063MK33	**373**	**500**	2100	2102	1550	1350	③ ⑤
	6063MK33	**373**	**500**	2300	2237	1650	1350	③ ⑤
S60 (14.0 l)	6063HV33	**447**	**600**	2100	2576	1900	1350	⑦ ⑧ ㉚
	6063HV45	**447**	**600**	2300	2576	1900	1350	⑦ ⑧
	6063HV33	**470**	**630**	2100	2576	1900	1350	⑦ ⑧ ㉚
	6063HV33	**496**	**665**	2300	2576	1900	1350	⑦ ⑧ ㉚
	6063HV45	**496**	**665**	2300	2576	1900	1350	⑦ ⑧
	6063HK45	**447**	**600**	2300	2576	1900	1350	③ ⑤
	6063HK33	**447**	**600**	2100	2576	1900	1350	③ ⑤
	6063HK33	**470**	**630**	2100	2576	1900	1350	③ ⑤
	6063HK33	**496**	**665**	2300	2576	1900	1350	③ ⑤
	6063HK45	**496**	**665**	2300	2576	1900	1350	③ ⑤
	Separate circuit charge-air cooling (SCCC)							
12V2000 C92R	-	**750**	**1005**	2100	4100	3024	1500	③
16V2000 C92R	-	**1000**	**1341**	2100	5250	3872	1500	③

Optimization:
③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant
㉚ China offroad certificate GB20891-2007/China Tier 2

All 5A/5B-ratings can be used for 5C applications!

Diesel engines for underground mining applications

75 kW - 429 kW (101 bhp - 575 bhp)

> Intake air temperature: 25°C

Underground Mining

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
	Air-to-air charge-air cooling							
4R 904 C	4R 904 C21	**75**	**101**	2200	400	295	1400	MSHA
	4R 904 C31	**90**	**121**	2200	470	345	1400	MSHA
	4R 904 C	**100**	**134**	2200	520	385	1400	MSHA
	4R 904 C61	**110**	**147**	2200	580	430	1400	MSHA
	4R 904 C71	**130**	**174**	2200	675	500	1400	MSHA
6R 906 C	6R 906 C31	**150**	**201**	2200	750	555	1400	MSHA
	6R 906 C51	**170**	**228**	2200	810	595	1400	MSHA
	6R 906 C	**180**	**241**	2200	900	665	1400	MSHA
	6R 906 C61	**190**	**255**	2200	1000	735	1400	MSHA
	6R 906 C71	**205**	**275**	2200	1100	810	1400	MSHA
S60 (12.7 l)	6063MK32	**224**	**300**	2100	1424	1050	1350	MSHA
	6063MK32	**242**	**325**	2100	1600	1150	1350	MSHA
	6063MK32	**261**	**350**	2100	1830	1350	1350	MSHA
	6063MK32	**280**	**375**	2100	1830	1350	1350	MSHA
	6063MK32	**298**	**400**	2100	1830	1350	1350	MSHA
	6063MK32	**317**	**425**	2100	2000	1475	1350	MSHA
	6063MK32	**336**	**450**	2100	2102	1550	1350	MSHA
	6063MK32	**354**	**475**	2100	2102	1550	1350	MSHA
S60 (14.0 l)	6063HK32	**392**	**525**	2100	2373	1750	1350	MSHA
	6063HK32	**410**	**550**	2100	2373	1750	1350	MSHA
	6063HK32	**429**	**575**	2100	2373	1750	1350	MSHA

Optimization: MSHA (US regulation 30 CFR part 7)

Power*Drive*Unit based on the Series 60, 900, 460, 500 for industrial and mining applications

180 kW - 350 kW (240 bhp - 470 bhp)

> Intake air temperature: 25°C

5A – Heavy duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
Application (5A)	Heavy duty operation (Load factor > 60%)							
	Air-to-air charge-air cooling							
PDU240C	906	**180**	**240**	2200	900	665	1200-1600	⑦ ⑧
PDU295C	926	**220**	**295**	2200	1200	885	1200-1600	⑦ ⑧
PDU350C	460	**260**	**350**	1800	1750	1290	1200	⑦ ⑧
PDU470C	502	**350**	**470**	1800	2300	1695	1200	⑦ ⑧
PDU300C	6064MK33	**224**	**300**	2100	1425	1050	1350	③ ⑤
PDU325C	6064MK33	**242**	**325**	2100	1559	1150	1350	③ ⑤
PDU350C	6064MK33	**261**	**350**	2100	1830	1350	1350	③ ⑤
PDU375C	6064MK33	**280**	**375**	2100	1830	1350	1350	③ ⑤
PDU400C	6064MK33	**298**	**400**	2100	1900	1400	1350	③ ⑤
PDU450C	6064HK33	**336**	**450**	2100	2235	1650	1350	③ ⑤
PDU325C	6064HV33	**242**	**325**	2100	1559	1150	1350	⑦ ⑧
PDU375C	6064HV33	**280**	**375**	2100	1830	1350	1350	⑦ ⑧
PDU400C	6064HV33	**298**	**400**	2100	1898	1400	1350	⑦ ⑧
PDU425C	6064HV33	**317**	**425**	2100	2000	1475	1350	⑦ ⑧
PDU450C	6064HV33	**336**	**450**	2100	2102	1550	1350	⑦ ⑧

Optimization: ③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant

PDU includes: Cooling, air intake and exhaust system and mounting base.

All 5A-ratings can be used for 5B/5C applications!

Power*Drive*Unit based on the Series 60, 900, 460, 500 for industrial and mining applications

205 kW - 429 kW (275 bhp - 575 bhp)

> Intake air temperature: 25°C

5B – Medium duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
Application (5B)	Medium duty operation (Load factor < 60%)							
	Air-to-air charge-air cooling							
PDU275C	906	**205**	**275**	2200	1100	810	1200-1600	⑦ ⑧
PDU320C	926	**240**	**320**	2200	1200	885	1200-1600	⑦ ⑧
PDU420C	460	**315**	**420**	1800	2000	1475	1200	⑦ ⑧
PDU565C	502	**420**	**565**	1800	2700	1990	1200	⑦ ⑧
PDU425C	6064MK33	**317**	**425**	2100	2000	1475	1350	③ ⑤
PDU450C	6064MK33	**336**	**450**	2100	2100	1550	1350	③ ⑤
PDU475C	6064MK33	**354**	**475**	2100	2100	1550	1350	③ ⑤
PDU525C	6064HK33	**391**	**525**	2100	2375	1750	1350	③ ⑤
PDU550C	6064HK33	**410**	**550**	2100	2375	1750	1350	③ ⑤
PDU575C	6064HK33	**429**	**575**	2100	2375	1750	1350	③ ⑤
PDU475C	6064HV33	**354**	**475**	2100	2102	1550	1350	⑦ ⑧
PDU500C	6064HV33	**373**	**500**	2100	2102	1550	1350	⑦ ⑧
PDU525C	6064HV33	**391**	**525**	2100	2373	1750	1350	⑦ ⑧
PDU550C	6064HV33	**410**	**550**	2100	2373	1750	1350	⑦ ⑧

Optimization: ③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant

PDU includes: Cooling, air intake and exhaust system and mounting base.

All 5A-ratings can be used for 5B/5C applications!

Power*Drive*Unit based on the Series 60, 900, 460, 500 for industrial and mining applications

205 kW - 470 kW (275 bhp - 630 bhp)

> Intake air temperature: 25°C

5C – Short-time duty operation

Engine model	Reference no.	Rated power ICFN			Peak Torque			Optimization
		kW	bhp	rpm	Nm	lb-ft	rpm	
Application (5C)	Short-time duty operation (Load factor > 75%)							
	Air-to-air charge-air cooling							
PDU275C	906	**205**	**275**	2200	1100	810	1200-1600	⑦ ⑧
PDU320C	926	**240**	**320**	2200	1200	885	1200-1600	⑦ ⑧
PDU420C	460	**315**	**420**	1800	2000	1475	1200	⑦ ⑧
PDU565C	502	**420**	**565**	1800	2700	1990	1200	⑦ ⑧
PDU500C	6064MK33	**373**	**500**	2100	2100	1550	1350	③ ⑤
PDU600C	6064HK33	**447**	**600**	2100	2575	1900	1350	③ ⑤
PDU630C	6064HK33	**470**	**630**	2100	2575	1900	1350	③ ⑤
PDU600C	6064HV33	**447**	**600**	2100	2576	1900	1350	⑦ ⑧
PDU630C	6064HV33	**470**	**630**	2100	2576	1900	1350	⑦ ⑧

Optimization: ③ Exhaust emission EPA 40 CFR 89/Tier 2 compliant
⑤ Exhaust emission EU 97/68 EC/Stage II compliant
⑦ Exhaust emission EPA 40 CFR 89/Tier 3 compliant
⑧ Exhaust emission EU 97/68 EC/Stage IIIA compliant

All 5A-ratings can be used for 5B/5C applications!

Automation

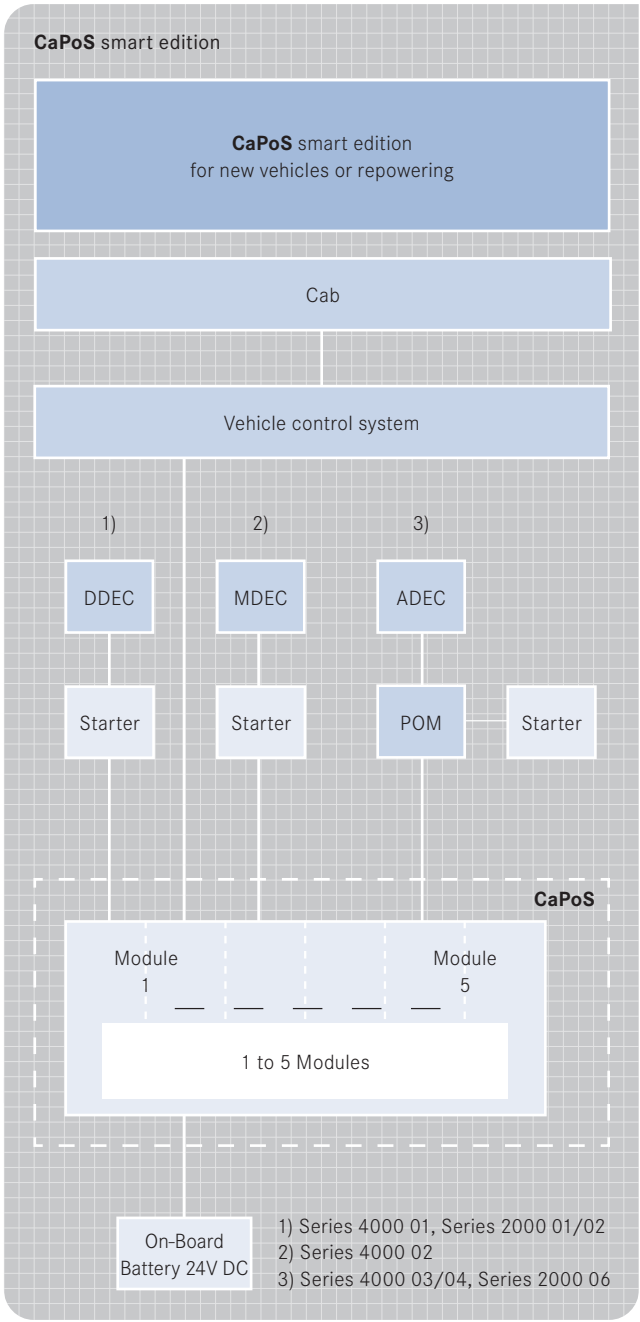
CaPoS smart edition – **Ca**pacitor **Po**wer **S**ystem for Series 2000, 4000

Reliable power right from the start.
CaPoS smart edition was especially developed for heavy and duty applications and provides the high energy required by the 24V DC starters during the starting sequence.

CaPoS uses capacitor technology to optimize startup behavior. The number of modules to be used depends on the type of engine involved and its breakaway torque. CaPoS smart edition may be used autonomously or in conjunction with the **motiv***line* automation system.

The most important features at a glance:
- Autonomous and modular construction
- Maintenance-free system
- Significant reductions in weight and volume compared with conventional starter batteries
- Optimized cold-starting capabilities
- Low life-cycle costs
- No voltage interruption during start-up
- On-board voltage of 24V DC
- Integrated self-monitoring system with interface to vehicle control system
- Integrated DC-/DC converter for automatical recharging
- IP66 protection

CaPoS smart edition



We manage everything for you.

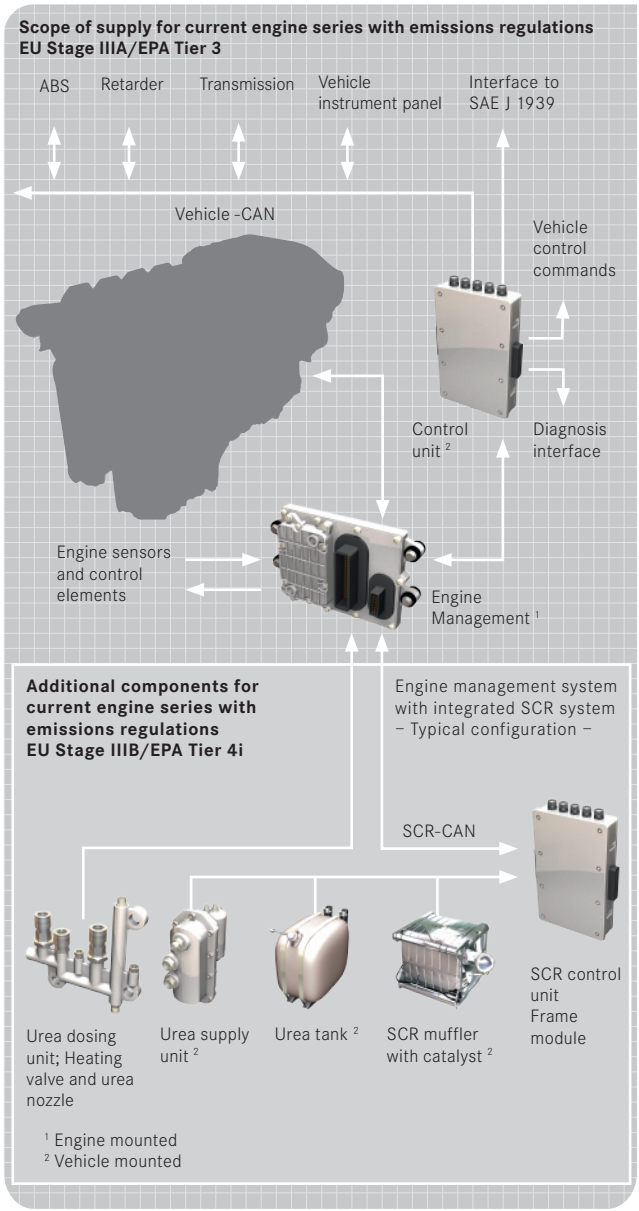
All our engines are equipped with electronic engine controls. Intelligent electronics ensure that performance and efficient operation are achieved under all operating conditions. Innovative, high-end technology takes over the control, regulation and monitoring of the drive system. The systems are modular in order to be able to adapt the diesel engine to the complex optimal operating conditions of the equipment. In addition, operating conditions that could lead to damage are detected in time.

Your benefits:

- Protection of the engine and therefore safety by:
  - Reporting critical operating conditions
  - Temporary reduction in power
  - Automatic shutdown
  - Start inhibitor
  - Over speed regulation
  - Self-diagnosis and regulation for the system
- Standard interfaces for external system connections, such as CAN data bus and SAE J 1939
  - Easy integration with the vehicle
  - Flexible adjustment to the vehicle or vehicle components and project specific needs
  - Interface for engine diagnosis
- High availability and fail-safe operation
- High power efficiency
- Low fuel consumption
- Minimal exhaust emissions that fully meet all legal requirements

For engines equipped with SCR systems, we are your expert technology partner. The latest electronics integrate the necessary SCR components for the reduction of emissions intelligently into the overall system. This ensures optimal tuning of all engine and emission control functions.

Engine management system – Typical configuration Series 460, 500, 900



motiv*line* – the management technology for mining applications with Series 4000-03

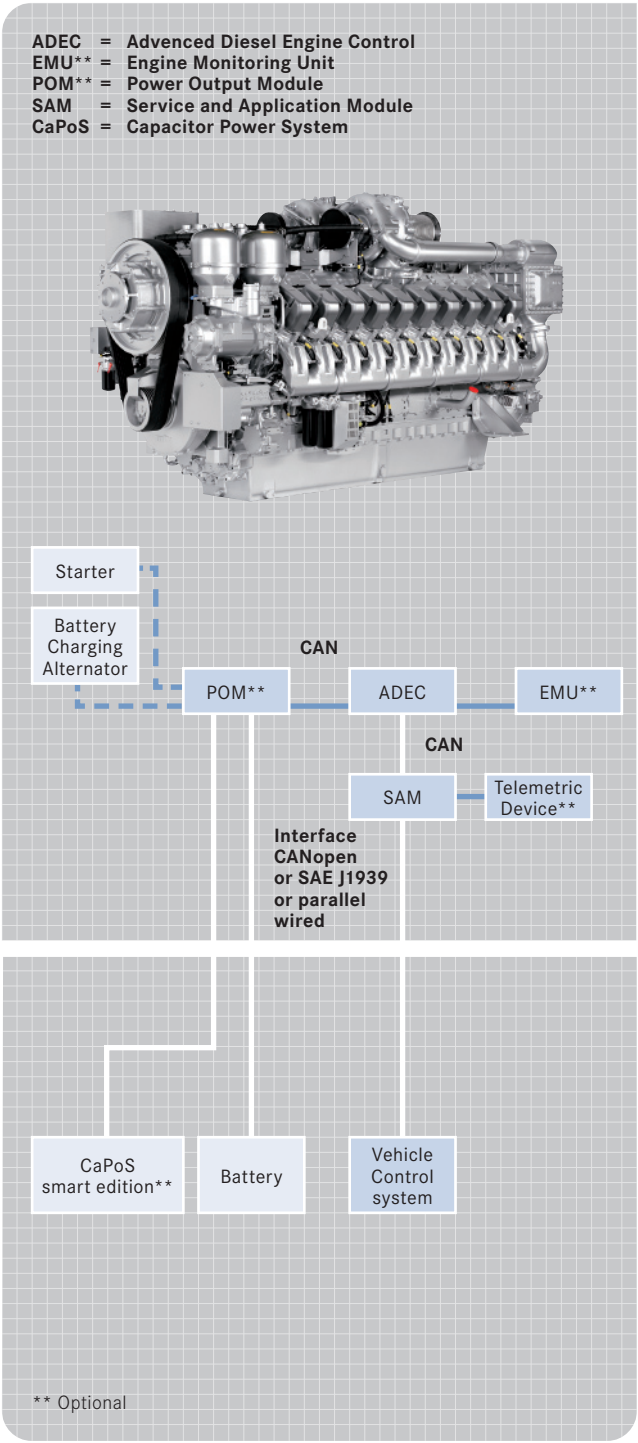
The **motiv***line* automation system is an innovative highend technology developed by MTU for mining vehicles. **motiv***line* performs the control and monitoring functions for the entire engine plant. The modular system guarantees optimum adaptation of the diesel engine to the diversity of operating conditions in mining.

motiv*line* supports:
> flexible adaptation to the vehicle and/or its components and project-specific requirements
> automatic power output adjustment or optional engine shutdown by the integrated safety system and all other necessary monitoring and safety functions
> Interface - MTU telemetric device for GSM* - for MTU **Value**Care Product Remote Services (optional with user agreement), which provides direct access to the data of your MTU engine
> Easy adaptation by means of MTU interface module **SAM**

motiv*line* harmonizes the engine integration into the vehicle. Because of that optimized conditions generates:
> **high power- efficiency**
> **low fuel consumption**
> **minimal exhaust emissions that are substantially below the legal limits**

For the **Series 4000 engines**, a new engine management system **ADEC** has been developed, whilst there is also an extensive range of standardized solutions available - with options for flexible interfaces. The Engine Monitoring Unit **EMU** provides further enhanced availability by means of additional monitoring and diagnostic options for the engine. Complementing the **SAM** interface module, **POM** optimizes the start process and simplifies cabling to the starter and alternator. The complete **Plug & Play** system makes installation of the engine in the vehicle considerably simpler and faster.

* Global System for Mobile Communications



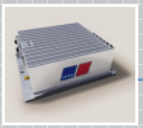
motiv*line* for mining engines based on Series 4000-03

Cab control desk with monitoring and control system

Pedal**

Panel instruments**

Display**

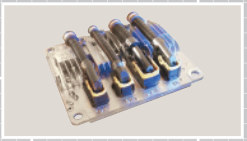


Remote Services**

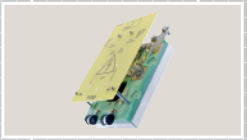
SAM
Service and Applications Module

Engine with control systems

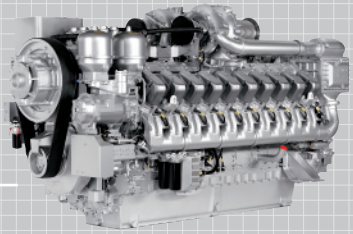
EMU**
Engine Monitoring Unit



ADEC
Engine Management



POM**
Power Output Module

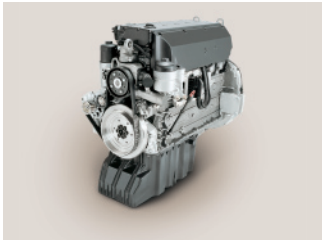


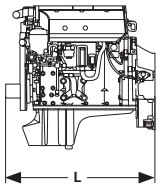
** Optional

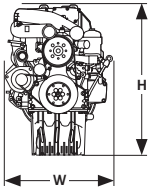
Diesel engine for industrial, agricultural and mining applications

Mercedes-Benz Engineering Excellence

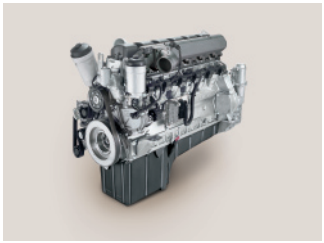
Series 900

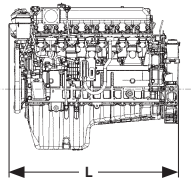


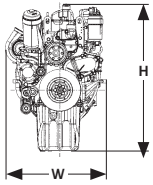




Series 460







Diesel engines for industrial, agricultural and mining applications

Engine	Cylinder data			Dimensions, max.	Mass, max.
	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 C01 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 C01 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 C02 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 C01 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 C01 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 C02 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 C02 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)

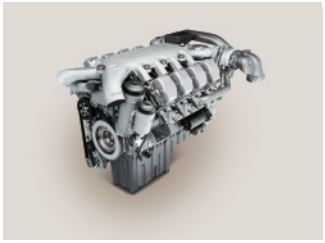
Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing.

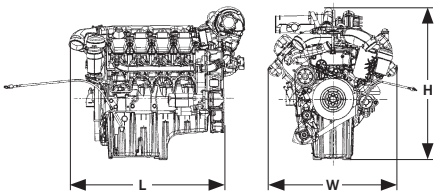
For further information consult your MTU distributor/ dealer.

Diesel engine for industrial, agricultural and mining applications

Mercedes-Benz Engineering Excellence

Series 500





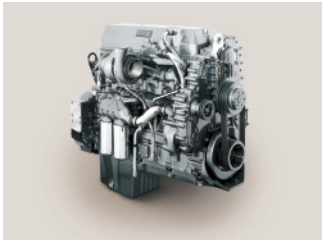
Diesel engines for industrial, agricultural and mining applications

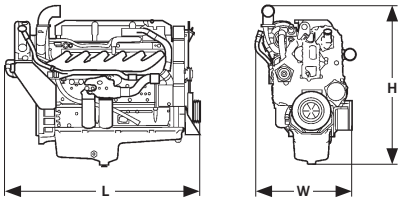
Engine	Cylinder data			Dimensions, max.	Mass, max.
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
6V 501 C01 6 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	12.0 (732)	1206 x 1020 x 1158 (47 x 40 x 46)	885 (1951)
6V 501 C02 6 Cyl./90°V	130/150 (5.1/5.9)	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 C02 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)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial and mining applications

Series 60





Diesel engines for industrial, agricultural and mining applications

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)
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)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial, and mining applications

Series 1000

Series 1100

Series 1300

Series 1500

Diesel engines for industrial and mining applications

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 C00 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 C00 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 C00 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 C00 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 C00 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)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for agricultural applications

Series 1000

Series 1100

Series 1300

Series 1500

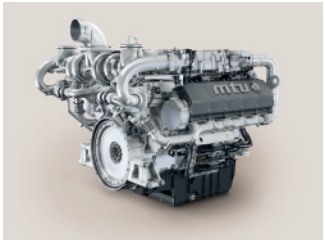
Diesel engines for agricultural applications

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 A00 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 A00 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 A00 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 A00 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 A00 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)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial, and mining applications

Series 1600



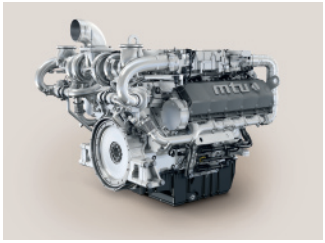
Diesel engines for industrial and mining applications

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 C00 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 C00 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)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for agricultural applications

Series 1600



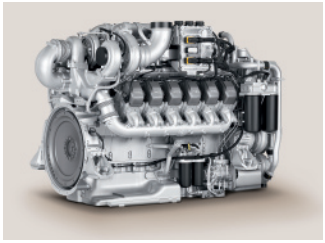
Diesel engines for agricultural applications

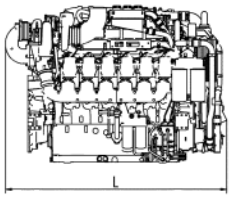
Engine	Cylinder data			Dimensions, max.	Mass, max.	Weight/Power ratio
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)	kg/kW (lbs./bhp)
10V 1600 A00 10 Cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	17.5 (1068)	1707 x 1258 x 1200 (67.2 x 49.5 x 47.2)	1940 (4277)	3.2 - 3.4 (5.3 - 5.6)
12V 1600 A00 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)

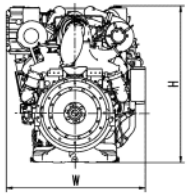
Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial and mining applications

Series 2000







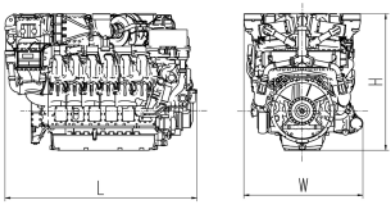
Diesel engines for industrial, agricultural and mining applications

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)
12V 2000 C02 12 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)	1864 x 1205 x 1286 (73.4 x 47.4 x 50.6)	2416 (5326)	3.2 - 4.3 (5.3 - 7.0)
16V 2000 C02 16 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.9 (1947)	2360 x 1247 x 1314 (93 x 49,1 x 51,7)	2994 (6601)	3.0 - 3.8 (4.9 - 6.3)
12V 2000 C06 12 Cyl./90°V	135/156 (5.3/6.2)	2.23 (136)	26.8 (1633)	2028 x 1278 x 1461 (79.8 x 50.3 x 57.5)	2950 (6503)	3.8 (6.2)
16V 2000 C06 16 Cyl./90°V	135/156 (5.3/6.2)	2.23 (136)	35.7 (2177)	2378 x 1288 x 1488 (93.6 x 50.7 x 58.6)	3350 (7385)	3.5 (5.7)
12V 2000 C07 12 Cyl./90°V	135/156 (5.3/6.2)	2.23 (136)	26.8 (1633)	2028 x 1278 x 1461 (79.8 x 50.3 x 57.5)	2950 (6503)	3.8 - 5.3 (6.2 - 8.6)
16V 2000 C07 16 Cyl./90°V	135/156 (5.3/6.2)	2.23 (136)	35.7 (2177)	2378 x 1288 x 1488 (93.6 x 50.7 x 58.6)	3350 (7385)	3.5 (5.7)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial and mining applications

Series 4000



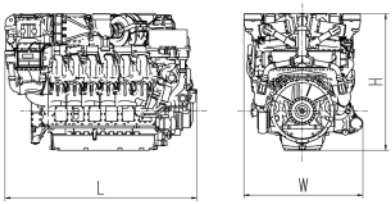
Diesel engines for industrial and mining applications

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)
12V 4000 C01 12 Cyl./90°V	165/190 (6.5/7.5)	4.06 (248)	48.8 (2978)	2409 x 1588 x 1736 (94.8 x 62.5 x 68.3)	6045 (13325)	4.0 - 5.1 (6.6 - 8.3)
16V 4000 C01 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)	3.5 - 4.4 (5.8 - 7.3)
20V 4000 C02 20 Cyl./90°V	165/210 (6.5/8.3)	4.49 (274)	89.8 (5480)	3647 x 1609 x 2065 (143.6 x 63.3 x 81.3)	9865 (21750)	3.6 (6.0)
12V 4000 C03 12 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.3 (3493)	2497 x 1629 x 2065 (98.3 x 64.1 x 81.3)	7000 (15430)	4.2 - 5.9 (6.8 - 9.7)
16V 4000 C03 16 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4656)	3020 x 1629 x 2065 (118.9 x 64.1 x 81.3)	8100 (17860)	3.6 - 5.4 (6.0 - 8.9)
20V 4000 C03 20 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	95.4 (5822)	3647 x 1609 x 2065 (143.6 x 63.3 x 81.3)	10700 (23590)	3.6 - 4.5 (6.0 - 7.4)
12V 4000 C04 12 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.3 (3493)	2633 x 1631 x 1997 (103.7 x 64.2 x 78.6)	7960 (17549)	4.3 (7.0)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Diesel engine for industrial and mining applications

Series 4000



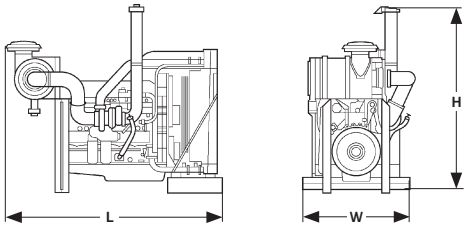
Diesel engines for industrial and mining applications

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)
12V 4000 C05 12 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)	2633 x 1631 x 1997 (103.7 x 64.2 x 78.6)	7960 (17549)	4.3 - 6.9 (7.0 - 11.4)
16V 4000 C05 16 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4656)	3201 x 1631 x 1997 (126.0 x 64.2 x 78.6)	9350 (20613)	4.1 - 4.9 (6.7 - 8.0)
20V 4000 C05 20 Cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	95.3 (5816)	3722 x 1631 x 2001 (146.5 x 64.2 x 78.8)	11250 (24802)	3.9 - 4.2 (6.4 - 6.9)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

Power*Drive*Unit for industrial and mining applications

PDU - S60



Power*Drive*Unit for industrial and mining applications

Engine	Cylinder data			Dimensions, max.	Mass, max.
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Total displac. l (cu in)	L x W x H mm (in)	(dry) kg (lbs.)
PDU 906 6 Cyl./In-line	102/130 (4.0/5.1)	1.06 (65)	6.4 (391)	2360 x 1215 x 2070 (93 x 48 x 81)	1140 (2513)
PDU 926 6 Cyl./In-line	106/136 (4.2/5.4)	1.20 (73)	7.2 (439)	2360 x 1215 x 2070 (93 x 48 x 81)	1140 (2513)
PDU 460 6 Cyl./In-line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)	2260 x 1140 x 2065 (89 x 45 x 81)	1560 (3432)
PDU 502 8 Cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	15.9 (970)	2455 x 1640 x 2445 (96 x 64 x 96)	2200 (4850)
PDU S60 6 Cyl./In-line	130/160 (5.1/6.3)	2.12 (129)	12.7 (775)	2500 x 1320 x 2110 (98 x 52 x 83)	1750 (3850)
PDU S60 6 Cyl./In-line	133/168 (5.2/6.6)	2.33 (142)	14.0 (854)	2500 x 1320 x 2110 (98 x 52 x 83)	1840 (4050)

Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installation drawing. For further information consult your MTU distributor/dealer.

MTU **Value**Care

World-class support for world-class engines.

By choosing MTU, you're making a wise investment. Get the most out of it with MTU **Value**Care – our full portfolio of products and services specifically designed to maximize your engine's performance, uptime and value.

MTU **Value**Care is provided through three product lines:

- **Value**Service:
  Extensive maintenance, repair and service 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 equipment 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.

Maintenance, Repair and Overhaul

Count on MTU's reliability and expertise – around the world and around the clock. With a wide range of maintenance and repair options, our staff of trained professionals are committed to meeting your needs quickly and efficiently.

And when it's time to give your original engine a powerful new life, individual MTU Overhauls provide proven MTU quality and performance – at a price that can fit your budget. The process is designed to get your engine running as quickly as possible, with the same MTU parts, publications, online tools and service products as new engines.

Technical Documentation *– Helps you maximize performance and uptime by delivering complete, clear information tailored to the specific needs of each engine for effective operation and maintenance.*

Training *– Ensures reliable operations by keeping your maintenance team proficient with MTU engines and systems. MTU training centers are equipped with engines, sub-assemblies, electronics systems and expert trainers for a hands-on learning experience.*

Maintenance Solutions for Series 2000 and Series 4000 mining engines

Extended Coverage – Delivers peace of mind by providing coverage of unexpected repairs beyond your standard warranty, tailored specifically to meet your needs. During the extended coverage period, the cost of materials and labor are covered. All repairs are performed by knowledgeable MTU professionals.

Customized Care – Makes it easy to plan the cost of maintenance and maximize availability throughout your engine's lifecycle. The details, terms and periods of our professional Maintenance and Repair Contracts (MARC) are tailored to your individual needs, ensuring predictable costs and scheduled maintenance. All work is performed by MTU-certified technicians, using only genuine new or remanufactured spare parts.

Customized Care (Preventive) – Covers all planned maintenance activities according to MTU Maintenance Schedule to obtain best engine availability.

Customized Care (All-Inclusive) – Includes all unscheduled, corrective maintenance activities in addition to preventive maintenance.

Scope of Coverage	Customized Care (MARC)		Extended Coverage
	Preventive	All Inclusive	Warranty Extensions
Series	2000/4000	2000/4000	2000/4000
Parts and labor	✓	✓	✓
Preventive Maintenance	✓	✓	✗
Major Overhaul	✓	✓	✗
Repairs	✗	✓	✓
Duration	Upon customer request	Upon customer request	1 year after the standard MTU warranty period

✓ applicable
✗ not applicable

MTU **Value**Care

World-class support for world-class engines.

Remote Services for MTU Mining engines and systems
Remote Services helps you identify faults early, save valuable service time and make quick decisions regarding operational issues. By linking you directly to a record of your MTU engines and systems activity through a secure Internet connection in near real-time, important engine data including oil temperature, current location and operating hours can be conveniently retrieved for analysis – even thousands of miles from the mining site.

Errors are detected early, so corrective measures can be taken. Service planners can also be notified of any error messages, significantly reducing response times. With MTU eCall, automatic e-mail alerts are available at no additional cost.

Remote Services can be ordered as an option on an MTU engine. If you already have an MTU engine, Remote Services is also available as a retrofit. Minimum duration for Remote Services User Agreement is two years, which automatically extends every six months.

ValueSpares
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 designed, 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.

Putting our parts and consumables to work is easy. Whether it's spare parts or oils, coolants and filters, **Value**Spares products are available worldwide through our MTU service network.

ValueExchange
ValueExchange remanufactured parts, engines and systems 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.

For detailed information on MTU **Value**Care products and services, please contact your local MTU service center.

EU - Nonroad-Directive 97/68/EC
(as amended by 2004/26/EC)

Diesel engines

Power Pn kW	NOx g/kWh	HC g/kWh	CO g/kWh	Particul. g/kWh	Date*
	NOx + NMHC				
Stage II					
18 ≤ Pn < 37	8.0	1.5	5.5	0.8	2001
37 ≤ Pn < 75	7.0	1.3	5.0	0.4	2004
75 ≤ Pn < 130	6.0	1.0	5.0	0.3	2003
130 ≤ Pn ≤ 560	6.0	1.0	3.5	0.2	2002
Stage IIIA					
19 ≤ Pn < 37	7.5	7.5	5.5	0.6	2007
37 ≤ Pn < 75	4.7	4.7	5.0	0.4	2008
75 ≤ Pn < 130	4.0	4.0	5.0	0.3	2007
130 ≤ Pn ≤ 560	4.0	4.0	3.5	0.2	2006
Stage IIIB					
19 ≤ Pn < 37	4.7	4.7	5.0	0.025	2013
37 ≤ Pn < 75	3.3	0.19	5.0	0.025	2012
75 ≤ Pn < 130	3.3	0.19	5.0	0.025	2012
130 ≤ Pn ≤ 560	2.0	0.19	3.5	0.025	2011
Stage IV					
56 ≤ Pn < 130	0.4	0.19	5.0	0.025	10/2014
130 ≤ Pn < 560	0.4	0.19	3.5	0.025	2014

* Date for placing on the market, type approval one year earlier

Exhaust emissions

> **Engines above 560 kW rated power are not affected**
> Test cycle stationary: ISO 8178-4, C1/D2 (acc. to engine operation)
> Test cycle transient: NRTC (not until Stage IIIB)
> Test condition: 25°C air temp.
> **NTE** (Not To Exceed): Starting with Stage IIIB upper limits in the performance map will be applied (max. 100% above cycle limit, details will be fixed later)
> For constant speed engines (e.g. mobile gensets) the limits of Stage II will be applied as of 2007, the limits of Stage IIIA as of 2011 (Stage IIIB and IV not yet fixed for these engines)
> For agricultural tractors Directive 2000/25/EC (as amended by 2005/15/EC) is effective, the emission limits are the same.
> As of Stage IIIA compliance with the limits must be proved over the useful life span of the engine
> As of 2006, rail and marine engines are included to 97/68/EC

Japan
Limits for 'Special Motor Vehicles' of the Ministry of Transport (MOT):

Power Pn kW	NOx g/kWh	HC g/kWh	CO g/kWh	Particul. g/kWh	Smoke %	Date* 1.10...
	NOx + NMHC					
Tier 1						
19 ≤ Pn < 37	8.0	5.5	1.5	0.8	40	2004
37 ≤ Pn < 75	7.0	5.0	1.3	0.4	40	2004
75 ≤ Pn < 130	6.0	5.0	1.0	0.3	40	2004
130 ≤ Pn ≤ 560	6.0	3.5	1.0	0.2	40	2004
Tier 2 (planned)						
19 ≤ Pn < 37	6.0	5.0	1.0	0.4	40	2007
37 ≤ Pn < 56	4.0	5.0	0.7	0.3	35	2008
56 ≤ Pn < 75	4.0	5.0	0.7	0.25	30	2008
75 ≤ Pn < 130	3.6	5.0	0.4	0.2	25	2007
130 ≤ Pn ≤ 560	3.6	3.5	0.4	0.17	25	2006

> Test cycle: ISO 8178-4, C1

Exhaust emissions

USA - EPA Nonroad Regulation
40 CFR 89, 40 CFR 1039 and 40 CFR 1068

Diesel engines

Power Pn kW	NOx g/kWh	HC g/kWh	CO g/kWh	Particul. g/kWh	as of MY*
	NOx + NMHC				
Tier 1					
Pn > 560	9.2	1.3	11.4	0.54	2000
Tier 2					
19 ≤ Pn < 37	7.5	7.5	5.5	0.6	2004
37 ≤ Pn < 75	7.5	7.5	5.0	0.4	2004
75 ≤ Pn < 130	6.6	6.6	5.0	0.3	2003
130 ≤ Pn ≤ 225	6.6	6.6	3.5	0.2	2003
225 ≤ Pn ≤ 450	6.4	6.4	3.5	0.2	2001
450 ≤ Pn ≤ 560	6.4	6.4	3.5	0.2	2002
Pn > 560	6.4	6.4	3.5	0.2	2006
Tier 3					
19 ≤ Pn < 37	no further reduction				
37 ≤ Pn < 75	4.7	4.7	5.0	0.4	2008
75 ≤ Pn < 130	4.0	4.0	5.0	0.3	2007
130 ≤ Pn ≤ 560	4.0	4.0	3.5	0.2	2006
Pn > 560	no further reduction				
Tier 4 interim					
19 ≤ Pn < 37	7.5	7.5	5.5	0.3	2008
37 ≤ Pn < 56	4.7	4.7	5.0	0.03	2008
56 ≤ Pn < 130	3.4	0.19	5.0	0.02	2012
130 ≤ Pn ≤ 560	2.0	0.19	3.5	0.02	2011
Pn > 560	3.5	0.4	3.5	0.1	2011
Tier 4 interim - Genset					
Pn > 900	0.67	0.4	3.5	0.1	2011
Tier 4					
19 ≤ Pn < 37	4.7	4.7	5.5	0.03	2013
37 ≤ Pn < 56	4.7	4.7	5.0	0.03	2013
56 ≤ Pn < 130	0.4	0.19	5.0	0.02	2014
130 ≤ Pn ≤ 560	0.4	0.19	3.5	0.02	2014
Pn > 560	3.5	0.19	3.5	0.04	2015
Tier 4 - Genset					
Pn > 560	0.67	0.19	3.5	0.04	2015

* Optional for Tier 3/4: 37-56 kW - PM = 0.3 g/kWh as of 2008; 56-560 kW.- Phase in/Phase out

- In addition to the particulate measurement, a transient smoke test is required (see chapter 6); as of Tier 4 this applies to engines with particulate emissions above 0.07 g/kWh only; engines which operated at constant speed are generally excluded
- Stationary test cycle: ISO 8178-4, C1/D2/E3; as of Tier 4, the appropriate Ramped Mode Cycle may be used alternatively
- Transient test cycle: NRTC; all engines as of Tier 4, except engines above 560 kW and constant speed engines of any power category
- Test condition: 25°C air temp.
  as of Tier 4: 20°C - 30°C air temp.,
  ambient pressure 0.8 - 1.03 bar
- Compliance with the limits must be guarabteed over the useful life period of the engine
- ABT (Averaging, Banking and Trading) of emission credits is allowed
- NTE (Not To Exceed) effective dates:
  2011 for engines > 130 kW,
  2012 for engines 56 - 160 kW,
  2013 for engines < 56 kW.
  NTE limits are set 1.25 to 1.5 times the cycle limit.
  NTE limits apply at time of certification throughout the useful life of the engine.

India

proposed (but not yet finalized) is the adoption of the EU-Nonroad-limits. Stage II as of 2007, stage IIIA as of 2011.

Notice

Notice

Notice

Further special sales programs:

– Marine
– Rail
– Gendrive
– Oil & Gas

Conversion Table

1 kW	= 1.360 PS	g	= 9.80665 m/s²
1 kW	= 1.341 bhp	π	= 3.14159
1 HP	= 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/HPh	= 447.3 g/PSh	1 ft lb	= 1.356 Nm
1 lb/HPh	= 608.3 g/kWh	1 ft/min	= 0.00508 m/s
1 gal/HPh(US)	= 4264 g/kWh	pDiesel	= 0.83 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 WS	= 0.0981 mbar (9.81 Pa)
1 inch	= 2.540 cm	T (K)	= t (°C) + 273.15
1 sq. inch	= 6.542 cm²	t (°C)	= 5/9 x (t (°F) -32)
1 cu. inch	= 16.387 cm³	t (°C)	= 5/4 x t (°R)
1 foot	= 3.048 dm	1 foot	= 12 inches
1 sq. foot	= 9.290 dm²	1 yard	= 3 feet
1 land mile	= 1.609 km	1 land mile	= 5280 feet
1 naut. mile	= 1.853 km	1 naut. mile	= 6080 feet
1 GB Gallon	= 4.546 l		
1 US Gallon	= 3.785 l		
1 US Barrel	= 0.159 m³		
	= 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)	$= \frac{P_{ges}(kW) \times 30000}{n(1/min) \times \pi}$

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Subject to change. | 3190241 | Edition 01/15 | ENC 2015-01 CM | Printed in Germany on chlorine-free bleached paper.