



Oil & Gas Industry

# SOLUTION GUIDE

Edition 1/19, valid from 10/2019



A Rolls-Royce  
solution



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## PIONEERING THE POWER THAT MATTERS

Rolls-Royce provides world-class power solutions and complete life-cycle support under our product and solution brand MTU. Through digitalization and electrification, we strive to develop drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by the rapidly growing societal demands for energy and mobility. We deliver and service comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems. These clean and technologically-advanced solutions serve our customers in the marine and infrastructure sectors worldwide.

### A solution provider

MTU systems power the largest yachts, the strongest tugboats and the biggest land vehicles and provide energy for the world's most important mission-critical applications. Through advanced solutions such as microgrids, we integrate renewable energies and manage the power needs of our customers.

Our customized service offerings help you maximize uptime and performance and are supported by our digital solutions, which enable remote monitoring, predictive maintenance and a range of other benefits that keep your systems running at their best.

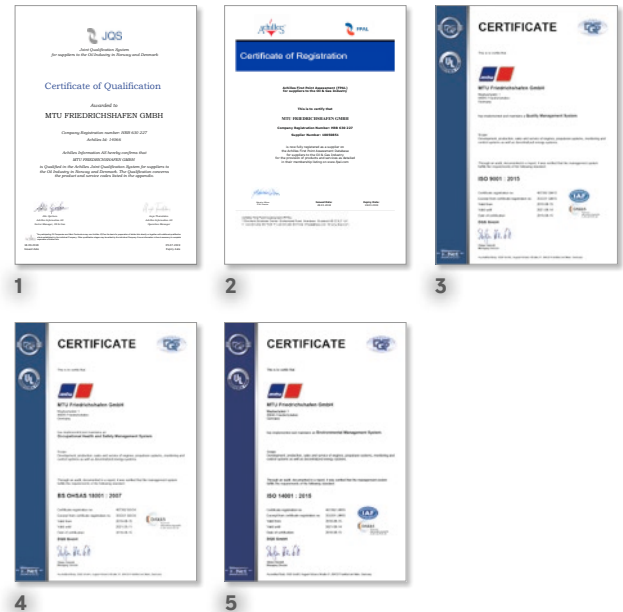
For over 110 years, we have provided innovative power solutions for our customers – meeting even the most demanding drive requirements. Our products and services span a wide range of applications and power needs, with both standard and customized options.

### An expert in technology

As part of Rolls-Royce, we have long been known for cutting-edge innovation and technological leadership in product development. That same spirit of innovation inspires our sustainability efforts. Our focus is on developing and implementing system solutions that both maximize efficiency and reduce emissions -- which in turn work to reduce our impact on the environment.

### A passionate and reliable partner

We at Rolls-Royce spend every day working together with our customers, to deliver engines, systems and complete life-cycle solutions that best fit your needs. We understand that each application is different and has its own specific demands. Our engineers embrace the challenge of finding the perfect solution for your unique power requirements. Every step of the way – from project planning, through design, delivery and commissioning; to the lifetime care of your equipment – we are dedicated to helping you get the most from your investment.



1 Achilles JQS

2 Achilles FPAL

3 QMS ISO 9001:2015

4 BS OHSAS ISO 18001:2007

5 EMS ISO 14001:2015

## 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 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)

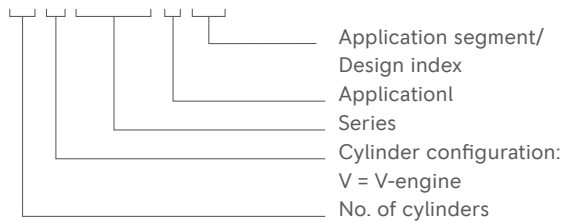
**Information about further technical data and classification requirements e.g. DNV, ABS, RS, BV, LR, GL and ATEX Zone 2 are available on request.**

We apply 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 distributor for current information and binding data.

## EXPLANATION OF THE ENGINE DESIGNATION

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

**16 V 4000 P 63**



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

For further information about our Oil & Gas products  
please contact your distributor/dealer or visit:  
[www.mtu-solutions.com](http://www.mtu-solutions.com)

On-Highway engine  
from Mercedes-Benz:

OM 934  
OM 936  
OM 470  
OM 471  
OM 473

Our Off-Highway  
engine:

MTU 4R 1000  
MTU 6R 1000  
MTU 6R 1100  
MTU 6R 1300  
MTU 6R 1500

## Selection Guideline

## TYPICAL APPLICATIONS

**3A/50 Hz - Diesel engines for continuous power**

Rating definition: Continuous operation - 100% load

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

**3B/50 Hz - Diesel engines for prime power**

Rating definition: Continuous operation - variable load

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

**3C/50 Hz - Diesel engines for prime power limited**

Rating definition: Standby operation - variable load

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

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

**515 – 2245 kW**

Load factor  $\leq$  100%

**Page**

Rating definition: ICXN, 10% overload capability

18 - 19

**407 – 2807 kW**

Load factor < 75%

Rating definition: ICXN, 10% overload capability

20 - 23

**1560 – 2600 kW**

Load factor < 75%

Rating definition: ICXN, 10% overload capability

24 - 25

## Selection Guideline

## TYPICAL APPLICATIONS

**3A/60 Hz - Diesel engines for continuous power**

Rating definition: Continuous operation - 100% load

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

**3B/60 Hz - Diesel engines for prime power**

Rating definition: Continuous operation - variable load

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

**3C/60 Hz - Diesel engines for prime power limited**

Rating definition: Standby operation - variable load

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

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

**870 – 2490 kW**

Load factor  $\leq$  100%

**Page**

Rating definition: ICXN, 10% overload capability

26 - 27

**465 – 3010 kW**

Load factor  $<$  75%

Rating definition: ICXN, 10% overload capability

28 - 31

**1680 – 2800 kW**

Load factor  $<$  75%

Rating definition: ICXN, 10% overload capability

32 - 33

## Selection Guideline

## TYPICAL APPLICATIONS

**4A - Diesel engines for heavy duty operation**

Rating definition: Continuous operation - 100% load

Mechanical power for draw works, mudpumps, cementers, sanding units, and workover rigs.

Operating hours: unrestricted

**4B - Diesel engines for medium duty operation**

Rating definition: Continuous operation - variable load

Mechanical power for draw works, mudpumps, hydration units, sanding units, blenders, cranes and workover rigs.

Operating hours: unrestricted

**4C - Diesel engines for short time duty operation**

Rating definition: Short-time operation - variable load

Mechanical power for coil tubing units, nitrogen units and fire pumps.

Operating hours: max. 1000 hours per year

**4D - Diesel engines for frac operation**

Rating definition: Continuous operation - low load

Mechanical power for frac pumps.

Operating hours: max. 2000 hours per year

**Systems solutions**

Electric Drilling Package (EDP)

FracPack System

**75 – 1865 kW**

Load factor &gt; 60%

**Page**

Rating definition: Fuel stop, ICFN

36 - 45

**110 – 970 kW**

Load factor &lt; 60%

Rating definition: Fuel stop, ICFN

46 - 55

**447 – 496 kW**

Load factor &lt; 40%

Rating definition: Fuel stop, ICFN

56 - 57

**858 – 2461 kW**

Load factor &lt; 40%

Rating definition: Fuel stop, ICFN

58 - 59

**1105 – 1939 kW**

62 - 63

64 - 65

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



## DIESEL ENGINES FOR GENERATOR DRIVE



1 Photo: Øyvind Hagen/Statoil

## Diesel engines for generator drive

515 – 2245 KW  
(691 – 3011 BHP)

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

## 3A/50 Hz – Continuous power

Series 2000

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization
	kW	bhp	
12V 2000 G65	515	691	X
16V 2000 G65	655	878	X
18V 2000 G65	720	966	X

Series 4000

12V 4000 B24F	1310	1757	X
12V 4000 P63 <sup>1)</sup>	1350	1810	18
16V 4000 B24F	1635	2193	X
16V 4000 P63 <sup>1)</sup>	1800	2414	18
20V 4000 B24F	2000	2682	X
20V 4000 B34F	2200	2950	X
20V 4000 P63 <sup>1)</sup>	2245	3011	18

Optimization: X Fuel consumption optimized  
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

Cooling variant	Cooling pack. included
A2A	yes
A2A	yes
A2A	yes
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	

## Diesel engines for generator drive

407 – 695 kW  
(546 – 932 BHP)

## 3B/50 Hz – Prime power

Series 1600

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization
	kW	bhp	
10V 1600 G10F	407	546	X, 1, 8, 24, 25
10V 1600 G20F	448	601	X, 1, 8, 24, 25
12V 1600 G10F	524	703	X, 1, 24, 25
12V 1600 G20F	576	772	X, 1, 24, 25

Series 2000

12V 2000 G25	580	778	X, 1
12V 2000 G25	580	778	X
12V 2000 G65	695	932	X, 1

Optimization:	X	Fuel consumption optimized
	1	TA-Luft optimized (Diesel)
	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)

Cooling variant	Cooling pack included
A2A	yes
A2A	yes
A2A	yes
A2A	yes
A2A	yes
W2A	
A2A	yes

## Diesel engines for generator drive

# 890 – 2807 kW

## (1194 – 3764 BHP)

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

## 3B/50 Hz – Prime power

Series 2000

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization
	kW	bhp	
16V 2000 G65	890	1194	X, 1,
18V 2000 G65	1000	1341	X, 1

Series 4000

12V 4000 G14RF	1205	1616	X, 1, 24, 31
12V 4000 G14F	1420	1904	X, 1, 24, 31
12V 4000 P63 <sup>1)</sup>	1560	2092	18
12V 4000 G24F	1575	2112	X, 1, 24, 31
16V 4000 G14F	1798	2411	X, 1, 24, 31
16V 4000 G24F	1965	2635	X, 1, 24, 31
16V 4000 P63 <sup>1)</sup>	2080	2789	18
20V 4000 G14F	2200	2950	X, 1, 24, 31
20V 4000 G34F	2590	3473	X, 24, 31
20V 4000 P63 <sup>1)</sup>	2600	3487	18
20V 4000 G44F	2807	3764	X, 24, 31, 36

Optimization:	X	Fuel consumption optimized
	1	TA-Luft optimized (Diesel)
	18	IMO II
	24	NEA Singapore for ORDE
	31	China NRMM Stage III (GB20981-2014)
	36	EPA Nonroad Tier 2 compliant

## 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

Cooling variant	Cooling package
A2A	yes
A2A	yes
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	

Diesel engines for generator drive

1560 – 2600 kW  
(2092 – 3487 BHP)

### 3C/50 Hz – Prime power limited

Engine model	Rated power ICXN 50 Hz - 1500 rpm		Optimization
	kW	bhp	
12V 4000 P63 <sup>1)</sup>	1560	2092	18
16V 4000 P63 <sup>1)</sup>	2080	2789	18
20V 4000 P63 <sup>1)</sup>	2600	3487	18

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

Cooling variant	Cooling package
W2A	
W2A	
W2A	

Series 4000

## Diesel engines for generator drive

870 – 2490 kW  
(1167 – 3339 BHP)

## 3A/60 Hz – Continuous power

Series 4000

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization
	kW	bhp	
12V 4000 G73 <sup>2)</sup>	870	1167	19
16V 4000 G73 <sup>2)</sup>	1140	1529	19
12V 4000 B14S	1190	1596	X
12V 4000 B24S	1420	1904	X
12V 4000 P83 <sup>1)</sup>	1455	1951	18
16V 4000 B14S	1680	2253	X
16V 4000 P83 <sup>1)</sup>	1940	2602	18
16V 4000 B24S	1950	2615	X
20V 4000 B24S	2230	2990	X
20V 4000 P83 <sup>1)</sup>	2425	3252	18
20V 4000 B44S	2490	3339	18

Optimization: X Fuel consumption optimized  
 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

Cooling variant	Cooling pack. included
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	

## Diesel engines for generator drive

465 – 810 kW  
(624 – 1086 BHP)

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

## 3B/60 Hz – Prime power

Series 1600

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization
	kW	bhp	
10V 1600 G10S	465	624	X
10V 1600 G20S	511	685	19
12V 1600 G10S	561	752	19
12V 1600 G20S	608	815	19

Series 2000

12V 2000 G45	710	952	19
12V 2000 G85	810	1086	19
12V 2000 G85	810	1086	19

Optimization: X Fuel consumption optimized  
19 EPA Nonroad T2 Comp (40CFR89)

Cooling variant:

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

Cooling variant	Cooling pack. included
A2A	yes
A2A	yes
A2A	yes
A2A	yes
W2A	
A2A	yes
W2A	

## Diesel engines for generator drive

1010 – 3010 kW  
(1354 – 4036 BHP)

## 3B/60 Hz – Prime power

Series 2000

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization
	kW	bhp	
16V 2000 G85	1010	1354	19
16V 2000 G85	1010	1354	19

Series 4000

12V 4000 G73 <sup>2)</sup>	1105	1482	19
16V 4000 G73 <sup>2)</sup>	1390	1864	19
12V 4000 G14S	1520	2038	X, 19
12V 4000 P83 <sup>1)</sup>	1680	2253	18, 19
12V 4000 G24S	1736	2328	X, 19
16V 4000 G14S	2020	2709	X, 19
16V 4000 P83 <sup>1)</sup>	2240	3004	18, 19
16V 4000 G24S	2280	3058	X, 19
20V 4000 G14S	2490	3339	X, 19
20V 4000 G24S	2740	3674	X, 19
20V 4000 P83 <sup>1)</sup>	2800	3755	18, 19
20V 4000 G44S	3010	4036	X, 19

Optimization: X Fuel consumption optimized  
 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

Cooling variant	Cooling package
A2A	yes
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	
W2A	



Diesel engines for generator drive

1680 – 2800 KW  
(2253 – 3755 BHP)

### 3C/60 Hz – Prime power limited

Engine model	Rated power ICXN 60 Hz - 1800 rpm		Optimization
	kW	bhp	
12V 4000 P83 <sup>1)</sup>	1680	2253	
16V 4000 P83 <sup>1)*</sup>	2240	3004	
20V 4000 P83 <sup>1)</sup>	2800	3755	18, 19

Optimization: 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

Cooling variant	Cooling package
W2A	
W2A	
W2A	

## DIESEL ENGINES FOR MECHANICAL DRIVE



## Diesel engines for mechanical drive

75 – 295 kW  
(101 – 396 BHP)

> Intake air temperature: 25°C

## 4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 904 C21	75	101	2200	A2A
4R 904 C31	90	121	2200	A2A
4R 924 C22	95	127	2200	A2A
6R 906 C21	130	174	2200	A2A
6R 906 C31	150	201	2200	A2A
6R 926 C22	175	234	2200	A2A
6R 926 C32	195	261	2200	A2A
Series 900				
6R 460 C11R	220	295	1800	A2A
6R 460 C11	242	324	1800	A2A
6R 460 C21	260	349	1800	A2A
6R 460 C31	295	396	1800	A2A
6R 460 C22	265	355	1800	A2A
6R 460 C32	295	396	1800	A2A

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)
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 (application group 5).

manufactured by



customized by



Peak torque			Optimization
Nm	lb-ft	rpm	
400	295	1200-1600	20, 23, 31
470	345	1200-1600	20, 23, 31
500	370	1200-1600	38, 39
675	500	1200-1600	20, 23, 31
750	555	1200-1600	20, 23, 31
850	625	1200-1600	38, 39
1020	750	1200-1600	38, 39
Series 460			
1300	960	1300	20, 23, 31
1600	1180	1300	20, 23, 31
1750	1290	1300	20, 23, 31
1900	1400	1300	20, 23, 31
1750	1290	1300	29, 38, 39
1900	1400	1300	29, 38, 39

## Diesel engines for mechanical drive

242 – 336 kW  
(325 – 450 BHP)

## 4A – Heavy duty operation

Series 60

Engine model	Reference no.	Rated power ICFN		
		kW	bhp	rpm
S60 (14.0 l)	6063HV39	242	325	2100
	6063HV39	280	375	2100
	6063HV39	298	400	2100
	6063HV39	317	425	2100
	6063HV39	336	450	2100

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

Cooling variant:

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

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

4A ratings can be used for 4B applications.

For additional power ratings please consult your distributor/dealer.

Cooling variant	Peak torque			Optimization
	Nm	lb-ft	rpm	
A2A	1559	1150	1350	20, 23
A2A	1830	1350	1350	20, 23, 31
A2A	1958	1444	1350	20, 23
A2A	2000	1475	1350	20, 23, 31
A2A	2102	1550	1350	20, 23, 31

## Diesel engines for mechanical drive

100 – 400 kW  
(134 – 536 BHP)

&gt; Intake air temperature: 25°C

manufactured by



customized by



## 4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 1000 C10	100	134	2200	A2A
4R 1000 C20	115	154	2200	A2A
4R 1000 C30	129	173	2200	A2A
6R 1000 C20	180	241	2200	A2A
6R 1000 C30	210	282	2200	A2A
6R 1100 C30	280	375	1700	A2A
6R 1300 C20	320	429	1700	A2A
6R 1300 C30	340	456	1700	A2A
6R 1500 C30	400	536	1700	A2A

Optimization: 21 EPA Nonroad T4 (40CFR1039)  
 27 EU Nonroad St IV (97/68/EC) Compliant  
 40 UN ECE R96 Emission Flex Package (EFP)

Cooling variant:

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

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

4A ratings can be used for 4B applications.

Peak torque			Optimization
Nm	lb-ft	rpm	
600	443	1200-1500	21, 27, 40
675	498	1200-1500	21, 27, 40
750	553	1200-1600	21, 27, 40
1000	738	1200-1600	21, 27, 40
1150	848	1200-1600	21, 27, 40
1900	1401	1300	21, 27, 40
2100	1549	1300	21, 27, 40
2200	1623	1300	21, 27, 40
2600	1918	1300	21, 27, 40

Series 1500 // 1300 // 1100 // 1000

## Diesel engines for mechanical drive

115 – 400 kW  
(154 – 536 BHP)

&gt; Intake air temperature: 25°C

manufactured by



customized by



## 4A – Heavy duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 1000 C21	115	154	2200	A2A
4R 1000 C31	129	173	2200	A2A
6R 1000 C11	180	241	2200	A2A
6R 1000 C21	195	261	2200	A2A
6R 1000 C31	210	282	2200	A2A
<hr/>				
6R 1100 C11	240	322	1600	A2A
6R 1100 C21	260	349	1600	A2A
6R 1100 C31	280	375	1600	A2A
<hr/>				
6R 1300 C21	320	429	1600	A2A
6R 1300 C31	340	456	1600	A2A
<hr/>				
6R 1500 C21	380	510	1600	A2A
6R 1500 C31	400	536	1600	A2A

Optimization: 45 EU Nonroad St V (2016/1628)  
47 EU Nonroad St V (2016/1628) + EPA Nonroad T4

Cooling variant:

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

Peak torque			Optimization
Nm	lb-ft	rpm	
675	498	1200-1500	45, 47
750	553	1200-1600	45, 47
1000	738	1200-1600	45, 47
1100	811	1200-1600	45, 47
1200	885	1200-1600	45, 47
<hr/>			
1700	1254	1300	45, 47
1800	1328	1300	45, 47
1900	1401	1300	45, 47
<hr/>			
2200	1623	1300	45, 47
2300	1696	1300	45, 47
<hr/>			
2600	1918	1300	45, 47
2700	1991	1300	45, 47

Series 1500 // 1300 // 1100 // 1000

Diesel engines for mechanical drive

1193 – 1865 kW  
(1600 – 2500 BHP)

#### 4A – Heavy duty operation

Series 4000

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
12V 4000 S11R	1193	1600	1900	SCCC
12V 4000 S11	1286	1725	1900	SCCC
16V 4000 S11	1343	1800	1900	SCCC
12V 4000 S21R	1398	1875	1900	SCCC
12V 4000 S23	1425	1910	1800	SCCC
12V 4000 S21	1510	2025	1900	SCCC
16V 4000 S21R	1600	2146	1800	SCCC
16V 4000 S23	1865	2500	1800	SCCC

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

Cooling variant:  
 SCCC: Separate circuit charge air cooling

Peak torque			Optimization
Nm	lb-ft	rpm	
7612/7595	5614/5602	1500	X, 2
6986	5151	1500	X, 2
8546	6400	1350	2
7612	5615	1500	X, 2
Please consult your distributor.			19
8199	6074	1500	X, 2
10188	7514	1500	2
Please consult your distributor.			19

## Diesel engines for mechanical drive

110 – 375 kW  
(147 – 503 BHP)

&gt; Intake air temperature: 25°C

## 4B – Medium duty operation

Series 900

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 904 C61	110	147	2200	A2A
4R 904 C71	129	173	2200	A2A
4R 924 C71	145	194	2200	A2A
4R 924 C52	115	154	2200	A2A
4R 924 C62	129	173	2200	A2A
4R 924 C72	150	201	2200	A2A
6R 906 C51	170	228	2200	A2A
6R 906 C61	190	255	2200	A2A
6R 906 C71	205	275	2200	A2A
6R 926 C61	220	295	2200	A2A
6R 926 C71	240	322	2200	A2A
6R 926 C52	210	281	2200	A2A
6R 926 C62	225	302	2200	A2A
6R 926 C72	240	322	2200	A2A

Series 460

6R 460 C41	315	422	1800	A2A
6R 460 C51	335	449	1800	A2A
6R 460 C61	360	483	1800	A2A
6R 460 C71	375	503	1800	A2A
6R 460 C42	315	422	1800	A2A
6R 460 C52	335	449	1800	A2A
6R 460 C62	360	483	1800	A2A
6R 460 C72	375	503	1800	A2A

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)
	38	EPA Nonroad T4i Comp (40CFR1039)
	39	EU Nonroad St IIIB Comp (97/68/EC)

manufactured by



customized by



Peak torque			Optimization
Nm	lb-ft	rpm	
580	430	1200-1600	20, 23, 31
675	500	1200-1600	20, 23, 31
750	555	1200-1600	20, 23, 31
610	450	1200-1600	38, 39
675	500	1200-1600	38, 39
800	590	1200-1600	38, 39
810	595	1200-1600	20, 23, 31
1000	735	1200-1600	20, 23, 31
1100	810	1200-1600	20, 23, 31
1200	885	1200-1600	20, 23, 31
1300	960	1200-1600	20, 23, 31
1120	825	1200-1600	38, 39
1200	885	1200-1600	38, 39
1300	960	1200-1600	38, 39
2000	1475	1300	20, 23, 31
2000	1475	1300	20, 23, 31
2200	1620	1300	20, 23, 31
2200	1620	1300	20, 23, 31
2000	1475	1300	29, 38, 39
2000	1475	1300	29, 38, 39
2200	1620	1300	29, 38, 39
2200	1620	1300	38, 39

Cooling variant:

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

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



Diesel engines for mechanical drive

354 – 410 kW  
(475 – 550 BHP)

#### 4B – Medium duty operation

Series 60

Engine model	Reference no.	Rated power ICFN		
		kW	bhp	rpm
S60 (14.0 l)	6063HV39	354	475	2100
	6063HV39	373	500	2100
	6063HV39	391	525	2100
	6063HV39	410	550	2100

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

Cooling variant:

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

For additional power ratings please consult your distributor/dealer.

6063HV39 with 391 kW/410 kW: Smoke optimized available upon request

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

Cooling variant	Peak torque			Optimization
	Nm	lb-ft	rpm	
A2A	2102	1550	1350	20, 23, 31
A2A	2102	1550	1350	20, 23, 31
A2A	2373	1750	1350	20, 23, 31
A2A	2373	1750	1350	20, 23, 31

## Diesel engines for mechanical drive

150 – 460 kW  
(201 – 617 BHP)

&gt; Intake air temperature: 25°C

manufactured by



customized by



## 4B – Medium duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 1000 C40	150	201	2200	A2A
4R 1000 C50	170	228	2200	A2A
6R 1000 C40	230	308	2200	A2A
6R 1000 C50	260	349	2200	A2A
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6R 1100 C40	300	402	1700	A2A
6R 1100 C50	320	429	1700	A2A
<hr/>				
6R 1300 C40	360	483	1700	A2A
6R 1300 C50	380	510	1700	A2A
6R 1300 C60	390	523	1700	A2A
<hr/>				
6R 1500 C50	430	577	1700	A2A
6R 1500 C60	460	617	1700	A2A

Series 1500 // 1300 // 1100 // 1000

Peak torque			Optimization
Nm	lb-ft	rpm	
800	590	1200-1600	21, 27, 40
900	664	1200-1600	21, 27, 40
1250	922	1200-1600	21, 27, 40
1400	1033	1200-1600	21, 27, 40
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2000	1475	1300	21, 27, 40
2100	1549	1300	21, 27, 40
<hr/>			
2300	1696	1300	21, 27, 40
2380	1696	1300	21, 27, 40
2460	1807	1300	21, 27, 40
<hr/>			
2750	2028	1300	21, 27, 40
2900	2139	1300	21, 27, 40

Optimization: 21 EPA Nonroad T4 (40CFR1039)  
 27 EU Nonroad St IV (97/68/EC) Compliant  
 40 UN ECE R96 Emission Flex Package (EFP)

Cooling variant:

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

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

## Diesel engines for mechanical drive

150 – 480 kW  
(201 – 644 BHP)

&gt; Intake air temperature: 25°C

manufactured by



customized by



## 4B – Medium duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
4R 1000 C41	150	201	2200	A2A
4R 1000 C51	170	228	2200	A2A
6R 1000 C41	230	308	2200	A2A
6R 1000 C51	260	349	2200	A2A
6R 1000 C61	280	375	2200	A2A
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6R 1100 C41	300	402	1600	A2A
6R 1100 C51	320	429	1600	A2A
6R 1100 C61	340	456	1600	A2A
<hr/>				
6R 1300 C41	360	483	1600	A2A
6R 1300 C61	390	523	1600	A2A
<hr/>				
6R 1500 C51	430	577	1600	A2A
6R 1500 C61	460	617	1600	A2A
6R 1500 C71	480	644	1600	A2A

Optimization: 45 EU Nonroad St V (2016/1628)  
47 EU Nonroad St V (2016/1628) + EPA Nonroad T4

Cooling variant:

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

Peak torque			Optimization
Nm	lb-ft	rpm	
850	627	1200-1600	45, 47
950	701	1200-1600	45, 47
1300	959	1200-1600	45, 47
1450	1069	1200-1600	45, 47
1550	1143	1200-1600	45, 47
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2000	1475	1300	45, 47
2100	1549	1300	45, 47
2200	1623	1300	45, 47
<hr/>			
2400	1770	1300	45, 47
2600	1918	1300	45, 47
<hr/>			
2850	2102	1300	45, 47
3000	2213	1300	45, 47
3100	2286	1300	45, 47

Series 1500 // 1300 // 1100 // 1000

Diesel engines for mechanical drive

783 – 970 kW  
(1050 – 1301 BHP)

#### 4B – Medium duty operation

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
12V 2000 S56	783	1050	1800/ 2100	SCCC
16V 2000 S56	970	1301	2100	SCCC

Optimization: 31 China NRMM Stage III (GB20981-2014)  
38 EPA Nonroad T4i Comp (40CFR1039)

Cooling variant:

SCCC: Separate circuit charge air cooling

Peak torque			Optimization
Nm	lb-ft	rpm	
4640	3423	1100-1500	31, 38
5471	4035	1300	31, 38

Series 2000

## Diesel engines for mechanical drive

447 – 496 kW  
(600 – 665 BHP)

> Intake air temperature: 25°C

## 4C – Short-time duty operation

Series 60

Engine model	Reference no.	Rated power ICFN		
		kW	bhp	rpm
S60 (14.0 l)	6063HV39	447	600	2100
	6063HV39	470	630	2100
	6063HV39	496	665	2300

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

Cooling variant:

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

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

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

6063HV39: Smoke optimized available upon request

Cooling variant	Peak torque			Optimization
	Nm	lb-ft	rpm	
A2A	2576	1900	1350	20, 23, 31
A2A	2576	1900	1350	20, 23, 31
A2A	2576	1900	1350	20, 23, 31

## Diesel engines for mechanical drive

858 – 2461 kW  
(1150 – 3300 BHP)

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

## 4D – Frac operation

Series 2000

Engine model	Rated power ICFN			Cooling variant
	kW	bhp	rpm	
12V 2000 S96	858	1150	2100	SCCC
16V 2000 S96	1163	1560	2100	SCCC
12V 4000 S83	1678	2250	1900	SCCC
12V 4000 T94	1680	2253	1900	SCCC
12V 4000 T95R	1680	2253	1900	SCCC
12V 4000 S83L	1865	2500	1900	SCCC
12V 4000 T95	1865	2500	1900	SCCC
12V 4000 T94L	1865	2500	1900	SCCC
12V 4000 T95L	1939	2600	1900	SCCC
16V 4000 S83	2237	3000	1900	SCCC
16V 4000 T95	2240	3004	1900	SCCC
16V 4000 S83L	2461	3300	1900	SCCC

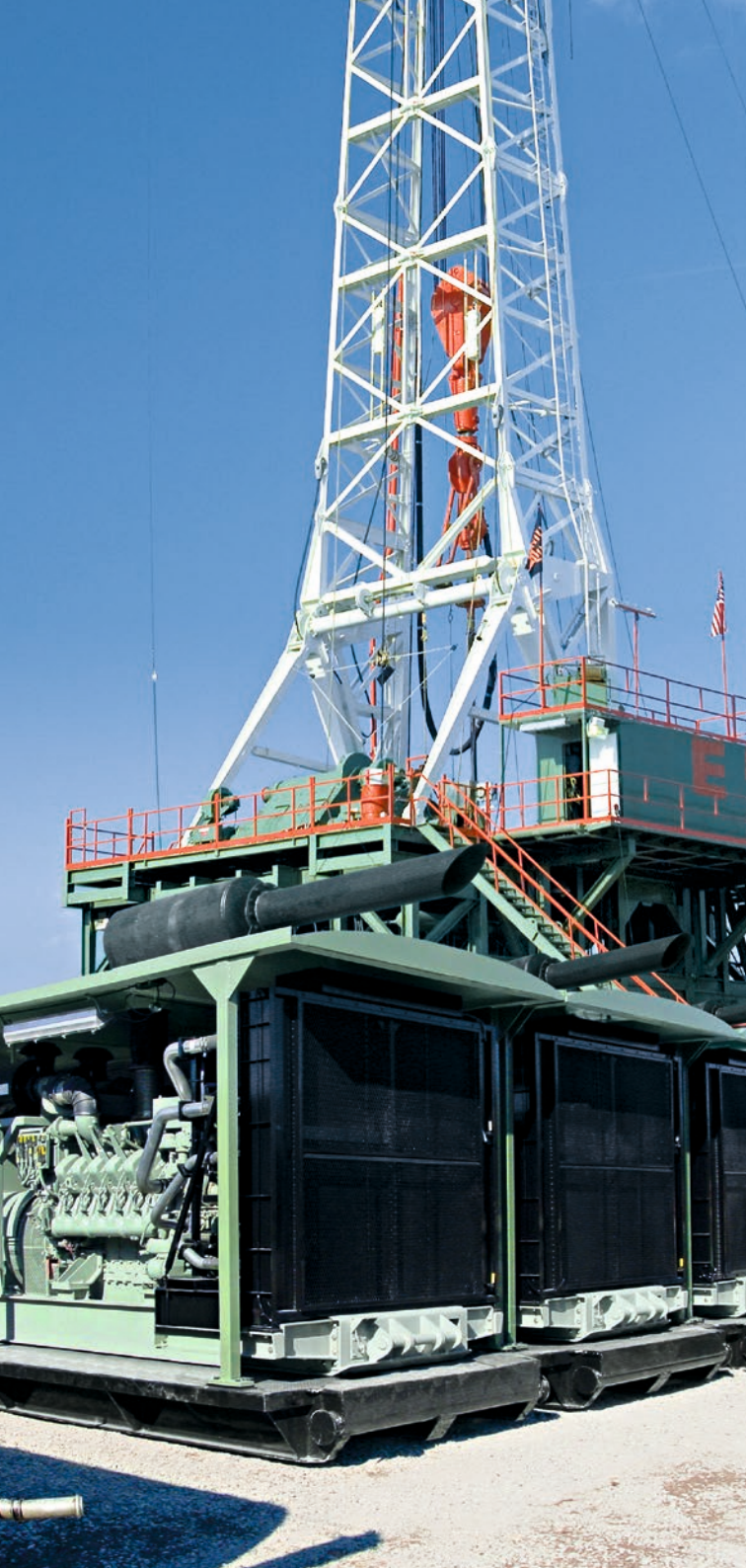
Optimization:	19	EPA Nonroad T2 Comp (40CFR89)
	21	EPA Nonroad T4 (40CFR1039)
	31	China NRMM Stage III (GB20981-2014)
	36	EPA Nonroad T2 Comp
	38	EPA Nonroad T4i Comp (40CFR1039)

Cooling variant:

SCCC: Separate circuit charge air cooling

Peak torque			Optimization
Nm	lb-ft	rpm	
4911	3622	1300-1600	31, 38
6582	4854	1300	31, 38
10000	7376	1540	19, 31
8750	6138	1400	38
9035	on request	1400	21
10460	7715	1560	19, 31
9654	on request	1400	21
9373	6812	1900	38
9145	on request	1900	21
13333	9834	1540	19, 31
11664	on request	1400	21
Please consult your distributor.			31, 36

## SYSTEMS SOLUTIONS



Diesel engine genset for electric drilling application

1105 – 1420 KW  
(1482 – 1904 BHP)

### Electric Drilling Package (EDP)

Series 4000

Engine model	Rated power ICXN 60 Hz - 1200 rpm		Cooling variant	Optimization
	kW	bhp		
12V 4000 G73	1105	1482	A2A	19
12V 4000 G14F	50 Hz - 1500 rpm		A2A	X, 1, 24
	1420	1904		

Optimization: X Fuel consumption optimized  
 1 Emission optimized (TA-Luft)  
 19 EPA Nonroad T2 Comp (40CFR89)  
 24 NEA Singapore for ORDE

Cooling variant:

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

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



Diesel engine system for frac application

1680 – 1939 kW  
(2250 – 2600 BHP)

### FracPack System

Series 4000

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

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

12V engine with ZF 8 TX frac transmission, Weir SPM® QEM 3000 pump, 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 FracPack with 12V 4000 T95 only.

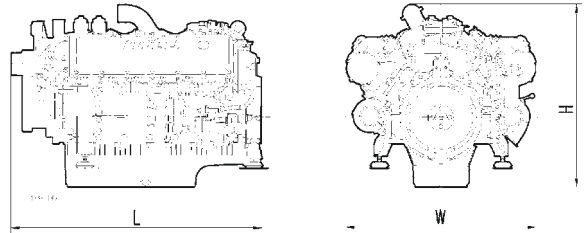
Rated power			Optimization
kW	bhp	rpm	
1680	2250	1900	21
1865	2500	1900	21
1939	2600	1900	21
1865	2500	1900	19

# ENGINE DATA



## Diesel engines for generator drive

## SERIES 1600



## Diesel engines for generator drive

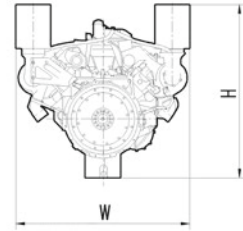
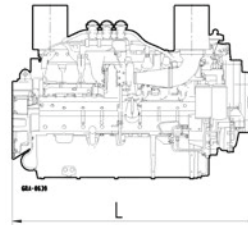
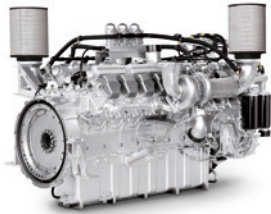
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
10V 1600 Gx0 10 cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	17.5 (1068)
12V 1600 Gx0 12 cyl./90°V	122/150 (4.8/5.9)	1.75 (107)	21.0 (1282)

Dimensions	Mass
L x W x H mm (in)	
1550 x 1258 x 1188 (61 x 50 x 47)	1827 (4028)
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 distributor for current information and binding data.

## Diesel engines for generator drive

## SERIES 2000



## Diesel engines for generator drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 2000 Gx5 12 cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)
12V 2000 Gx5-TB 12 cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	23.9 (1458)
16V 2000 Gx5 16 cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1941)
16V 2000 Gx5-TB 16 cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	31.8 (1941)
18V 2000 Gx5 18 cyl./90°V	130/150 (5.1/5.9)	1.99 (121)	35.8 (2185)

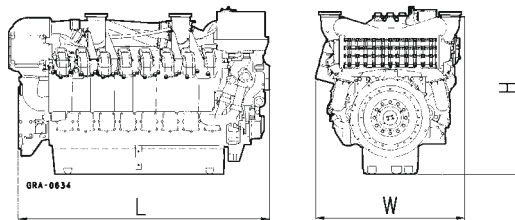
Please note, specifications are subject to change without notice. All dimensions are approximate. Details are subject to options selected. Please contact your distributor for current information and binding data.

Dimensions	Mass
L x W x H mm (in)	
1882 x 1580 x 1580 (74 x 62 x 62)	2490 (5490)
1835 x 1580 x 1580 (72 x 62 x 62)	2570 (5665)
2226 x 1580 x 2015 (88 x 62 x 79)	3150 (6835)
2180 x 1580 x 1580 (86 x 62 x 62)	3180 (7010)
2400 x 1780 x 2015 (95 x 70 x 79)	3500 (7715)

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 4000



Diesel engines for generator drive

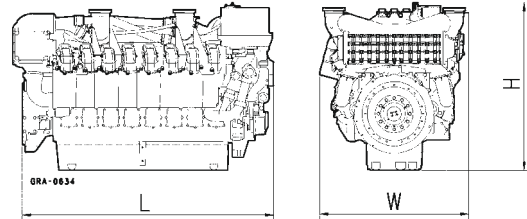
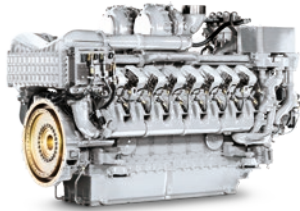
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 Gx4 12 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
16V 4000 Gx4 16 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)
20V 4000 Gx4 20 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	95.4 (5822)

Dimensions	Mass
L x W x H mm (in)	(dry) kg (lbs.)
2495 x 1611 x 2182 (98 x 63 x 86)	6200 (13670)
2981 x 1661 x 2182 (117 x 65 x 86)	7700 (16975)
3486 x 1701 x 2172 (137 x 67 x 86)	9290 (20481)

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

## Diesel engines for generator drive

## SERIES 4000



## Diesel engines for generator drive

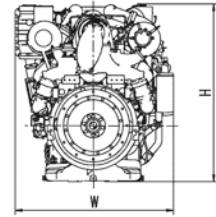
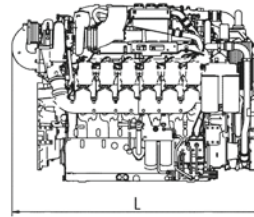
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 Px3 12 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
16V 4000 Px3 16 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)
20V 4000 Px3 20 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	95.4 (5822)

Dimensions	Mass
L x W x H mm (in)	7300 (16093)
2530 x 1590 x 2065 (100 x 63 x 81)	8800 (19400)
3000 x 1590 x 2065 (118 x 63 x 81)	10680 (23545)
3470 x 1590 x 2065 (137 x 63 x 81)	

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

## Diesel engines for mechanical drive

## SERIES 2000



## Diesel engines for mechanical drive

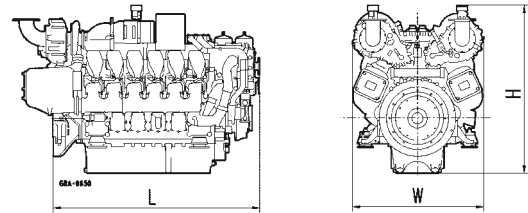
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 2000 Sx6 12 cyl./90°V	135/156 (5.3/6.15)	1.99 (121)	26.8 (1633)
12V 2000 Sx6 12 cyl./90°V	135/156 (5.3/6.15)	2.23 (136)	35.7 (2177)

Dimensions	Mass (dry) kg (lbs.)
2030 x 1280 x 1430 (80 x 50 x 56)	2950 (6503)
2370 x 1280 x 1430 (94 x 50 x 57)	3350 (7385)

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

## Diesel engines for mechanical drive

## SERIES 4000



## Diesel engines for mechanical drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 Sx1 12 cyl./90°V	165/190 (6.5/7.5)	4.06 (248)	48.7 (2972)
16V 4000 Sx1 16 cyl./90°V	165/190 (6.5/7.5)	4.06 (248)	65.0 (3967)
12V 4000 Sx3 12 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
16V 4000 Sx3 16 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)

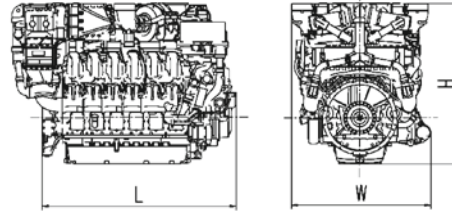
Dimensions	Mass
L x W x H mm (in)	
2409 x 1588 x 1736 (94.8 x 62.5 x 68.3)	6045 (13325)
2879 x 1588 x 1736 (113.4 x 62.5 x 68.3)	7030 (15615)
2405 x 1585 x 1870 (95 x 62 x 74)	6045 (13325)
2975 x 1476 x 1867 (117 x 58 x 74)	7514 (16566)

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



Diesel engines for mechanical drive

## SERIES 4000



Diesel engines for mechanical drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 Tx4 12 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
12V 4000 Tx5 12 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
16V 4000 Tx5 16 cyl./90°V	170/210 (6.7/8.3)	4.77 (291)	76.3 (4655)

Dimensions	Mass
L x W x H mm (in)	
2683 x 1663 x 1943 (105.1 x 65.5 x 75.6)	7685 (16535)
2638 x 1663 x 1943 (104 x 65 x 76)	7820 (17240)
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 distributor for current information and binding data.

## Diesel engines for mechanical drive

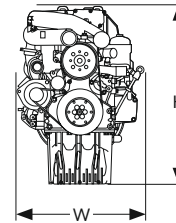
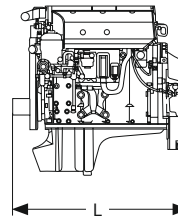
## SERIES 900



manufactured by



customized by



## Diesel engines for mechanical drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
4R 904 Cx1 4 cyl./In-Line	102/130 (4.0/5.1)	1.06 (65)	4.2 (256)
4R 924 Cx1 4 cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	4.8 (293)
4R 924 Cx2 4 cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	4.8 (293)
6R 906 Cx1 4 cyl./In-Line	102/130 (4.0/5.1)	1.06 (65)	6.4 (391)
6R 926 Cx1 4 cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	7.2 (439)
6R 926 Cx2 4 cyl./In-Line	106/136 (4.2/5.4)	1.20 (73)	7.2 (439)

Dimensions	Mass
L x W x H mm (in)	
830 x 672 x 945 (33 x 26 x 37)	395 (870)
830 x 645 x 925 (33 x 25 x 36)	405 (893)
830 x 645 x 925 (33 x 25 x 36)	415 (915)
1087 x 688 x 956 (43 x 27 x 38)	530 (1168)
1087 x 681 x 956 (43 x 27 x 38)	530 (1168)
1087 x 681 x 956 (43 x 27 x 38)	545 (1202)

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

## Diesel engines for mechanical drive

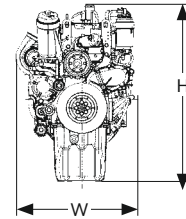
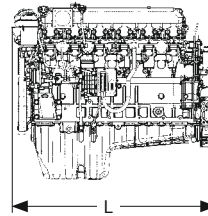
## SERIES 460



manufactured by



customized by



## Diesel engines for mechanical drive

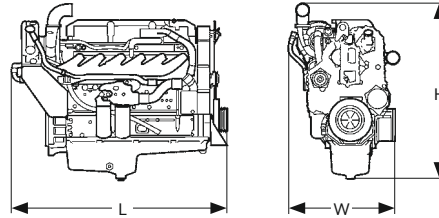
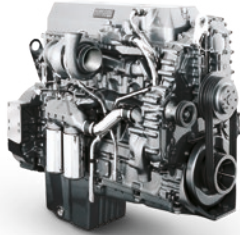
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
6R 460 C11R-C21 6 cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)
6R 460 C31-C71 6 cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)
6R 460 Cx2 6 cyl./In-Line	128/166 (5.0/6.5)	2.13 (129)	12.8 (781)

Dimensions	Mass
L x W x H mm (in)	(dry) kg (lbs.)
1315 x 785 x 114 (52 x 31 x 45)	920 (2028)
1320 x 750 x 1115 (52 x 30 x 44)	920 (2028)
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 distributor for current information and binding data.

## Diesel engines for mechanical drive

## SERIES 60



## Diesel engines for mechanical drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
S60 6 cyl./In-Line	133/168 (5.2/6.6)	2.33 (142)	14.0 (854)

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

Dimensions	Mass	Weight/Power ratio
L x W x H mm (in)	(dry) kg (lbs.)	kg/kW (lbs./bhp)
1455 x 925 x 1380 (57 x 36 x 54)	1215 (2680)	2.4 - 5.4 (4.0 - 8.9)

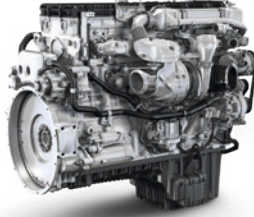
## Diesel engines for mechanical drive

SERIES 1000/  
OM 934/936SERIES 1100/  
OM 470

manufactured by



customized by

SERIES 1300/  
OM 471SERIES 1500/  
OM 473

## Diesel engines for mechanical drive

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
4R 1000 CxO 4 cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	5.1 (311)
6R 1000 CxO 6 cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	7.7 (470)
6R 1100 CxO 6 cyl./In-Line	125/145 (4.9/5.7)	1.77 (108)	10.7 (652)
6R 1300 CxO 6 cyl./In-Line	132/156 (5.2/6.1)	2.13 (130)	12.8 (781)
6R 1500 CxO 6 cyl./In-Line	139/171 (5.5/6.7)	2.60 (159)	15.6 (952)

Dimensions	Mass	Weight/Power ratio
818 x 755 x 1033 (32.2 x 29.7 x 40.7)	540 (1190)	3.2 - 5.4 (5.2 - 8.9)
1059 x 821 x 1033 (41.7 x 32.3 x 40.7)	705 (1555)	2.7 - 3.9 (4.5 - 6.5)
1325 x 955 x 1230 (52.7 x 37.6 x 48.4)	990 (2183)	3.1 - 3.5 (5.1 - 5.8)
1375 x 980 x 1260 (54.1 x 38.6 x 49.6)	1140 (2513)	2.9 - 3.4 (4.8 - 5.5)
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 distributor for current information and binding data.

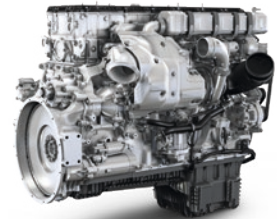
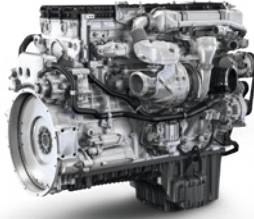
## Diesel engines for mechanical drive

SERIES 1000/  
OM 934/936SERIES 1100/  
OM 470

manufactured by



customized by

SERIES 1300/  
OM 471SERIES 1500/  
OM 473

## Diesel engines for mechanical drive

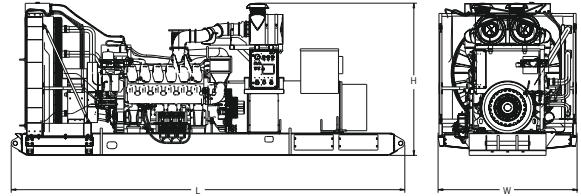
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
4R 1000 Cx1 4 cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	5.1 (311)
6R 1000 Cx1 6 cyl./In-Line	110/135 (4.3/5.3)	1.28 (78)	7.7 (470)
6R 1100 Cx1 6 cyl./In-Line	125/145 (4.9/5.7)	1.77 (108)	10.7 (652)
6R 1300 Cx1 6 cyl./In-Line	132/156 (5.2/6.1)	2.13 (130)	12.8 (781)
6R 1500 Cx1 6 cyl./In-Line	139/171 (5.5/6.7)	2.60 (159)	15.6 (952)

Dimensions	Mass	Weight/Power ratio
948 x 860 x 1033 (37 x 34 x 41)	510 (1124)	3.0 - 4.3 (4.9 - 7.2)
1067 x 929 x 1031 (42 x 37 x 41)	672 (1482)	2.4 - 3.8 (3.9 - 6.2)
1295 x 1029 x 1183 (51 x 41 x 47)	938 (2068)	2.8 - 3.9 (4.5 - 6.4)
1393 x 1043 x 1215 (55 x 41 x 48)	1071 (2361)	2.8 - 3.4 (4.5 - 5.5)
1442 x 1099 x 1237 (57 x 43 x 49)	1230 (2712)	2.6 - 3.2 (4.2 - 5.3)

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

System data – Diesel engine genset for electric drilling application

## ELECTRIC DRILLING PACKAGE



### Diesel engines for mechanical drive

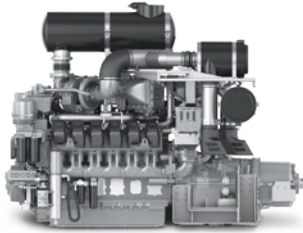
Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 G73 12 cyl./In-Line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
12V 4000 G14F 12 cyl./In-Line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)

Dimensions	Mass
L x W x H mm (in)	16556 (36500)
7160 x 2521 x 2785 (282 x 100 x 110)	15060 (33200)

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

Diesel engine system for frac application

## FRACPACK



### FracPack System

Engine	Cylinder data		
	Bore/Stroke mm (in)	Cyl. displac. l (cu in)	Tot. displac. l (cu in)
12V 4000 T95 12 cyl./In-Line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)
12V 4000 S83 12 cyl./In-Line	170/210 (6.7/8.3)	4.77 (291)	57.2 (3491)

Dimensions	Mass
L x W x H mm (in)	(dry) kg (lbs.)
3812 x 2465 x 2822 (150 x 97 x 111)	on request
3849 x 1597 x 1867 (152 x 63 x 74)	7839 (17281)

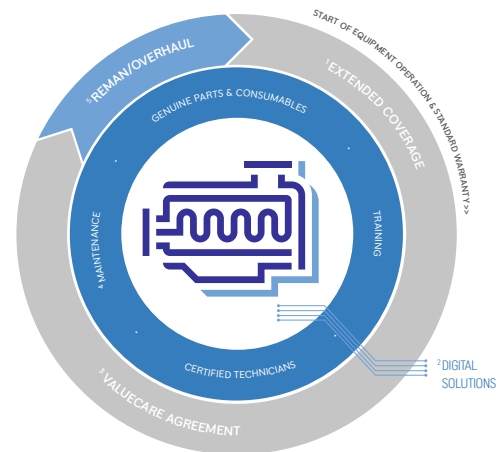
Please note, specifications are subject to change without notice. All dimensions are approximate. Details are subject to options selected.



Complete lifecycle solutions.

## ENSURE A LONG, RELIABLE LIFE.

As your equipment ages, its needs—and yours—change. Our full portfolio of service solutions wrap around your investment, providing 360 degrees of customized support, for optimal value at every stage of life.



- 1 Avoid the unexpected with added protection beyond the standard warranty.
- 2 Make better decisions faster with data-enhanced tools.
- 3 Maximize availability and optimize lifecycle costs with a ValueCare Agreement.
- 4 Improve system performance and extend equipment life with on-demand support.
- 5 Keep a good thing going with factory reman/rebuild solutions.



Complete lifecycle solutions.

## RELY ON OUR EXPERTISE.

To give your equipment a long and productive life, choose a partner you can trust. Only factory-certified technicians know how to get the job done right using proven service methods, factory-specified maintenance schedules and genuine OEM parts.

From preventive maintenance to complete overhaul, we are your true lifecycle partner. Whatever level of support you need, our global network of factory-trained professionals knows all about your equipment and is ready to help you maximize performance and minimize lifecycle costs.

### Never compromise

MTU engines and systems are built to last with legendary high standards. When it's time for service, don't settle for anything less. Protect the life of your equipment with professional certified service technicians and genuine OEM parts and consumables—the only options that live up to our standards for craftsmanship, quality and performance. To get the most from your equipment, there are no shortcuts. For maximum reliability, performance and uptime, choose a name you can trust.

### If you need us a little:

On-Demand Support—including professional inspections and preventive maintenance recommendations from us—we help you to identify and address problems early, save on repairs or unexpected downtime, and optimize your equipment's performance and longevity. Inspections include visual assessment, test run and leak check, on-site oil and coolant analysis, diagnostic evaluation and reporting.

### If you need us a lot:

ValueCare Agreements make it easy to keep your business running smoothly and reduce total cost of ownership by maximizing uptime, optimizing lifecycle costs and helping you avoid equipment-related business disruptions through preventive maintenance.



## ValueCare Agreements

FOCUS ON YOUR OPERATIONS.  
LEAVE THE REST TO US.

## Service solutions designed around your priorities

ValueCare Agreements make it easy to optimize lifecycle costs, maximize uptime and devote more time and resources to your core business, with tailored solutions to move your business forward.

## Gold

## Maximize operational uptime

- Operational uptime commitment to meet or exceed your availability targets
- Regular supervision by local service partner (e.g. monitoring of parts stock,
- 24/7 emergency assistance with on-site support
- Monthly reports, including availability and average repair times
- Asset health monitoring
- Annual performance meetings and trend analysis with us to address technical updates, engine fleet data, operational optimization and more

*Gold also includes all benefits of Silver & Bronze levels*



## Silver

## Eliminate unexpected maintenance costs

- Proactive maintenance planning, troubleshooting and remote engine health monitoring
- Fixed pricing per operating hour for maintenance and repairs
- Key corrective maintenance components always in-stock at our main warehouses
- 24/7 standby service with remote technical support
- Quarterly reports, including reliability analysis (mean time between failure)

*Silver also includes all benefits of Bronze level*








## Bronze

## Ensure parts availability and price stability

- Digital connectivity (Go! Connect) and platform access (Go! Manage)
- Automated delivery of parts (preventive) at a predefined rate based on operating hours
- Preventive maintenance labor options to fit your business needs
- Dedicated support for technical issues
- Quarterly reporting of completed and upcoming maintenance and costs
- Annual on-site engine health check by our technician



## ValueCare Agreements help you:

-  Increase operational uptime
-  Guarantee parts availability and service quality
-  Predict equipment-related costs
-  Optimize maintenance planning
-  Connect to us, 24/7

## Digital Solutions

## THE FUTURE IS DIGITAL.

Fueled by your system's data—and supplemented with our exclusive expertise, smart analytics and extensive database—digital solutions magnify the power of your investment.

From proactive failure prevention and intelligent troubleshooting to instant failure support and smart maintenance planning, digital solutions unlock the full potential of your MTU system.

**Service in your pocket**

Designed to support on-site operators, Go! Act:

- Receives push notification of failure codes from connected assets
- Provides crew members with vital information about failure codes
- Supports event reporting with convenient photo capture functionality
- Enables direct communication with fleet managers or our Customer Assistance Center

**Monitor your fleet**

Built for fleet managers, Go! Manage:

- Provides a live overview of fleet, asset and engine conditions
- Displays active and closed alarms
- Enables interaction and communication with on-site staff via Go! Act
- Shows maintenance schedule, with completed tasks clearly marked
- Supports remote troubleshooting via multigraph

## Remanufactured Products

## EXCHANGE AND SAVE.

Factory remanufactured products deliver the same high standards of performance, service life and quality as new products, along with identical warranty coverage—at a fraction of the cost. And with design and model-related updates, they also feature similar technological advancements. Developed by R&D engineers, the remanufacturing process saves you time and money, while benefiting the environment through the reuse of materials. To help you work efficiently, a wide range of remanufactured parts, engines and systems are available worldwide.

**Reduce lifecycle costs.**

As you evaluate your long-term power needs, you must consider a variety of factors. Factory remanufactured products are a smart solution, helping you reduce the total lifecycle cost of your equipment.

**Save time.**

Factory remanufactured products put your equipment back to work faster than an overhaul, which reduces downtime, service time and indirect costs such as storage.

**Maintain standards.**

All products are remanufactured to our strict standards by our certified technicians at our regional reman centers. Only we can remanufacture our parts, engines or systems to original factory specifications.

**Protect the environment.**

Since remanufacturing is an efficient use of resources and energy, factory remanufactured products benefit the environment as well.



## Service Network

# LOCAL SUPPORT. WORLDWIDE.

The most important part of your power system isn't a part at all—it's your local service team. With more than 1,200 service locations worldwide—backed by regional Parts Logistics Centers in Europe, Asia and America—you can count on responsive support by expert technicians, wherever work takes you. To find your local service partner, visit [www.mtu-solutions.com](http://www.mtu-solutions.com).

### Always on call, 24/7

Whether it's connecting you with a local service partner or assigning an urgent problem to a dedicated team of our experts, we're ready to assist you—wherever you are, whatever you need.

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Asia/Pacific +65 6860 9669

North and Latin America +1 248 560 8888

[info@ps.rolls-royce.com](mailto:info@ps.rolls-royce.com)



## 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.

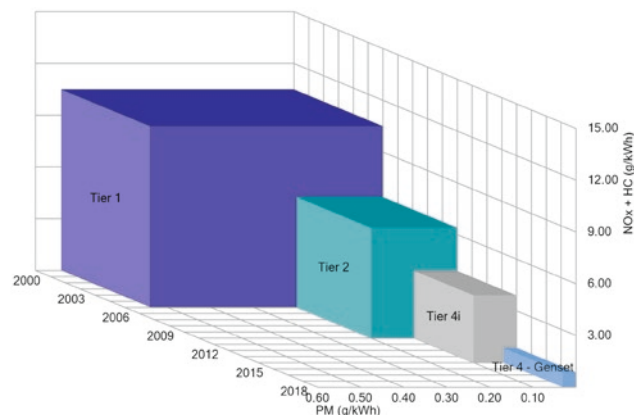
Especially PowerGen applications may be subject to more stringent regional or municipal emission limits (e.g. Non-Attainment Areas).

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

## Samples 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 Industry. For details please consult the applicable legislation and/or permitting authority.

**IMO - International Maritime Organization**

MARPOL Annex VI Regulation 13 (NO<sub>x</sub>) and NO<sub>x</sub> Technical Code 2008: Marine diesel engines > 130 kW for ships engaged on international voyages to which MARPOL Annex VI applies (= flying the flag of a signatory, or entering waters of the jurisdiction of a 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 NO<sub>x</sub> Emission Control Areas (NO<sub>x</sub> ECA)
- IMO Tier III is applicable in NO<sub>x</sub> Emission Control Areas (NO<sub>x</sub> ECA) only

**Emission Control Areas (ECA):**

- An ECA may limit NO<sub>x</sub>, SO<sub>x</sub> and particulate matter (PM) emissions, or both. MARPOL Annex VI Regulation 14 (SO<sub>x</sub> 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 NO<sub>x</sub>.
- Additionally to the North American & US Caribbean, the North Sea and the Baltic Sea are established as ECA for SO<sub>x</sub> 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
- > 1000 kW EPA Tier 4
- > 600 kW EPA Tier 4 from October 1st, 2017
- 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.
- 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 engine/boat into the market. Exemption rules are in place.

**Currently applicable emission stages:**

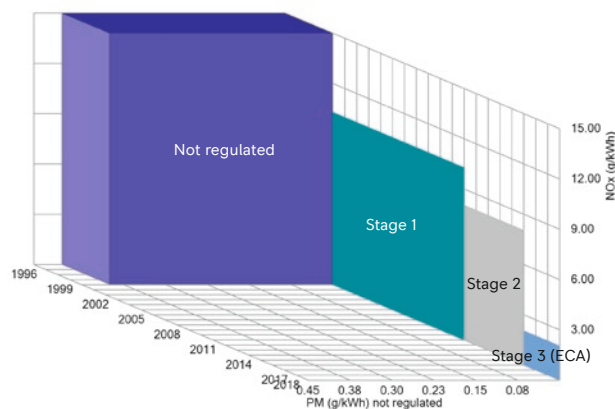
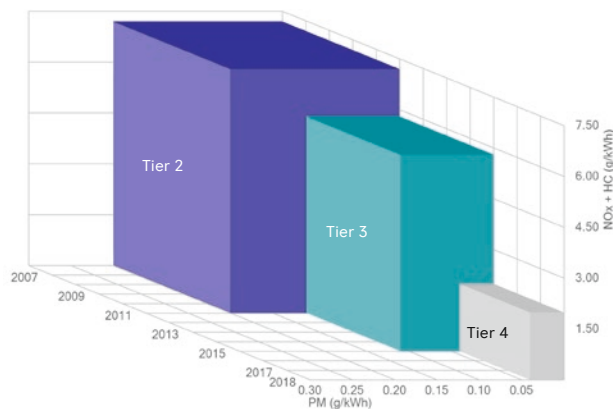
- RCD 2

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

Besides current emission standards we are 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

**EPA**



## Exhaust emissions

## OIL &amp; 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.

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

**Stationary applications/machinery:**

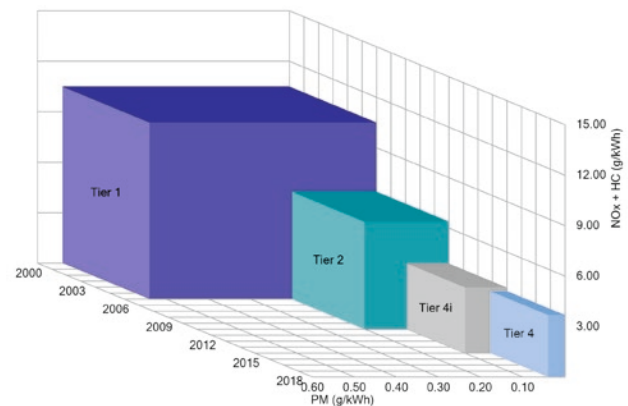
- Stationary emission legislation differentiates between emergency standby and non-emergency applications.
- Usually non-emergency applications have more stringent emission limits.
- Engines for emergency standby applications are often limited by operating hours per year. The operating hour limitation 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 country or region specific emission requirements and have appropriate emission certification(s) which are explicitly stated in respective technical specifications. Any export/import/operation of the engine in countries or regions with different applicable emission law requirements is at the customers responsibility.



