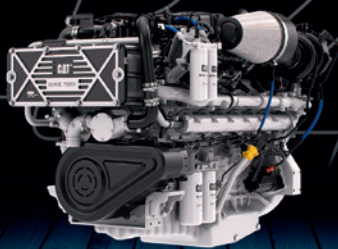


MARINE POWER SOLUTIONS

EDITION 2021 (MAY)



2025 MHP



CATERPILLAR®

Caterpillar follows a policy of continuous product improvement. For this reason, some material and specifications in the Caterpillar Marine Solutions Guide could change without notice.

For more Information about Caterpillar Marine and current products, as well as legacy products, please visit:

www.cat.com/marine

For Cat® Dealers: Please reference TMI Web for the most current information.

CONTENTS

	Page
Marine Power Solutions	5
Engines and Generator Sets	7
Cat [®] High-Speed and Medium-Speed Solutions.....	7
Cat Propulsion Engines.....	8
Cat Generator Sets and Auxiliary Engines.....	40
Cat Controls and Displays	69
Cat Selective Catalytic Reduction (SCR)	75
Cat Services	79
Customer Value Agreements (CVAs)	80
Extended Service Coverage (ESC)	81
Remanufactured Parts (Reman)	82
Cat S•O•S SM Fluid Analysis.....	83
Modernizing Your Fleet	84
Worldwide Dealer Network	85
MaK [™] Medium-Speed and Dual Fuel Solutions	87
MaK Propulsion Engines	89
MaK Generator Sets	111
MaK Controls and Displays.....	133
Selective Catalytic Reduction	135
MaK Parts and Service	137
Customer Value Agreements	140
EMD Medium-Speed and Dual Fuel Solutions.....	141
EMD Propulsion and Dual Fuel Engines.....	142
Glossary	151
Emissions Standards.....	152
Marine Rating Definition Propulsion Engines.....	156
Marine Rating Definition Generator Sets and Auxiliary Engines.....	159
Abbreviations	160
Addresses.....	161



YOUR PARTNER IN SUCCESS

500 LOCATIONS: Dedicated to deliver the best service whenever and wherever you need it

SEAMLESS OWNERSHIP: Caterpillar works with you to create custom service plans for a seamless ownership experience

SERVICE PARTNERSHIP: Caterpillar shares in the risk of maintenance, ensuring we prosper only when you prosper

INVESTING TOGETHER: Caterpillar is driven to understand your needs and determines investments based on your requirements



**CAT[®] CONCIERGE
SERVICE**

**CAT[®] MARINE
DIGITAL SERVICES**

See page 80 for more information.

MARINE POWER SOLUTIONS

Caterpillar Marine, with headquarters in Houston, Texas, groups all the marketing and service activities for Cat® and MaK marine diesel, dual fuel, and gas power systems within Caterpillar Inc.

With over 80 years of experience in the marine industry, the organization provides premier power solutions in the medium and high-speed segments with outputs from 93 to 16,800 kW in main propulsion and 10 to 16,100 kW in marine generator sets. In addition to the power generation, we offer propulsion systems, fuel gas systems, and aftertreatment solutions.

With over 500 dealer locations, Caterpillar is dedicated to being your partner on the water to provide engine and operational success. Customized service offerings through Customer Value Agreements (CVAs), Cat Marine Digital Services, and Cat Concierge, provide customers with a driven team of product experts ready to provide solutions and maintenance needs based on their requirements.

"B" THE FIRST WITH THE MOST

2433 MHP CAT® C32B MARINE ENGINE

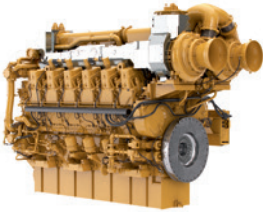


See page 23 for technical data.

Cat High-Speed and Medium-Speed Solutions



Cat Propulsion Engines



Caterpillar Marine offers a complete range of conventional and electronic propulsion solutions spanning across commercial and leisure applications. With power ranging from 209 kW (280 bhp) to 5650 kW (7577 bhp), there are Cat high-speed and medium-speed propulsion solutions for you.



Whatever the application, and whatever the solution, our products are renowned for not only reliability, durability and efficiency, but also for design and manufacturing innovation. They deliver the advanced control that vessel operators need to maximize power and efficiency, and the enhanced monitoring that ensures peace of mind. By leveraging our ACERT™ and Cat Common Rail technologies, our electronic engines are designed to meet all the varying global emission standards.



We're built to keep you working – or having fun – on the water.

C7.1

PROPULSION ENGINE (High Performance Applications)

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
E	406	400	298	2900	21.8	227	T3R	II	RCD	NC
E	456	450	336	2900	24.4	228	T3R	II	RCD	NC
E	507	500	373	2900	27.3	232	T3R	II	RCD	NC

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	4.13 x 5.31 in	105 x 135 mm
Displacement	428 cu in	7.01 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	1676 lb	760 kg

DIMENSIONS

	LE	H	WE
min.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm
max.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm

C7.1

PROPULSION ENGINE (Commercial Applications)

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
B	284	280	209	2300	14.9	226	T3C	II	RCD	NC
C	355	350	261	2500	18.3	222	T3C	II	RCD	NC
D	406	400	298	2600	20.3	223	T3C	II	RCD	NC
D	431	425	317	2700	22.9	226	T3C	II	RCD	NC

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	4.13 x 5.31 in	105 x 135 mm
Displacement	428 cu in	7.01 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	1676 lb	760 kg

DIMENSIONS

	LE	H	WE
min.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm
max.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm

C8.7

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
E	650	641	478	2300	33.0	217	T3R	II	RCD	

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TSA	
Bore x Stroke	4.6 x 5.3 in	117 x 135 mm
Displacement	531 cu in	8.7 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	2400 lb	1089 kg

DIMENSIONS

	LE	H	WE
min.	47.9 in/1218 mm	38.7 in/984 mm	34.7 in/881 mm
max.	47.9 in/1218 mm	38.7 in/984 mm	34.7 in/881 mm

C9.3

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
B	381	375	280	1800	19.3	219.1	T3C	II	RCD	C-II
C	421	416	310	2100	21.5	220.4	T3C	II	RCD	C-II
D	483	476	355	2300	24.9	222.3	T3C	II	RCD	C-II

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	4.53 x 5.87 in	115 x 149 mm
Displacement	568 cu in	9.3 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	2083 - 2474 lb	945 - 1122 kg

DIMENSIONS

	LE	H	WE
min.	57.2 in/1452 mm	43.0 in/1093 mm	38.5 in/978 mm
max.	57.2 in/1452 mm	43.0 in/1093 mm	38.5 in/978 mm

C12

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A	345	340	254	1800	16.6	208.3	NC	II	NC	
B	390	385	287	1800	18.6	205.7	NC	II	NC	
C	460	454	339	2100	22.0	205.9	NC	II	NC	
C	497	490	366	2300	24.0	208.8	NC	I	NC	
D	578	570	425	2300	27.9	208.8	NC	I	NC	
E	609	600	448	2300	29.3	208.1	NC	I	NC	
E	669	660	492	2300	34.1	220.0	NC	II	NC	
E	715	705	526	2300	36.5	220.3	NC	II	NC	

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	5.1 x 5.9 in	130 x 150 mm
Displacement	732 cu in	12 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	2588 lb	1174 kg

DIMENSIONS

	LE	H	WE
min.	62.0 in/1574 mm	39.5 in/1005 mm	38.1 in/969 mm
max.	62.0 in/1574 mm	39.5 in/1005 mm	38.1 in/969 mm

C12.9

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
E	850	838	625	2300	43.3	220.1	T3R	II	RCD	
E	1000	985	735	2300	50.7	218.9	T3R	II	RCD	

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA/TSA	
Bore x Stroke	5.31 x 5.9 in	135 x 150 mm
Displacement	787 cu in	12.9 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	3635 - 3686 lb	1649 - 1672 kg

DIMENSIONS

	LE	H	WE
min.	57.6 in/1463 mm	42.7 in/1085 mm	43.7 in/1110 mm
max.	57.6 in/1463 mm	42.7 in/1085 mm	43.7 in/1110 mm

3406C

Mechanical Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A	370	365	272	1800	17.8	208.0	NC	NC	NC	
B	406	400	298	1800	19.5	208.0	NC	NC	NC	

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	5.4 x 6.5 in	137.2 x 165.1 mm
Displacement	891 cu in	14.6 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	2921 lb	1325 kg

DIMENSIONS

	LE	H	WE
min.	57.3 in/1454.2 mm	50.3 in/1278.5 mm	36.0 in/913.5 mm
max.	57.3 in/1454.2 mm	50.3 in/1278.5 mm	36.0 in/913.5 mm

C18

PROPULSION ENGINE (Commercial Applications)

RATINGS AND FUEL CONSUMPTION

IMO Tier II

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A	460	454	339	1800	22.6	212.1	NC	II	NC	C-I
A	485	479	357	1800	23.7	211.3	NC	II	NC	C-I
A	608	600	447	1800	30.0	213.1	NC	II	NC	C-I
B	560	553	412	2100	28.7	221.3	NC	II	NC	C-I
B	680	670	500	2100	35.2	223.8	NC	II	NC	C-I
C	725	715	533	2100	37.6	223.9	NC	II	NC	C-I
D²	885	873	651	2200	45.0	219.3	NC	II	NC	

U.S. EPA Tier 3 and IMO Tier II

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A	475	469	350	1800	24.5	222.0	T3C	II	RCD	C-I
A	608	600	447	1800	30.7	218.5	T3C	II	RCD	C-I
B¹	680	670	500	1800-2100	34.7	223.6	T3C	II	RCD	C-I
C¹	725	715	533	1800-2100	37.2	221.7	T3C	II	RCD	C-I
D	814	803	599	2100	41.8	221.6	T3C	II	RCD	C-I

¹ Wide Operating Speed Range (WOSR)

Heat Exchanger (32°C Sea Water Temp), Keel Cooled (52°C SCAC Temp)

(continued)

² Sea Water Aftercooled

C18

PROPULSION ENGINE (Commercial Applications)

(continued)

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA, TTA	
Bore x Stroke	5.7 x 7.2 in	145 x 183 mm
Displacement	1106 cu in	18.1 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	4000 - 4299 lb	1814 - 1950 kg

DIMENSIONS

	LE	H	WE
min.	73.0 in/1854 mm	47.2 in/1198 mm	44.6 in/1134 mm
max.	76.0 in/1931 mm	51.2 in/1300 mm	47.4 in/1204 mm

PROPULSION ENGINE (High Performance Applications)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 and IMO Tier II

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
E	1015	1001	747	2300	53.8	228.9	T3R	II	RCD	C-I
E	1150	1136	847	2300	58.6	219.8	T3R	II	RCD	C-I

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA, TTA	
Bore x Stroke	5.7 x 7.2 in	145 x 183 mm
Displacement	1106 cu in	18.1 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	4000 - 4299 lb	1814 - 1950 kg

DIMENSIONS

	LE	H	WE
min.	73.0 in/1854 mm	47.2 in/1198 mm	44.6 in/1134 mm
max.	76.0 in/1931 mm	51.2 in/1300 mm	47.4 in/1204 mm

C32

PROPULSION ENGINE (Commercial Applications)

RATINGS AND FUEL CONSUMPTION

IMO Tier II/IMO Tier III

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A¹	669	660	492	1600-1800	32.3	208.4	NC	II	IW*	C-1
A¹	760	750	559	1600-1800	36.2	205.8	NC	II	IW*	C-1
A¹	760	750	559	1600-1800	37.5	213.2	NC	II/III	NC	
A¹	862	850	634	1600-1800	41.0	205.3	NC	II	IW*	C-1
A	964	950	709	1600	45.2	202.7	NC	II	IW*	C-1
A¹	1014	1000	746	1600-1800	48.1	204.9	NC	II	IW*	C-1
A¹	1014	1000	746	1600-1800	49.8	212.1	NC	II/III	NC	
B¹	1217	1200	895	1800-2000	59.3	210.5	NC	II	IW*	C-1
B¹	1217	1200	895	1800-2000	59.3	210.5	NC	II/III	NC	
B	1319	1300	970	2100	64.1	211.2	NC	II	IW*	C-1
B	1319	1300	970	2100	64.6	211.4	NC	II/III	NC	
C	1319	1300	970	1800	62.5	204.6	NC	II	IW*	
C⁴	1319	1300	970	1800	62.5	204.5	NC	II/III	NC	
C¹	1470	1450	1081	2000-2300	77.2	226.8	NC	II	IW*	C-1
C¹	1470	1450	1081	2000-2300	76.8	225.6	NC	II/III	NC	
D^{1,2}	1622	1600	1193	2000-2300	82.0	218.2	NC	II	IW*	C-1

¹ Wide Operating Speed Range (WOSR)

Heat Exchanger (32°C Sea Water Temp), Keel Cooled (52°C SCAC Temp)

² Sea Water Aftercooled

⁴ Contact your local dealer for availability on U.S. EPA Tier 4 Final and IMO III ratings.

* EU Stage IIIA certification > 300 bkW will not be available after December 2019. Contact your local dealer for availability.

(continued)

C32

PROPULSION ENGINE (Commercial Applications)

(continued)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 and IMO Tier II

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A¹	760	750	559	1600-1800	37.5	213.2	T3C	II	IW*	
A¹	811	800	597	1600-1800	40.3	214.6	T3C	II	IW*	C-1

* EU Stage IIIA certification > 300 bkW will not be available after December 2019. Contact your local dealer for availability.

U.S. EPA Tier 4 Final and IMO Tier III

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
A¹	1014	1000	746	1600-1800	49.6	210.9	T4C	III	IW*	
B¹	1217	1200	895	1800-2100	59.1	209.8	T4C	III	IW*	
C¹	1319	1300	970	1800-2100	64.3	210.7	T4C	III	IW*	
C¹	1470	1450	1081	2050-2150	73.4	215.6	T4C	III	IW*	

¹ Wide Operating Speed Range (WOSR)

Heat Exchanger (32°C Sea Water Temp), Keel Cooled (52°C SCAC Temp)

² Sea Water Aftercooled

⁴ Contact your local dealer for availability on U.S. EPA Tier 4 Final and IMO III ratings.

* EU Stage IIIA certification > 300 bkW will not be available after December 2019. Contact your local dealer for availability.

(continued)

C32

PROPULSION ENGINE (Commercial Applications)

(continued)

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	5.71 x 6.38 in	145 x 162 mm
Displacement	1659 cu in	32.1 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	6950 - 7160 lb	3152 - 3248 kg

DIMENSIONS

	LE	H	WE
min.	83.5 in/2121 mm	60.9 in/1547 mm	60.17 in/1528 mm
max.	89.9 in/2284 mm	62.5 in/1587 mm	60.17 in/1528 mm

C32

PROPULSION ENGINE (High Performance Applications)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 and IMO Tier II/III

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
D	1622	1600	1193	2300	86.3	229.7	T3R	II	RCD	C-I
D	1622	1600	1193	2300	86.3	229.7	NC	II/III	NC	
E	1724	1700	1268	2300	91.2	228.4	T3R	II	RCD	C-I
E	1825	1800	1342	2300	95.4	225.7	T3R	II	RCD	C-I
E	1925	1900	1418	2300	100.9	226.1	T3R	II	RCD	C-I

* EU Stage IIIA certification > 300 bkW will not be available after December 2019.
Contact your local dealer for availability. RCD will continue to be available.

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	5.71 x 6.38 in	145 x 162 mm
Displacement	1959 cu in	32.1 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	6780 lb	3075 kg

DIMENSIONS

	LE	H	WE
min.	82.9 in/2106 mm	56.9 in/1445 mm	58.3 in/1482 mm
max.	82.9 in/2106 mm	56.9 in/1445 mm	58.3 in/1482 mm

C32B

ADEM VI (A6 ECM)

PROPULSION ENGINE (High Performance Applications)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 and IMO Tier II/III

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
E	2025	2000	1491	2300	160.0	227.0	T3	II	NC	

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke		145 x 162 mm
Displacement		32.1 liter
Rotation (from flywheel end)	CCW	
Engine dry weight (approx)	lb	3145 kg

DIMENSIONS

	LE	H	WE
min.	82.9 in/2106 mm	56.9 in/1445 mm	in/1469 mm
max.			

3512C

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
A	1298	1280	954	1600	61.3	204.0	NC	II	C-I
A	1318	1300	969	1200	64.3	210.6	NC	II	C-I
A	1420	1400	1044	1600	66.6	202.5	NC	II	C-I
A	1520	1500	1119	1800	70.3	200.1	NC	II	C-I
A¹	1521	1500	1118	1200	71.5	203.0	NC	II	C-I
A¹	1699	1675	1249	1600	79.7	202.6	NC	II	C-I
A¹	1836	1810	1350	1600	84.7	207.1	NC	II	C-I
B	1378	1360	1014	1600	64.8	203.0	NC	II	C-I
B	1420	1400	1044	1200	69.1	210.1	NC	II	C-I
B	1521	1500	1119	1600	71.1	201.9	NC	II	C-I
B	1597	1575	1174	1800	73.8	199.9	NC	II	C-I
B¹	1622	1600	1193	1200	76.2	202.8	NC	II	C-I
B¹	1774	1749	1305	1600	82.5	200.7	NC	II	C-I
B¹	1938	1911	1425	1600	89.0	208.5	NC	II	C-I
B¹	2282	2250	1678	1800	111.0	209.9	NC	II	NC
C	1429	1410	1051	1600	67.0	202.4	NC	II	C-I
C	1521	1500	1118	1200	74.1	210.3	NC	II	C-I
C	1622	1600	1193	1600	70.4	201.7	NC	II	C-I
C	1673	1650	1230	1800	77.2	199.6	NC	II	C-I
C¹	1723	1700	1267	1200	83.4	204.0	NC	II	C-I
C¹	1876	1850	1379	1600	86.4	199.0	NC	II	C-I
C¹	2040	2012	1500	1600	93.7	208.8	NC	II	C-I
C¹	2400	2365	1765	1800	116.5	214.5	NC	II	C-I
D¹	2587	2551	1903	1800	124.4	207.7	NC	II	C-I

¹ High displacement engine (HD)

(continued)

3512C

Electronic Control System

PROPULSION ENGINE

(continued)

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	6.69 x 7.48 in	170 x 190 mm
Bore x Stroke¹	6.69 x 8.46 in	170 x 215 mm
Displacement	3161 cu in	51.8 liter
Displacement¹	3574 cu in	58.6 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	14,400 - 16,340 lb	6532 - 7411 kg

¹ High displacement engine (HD)

DIMENSIONS

	LE	H	WE
min.	102.0 in/2590 mm	75.0 in/1904 mm	80.2 in/2037 mm
max.	105.1 in/2669 mm	88.3 in/2242 mm	87.9 in/2232 mm

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 4 Final and IMO Tier II/III Ratings

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
A	1360	1341	1000	1600	63.0	200.2	T4C	III	NC
A	1523	1502	1120	1600	70.0	198.4	T4C	III	NC
A	1523	1502	1120	1800	73.4	208.0	T4C	III	NC
A	1724	1700	1268	1600	78.8	197.5	T4C	III	NC
A	1835	1810	1350	1600	84.0	197.7	T4C	III	NC
A	2028	2000	1491	1600	93.1	198.2	T4C	III	NC
A	2282	2250	1678	1800	105.7	199.9	T4C	III	NC
B	1598	1576	1175	1800	76.4	206.4	T4C	III	NC
B	2142	2112	1575	1600	98.5	198.6	T4C	III	NC
B	2408	2375	1771	1800	111.3	199.6	T4C	III	NC
C	1673	1650	1230	1800	79.6	205.4	T4C	III	NC
C	2244	2213	1650	1600	103.4	199.0	T4C	III	NC
C	2585	2549	1901	1800	119.7	199.9	T4C	III	NC

All high displacement engines (HD).

Contact dealer for availability.

All ratings can be configured as an IMO II engine without aftertreatment.

(continued)

3512E

Electronic Control System

PROPULSION ENGINE

(continued)

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	6.69 x 8.46 in	170 x 215 mm
Displacement	3574 cu in	58.6 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	16,508 lb	7488 kg

DIMENSIONS

	LE	H	WE
min.	104.2 in/2624 mm	87.5 in/2222.6 mm	80.2 in/2037 mm
max.	104.2 in/2624 mm	87.5 in/2222.6 mm	80.2 in/2037 mm

3516C

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
A	2028	2000	1491	1600	96.3	202.8	NC	II	IW*
A'	2292	2260	1685	1600	107.5	202.4	NC	II	IW*
A'	2482	2448	1825	1600	113.2	206.9	NC	II	IW*
B	2130	2100	1566	1600	100.4	201.8	NC	II	IW*
B'	2407	2375	1771	1600	112.0	200.8	NC	II	IW*
B'	2611	2575	1920	1600	118.6	206.7	NC	II	IW*
B'	3046	3005	2240	1800	148.3	210.3	NC	II	IW*
C	2231	2200	1640	1600	104.5	201.9	NC	II	IW*
C'	2534	2500	1864	1600	117.0	199.3	NC	II	IW*
C'	2720	2682	2000	1600	123.4	198.5	NC	II	IW*
C'	3196	3150	2350	1800	154.7	200.9	NC	II	IW*
D'	2855	2816	2100	1600	114.9	199.0	NC	II	IW*
D'	3434	3385	2525	1800	165.0	207.6	NC	II	IW*

¹ High displacement engine (HD)

(continued)

3516C

Electronic Control System

PROPULSION ENGINE

(continued)

SPECIFICATIONS

Vee 16, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	6.69 x 7.48 in	170 x 190 mm
Bore x Stroke¹	6.69 x 8.46 in	170 x 215 mm
Displacement	4211 cu in	69 liter
Displacement¹	4765 cu in	78 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	17,550 - 19,025 lb	7964 - 8629 kg

¹ High displacement engine (HD)

DIMENSIONS

	LE	H	WE
min.	143.1 in/3637 mm	77.4 in/1967 mm	80.2 in/2037 mm
max.	148.0 in/3761 mm	84.6 in/2150 mm	84.3 in/2142 mm

3516E

PROPULSION ENGINE

Electronic Control System

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 4 Final and IMO Tier II/III Ratings

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
A	2536	2501	1865	1600	118.4	201.5	T4C	III	NC
A	2720	2682	2000	1600	126.7	201.2	T4C	III	NC
A	3046	3004	2240	1800	145.4	206.1	T4C	III	NC
B	2855	2816	2100	1600	133.2	201.4	T4C	III	NC
B	3195	3151	2350	1800	151.2	204.3	T4C	III	NC
C	2991	2950	2200	1600	139.9	202.0	T4C	III	NC
C*	3433	3386	2525	1800	162.2	203.4	T4C	III	NC
D	3549	3500	2610	1800	167.2	206.2	T4C	III	NC

All ratings are high displacement.

All ratings, except 2610 bkW, can be configured as an IMO II engine without aftertreatment.

* D-rated duty cycle engine when configured with IMO II capability.

SPECIFICATIONS

Vee 16, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	6.69 x 8.46 in	170 x 215 mm
Displacement	4765 cu in	78 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	21,164 lb	9600 kg

DIMENSIONS

	LE	H	WE
min.	125.7 in/3192 mm	87.6 in/2225 mm	89.9 in/2284 mm
max.	125.7 in/3192 mm	87.6 in/2225 mm	89.9 in/2284 mm

C175-16

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

IMO Tier II

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
A	2721	2683	2001	1600	132.7	210.6	NC	II	NC
A	2831	2792	2082	1600	138.3	210.9	NC	II	NC
A	3044	3003	2239	1800	143.9	204.1	NC	II	NC
A	3301	3256	2428	1800	156.2	204.3	NC	II	NC
B	2948	2907	2168	1600	144.4	211.5	NC	II	NC
B	3467	3420	2550	1800	167.9	209.1	NC	II	NC

SPECIFICATIONS

Vee 16, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	6.88 x 8.66 in	175 x 220 mm
Displacement	5166.88 cu in	84.67 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	28,750 lb	13,041 kg

DIMENSIONS

	LE	H	WE
min.	177.8 in/4515 mm	97.6 in/2478 mm	72.6 in/1845 mm
max.	177.8 in/4515 mm	97.6 in/2478 mm	72.6 in/1845 mm

C280-6

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
CS	2352	2320	1730	900	105	194.7	NC	II	NC
CS	2515	2481	1850	1000	112	202.7	NC	II	NC
MC	2583	2548	1900	900	108	194.0	NC	II	NC
MC	2760	2722	2030	1000	116	200.4	NC	II	NC

C280 fuel rate is at full load on the prop curve, BSFC is at full power condition.

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	6773 cu in	111 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	34,496 lb	15,680 kg

DIMENSIONS

	LE	H	WE
min.	158 in/4013 mm	108 in/2743 mm	71 in/1803 mm
max.	158 in/4013 mm	108 in/2743 mm	71 in/1803 mm

C280-8

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
CS	3127	3084	2300	900	139	187.9	NC	II	NC
CS	3345	3299	2460	1000	139	197.0	T4C	III	NC
MC	3440	3393	2530	900	143	188.4	NC	II	NC
MC	3684	3634	2710	1000	144	197.8	T4C	III	NC

C280 fuel rate is at full load on the prop curve, BSFC is at full power condition.

SPECIFICATIONS

In-line 8, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	9031 cu in	148 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	41,800 lb	19,000 kg

DIMENSIONS

	LE	H	WE
min.	195 in/4953 mm	104 in/2642 mm	71 in/1803 mm
max.	195 in/4953 mm	104 in/2642 mm	71 in/1803 mm

C280-12

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
CS	4704	4640	3460	900	208	193.8	NC	II	NC
CS	5031	4962	3700	1000	210	199.2	T4C	III	NC
MC	5167	5096	3800	900	214	194.0	NC	II	NC
MC	5520	5444	4060	1000	217	198.8	T4C	III	NC

C280 fuel rate is at full load on the prop curve, BSFC is at full power condition.

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	13,546 cu in	222 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	57,276 lb	25,980 kg

DIMENSIONS

	LE	H	WE
min.	182 in/4623 mm	134 in/3404 mm	80 in/2032 mm
max.	182 in/4623 mm	134 in/3404 mm	80 in/2032 mm

C280-16

Electronic Control System

PROPULSION ENGINE

RATINGS AND FUEL CONSUMPTION

	mhp	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
CS	6255	6169	4600	900	272	187.9	NC	II	NC
CS	6690	6598	4920	1000	293	197.0	NC	II	NC
MC	6879	6785	5060	900	278	188.4	NC	II	NC
MC	7369	7268	5420	1000	302	197.0	NC	II	NC
FCVR	7682	7577	5650	1000	372	205.3	NC	II	NC
FCVR	8158	8046	6000	1000	370	198.5	NC	II	NC

C280 fuel rate is at full load on the prop curve, BSFC is at full power condition.

Arrangements are available with front mounted turbochargers or rear mounted turbochargers.

FMT requires remote mounted (Shipped Loose) heat exchanger for the Oil Cooler.

FMT duplex Oil filters are ship loose and require remote mounting and plumbing.

Single circuit cooling system is not available with FMT configuration.

SPECIFICATIONS

Vee 16, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	18,062 cu in	296 liter
Rotation (from flywheel end)	Counterclockwise or clockwise	
Engine dry weight (approx)	68,343 lb	31,000 kg

DIMENSIONS

	LE	H	WE
min.	224 in/5690 mm	134 in/3404 mm	80 in/2032 mm
max.	224 in/5690 mm	134 in/3404 mm	80 in/2032 mm

DEP

DIESEL ELECTRIC PROPULSION - 50 HZ

RATINGS AND FUEL CONSUMPTION

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
C4.4	95.3	71.1	1500	5.3	264.0	T3C	II	EUV	NC
C4.4	116.4	86.8	1500	6.2	227.5	NC	II	EUV	NC
C4.4	145.6	108.6	1500	7.4	217.9	NC	II	EUV	NC
C7.1	146.5	109.3	1500	7.9	229.6	NC	II/III	EUV ¹	NC
C7.1	172.9	129	1500	9.2	227.5	NC	II/III	EUV ¹	NC
C7.1	219.8	164	1500	11.2	216.5	NC	II/III	NC	NC
C9.3	292	218	1500	13.9	202.6	NC	II	NC	C-II
C9.3	282	210	1500	13.8	208.6	NC	II/III	NC	
C9.3	362	270	1500	17.2	202.6	NC	II	NC	C-II
C9.3	351	262	1500	17.4	211	NC	II/III	NC	
C18	404	301	1500	19.9	210.1	NC	II	NC	
C18	514	383	1500	25.2	209.1	NC	II	NC	C-I
C18²	514	383	1500	24.9	206.6	NC	II/III	NC	
C18	587	438	1500	28.7	208.2	NC	II	NC	C-I
C18	587	438	1500	28.2	204.8	NC	II/III	NC	
C18	660	492	1500	32.3	208.6	NC	II	NC	C-I
C18	660	492	1500	32.2	207.7	NC	II/III	NC	
C32	791	590	1500	37.9	203.8	NC	II	IW	C-I
C32	923	688	1500	44.0	203.0	NC	II	IW	C-I
C32	1172	874	1500	57.0 55.6	207.0 202.0	NC	II III	IW	
3512B	1686	1257	1500	77.4	195.7	NC	II	NC	
3512C	1826	1362	1500	84.7	197.5	NC	II	NC	

¹ Contact your local dealer for availability of C7.1 EU Stage V Inland Waterways Certification.

² Only available via DTO. Fuel sulfur restrictions apply.

(continued)

DEP

DIESEL ELECTRIC PROPULSION - 50 HZ

(continued)

RATINGS AND FUEL CONSUMPTION

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
3512E³	1694	1263	1500	77	194	NC	II/III	NC
3516C	2303	1717	1500	110.3	203.9	NC	II	C-I
3516C	2600	1940	1500	122.6	200.8	NC	II	C-I
3516E³	2301	1716	1500	106	197.5	NC	II/III	NC
3516E³	2598	1937	1500	120	197	NC	II/III	NC
C175-16	3243	2418	1500	153.7	201.9	NC	II	NC
C280-6	2481	1850	1000	118.9	204.3	NC	II	NC
C280-6	2722	2030	1000	131.7	206.2	NC	II	NC
C280-8	3299	2460	1000	153.2	197.9	NC	II	NC
C280-8	3634	2710	1000	170.3	199.7	NC	II	NC
C280-12	4962	3700	1000	237.7	204.2	NC	II	NC
C280-12	5445	4060	1000	263.4	206.2	NC	II	NC
C280-16	6598	4920	1000	306.4	197.9	NC	II	NC
C280-16	7268	5420	1000	340.6	194.7	NC	II	NC

C280 fuel rate at rated power, BSFC is at full power condition.

For C175-16 50Hz DEP, configure using Petro price list and request Marine DEP through DTO process and provide load profile on SRR form.

³ High displacement engine (HD)

DEP

DIESEL ELECTRIC PROPULSION - 60 HZ

RATINGS AND FUEL CONSUMPTION

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
C4.4	95.3	71.1	1800	5.5	247.0	T3C	II	EUV	NC
C4.4	109.2	81.5	1800	5.9	231.3	NC	II	EUV	NC
C4.4	145.6	108.6	1800	7.5	220.3	NC	II	EUV	NC
C4.4	172.9	129	1800	8.3	204.5	NC	II	EUV	NC
C7.1	172.9	129	1800	9.5	233.6	NC	II/III	EUV ²	NC
C7.1	219.7	163.9	1800	11.3	219.4	NC	II/III	NC	NC
C7.1	256.4	191.3	1800	13.2	219.5	NC	II/III	NC	NC
C7.1	293.0	218.6	1800	14.9	216.4	NC	II/III	NC	NC
C9.3	369	275	1800	18.6	215.1	T3C	II	NC	C-II
C9.3	363	271	1800	18.5	216.8	NC	II/III	NC	
C9.3	436	325	1800	21.8	212.8	T3C	II	NC	C-II
C18	499	372	1800	25.4	217.0	NC	II	NC	C-I
C18	624	465	1800	32.8	224.0	T3C	II	NC	C-I
C18	803	599	1800	40.9	217.0	T3C	II	NC	C-I
C18	803	599	1800	41.2	218.3	T3C	II/III	NC	
C32	916	683	1800	45.3	210.8	NC	II	CC2	C-I
C32	1047	781	1800	57.8	210.4	NC	II	NC	C-I
C32	1333	994	1800	64.9	207.2	NC	II	IW	C-I
C32	1333	994	1800	64.0	204.4	T4C	II	IW	
3512C	1920	1431	1800	91.9	204.0	NC	II	IW	C-I
3512C	2183	1628	1800	110.2	215.1	NC	II	IW	C-I
3512C	2400	1790	1800	119.7	212.4	NC	II	IW	C-I
3512E¹	2188	1632	1800	104.0	202.4	T4C	II/III	NC	
3512E¹	2400	1789	1800	113.2	200.9	T4C	II/III	NC	

¹ High displacement engine (HD)

(continued)

² Contact your local dealer for availability of C7.1 EU Stage V Inland Waterways Certification.

DEP

DIESEL ELECTRIC PROPULSION - 60 HZ

(continued)

RATINGS AND FUEL CONSUMPTION

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
3516C	2575	1920	1800	120.6	202.0	NC	II	C-I	
3516C	2809	2095	1800	132.0	200.2	NC	II	C-I	
3516C	2984	2225	1800	140.6	200.1	NC	II	C-I	
3516C	3151	2350	1800	148.9	201.4	NC	II	C-I	
3516E¹	2576	1921	1800	122.7	202.9	T4C	II/III	NC	
3516E¹	2823	2105	1800	135.1	203.7	T4C	II/III	NC	
3516E¹	3175	2368	1800	152.4	204.3	T4C	II/III	NC	
C280-6	2320	1730	900	107.4	197.3	NC	II	NC	
C280-6	2548	1900	900	118.6	198.4	NC	II	NC	
C280-8	3084	2300	900	142.7	193.0	T4C	III	NC	
C280-8	3393	2530	900	153.8	190.7	T4C	III	NC	
C280-12	4640	3460	900	217.4	198.0	T4C	III	NC	
C280-12	5096	3800	900	237.0	196.3	T4C	III	NC	
C280-16	6169	4600	900	278.5	192.7	T4C	III	NC	
C280-16	6786	5060	900	307.0	190.7	T4C	III	NC	

¹ High displacement engine (HD)

C280 fuel rate at rated power, BSFC is at full power condition.

Cat Generator Sets and Auxiliary Engines



With more than 80 years of marine power experience, we offer a wide array of generator sets spanning from 10 ekW (10 kVA) to 5200 ekW (6500 kVA). Cat marine generator sets and auxiliary engines combine proven design and manufacturing methods with the latest technology, such as advanced control for more power and efficiency, and enhanced monitoring that keeps you ahead of any issues that could potentially affect your uptime and productivity.

We're built to provide the power you work with and live by.

C1.5

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

Three Phase ekW@.8pf	Single Phase ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
12.0		15.0	60	1800	1.2	268.2	T3C	NST	NST	NC
10.0		12.5	50	1500	1.0	264.1	T3C	NST	NST	NC
	12.0	12.0	60	1800	1.2	290.5	T3C	NST	NST	NC
	10.0	10.0	50	1500	1.0	290.5	T3C	NST	NST	NC

SPECIFICATIONS

In-line 3, 4-Stroke-Cycle Diesel		
Aspiration	NA	
Bore x Stroke	3.31 x 3.5 in	84 x 90 mm
Displacement	91 cu in	1.5 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	703/908 lb	319/412 kg

DIMENSIONS

	LE	H	WE
Open	40.8 in/1038 mm	27.1 in/689 mm	21.1 in/535 mm
Enclosed	43.1 in/1095 mm	27.9 in/711 mm	24 in/608 mm

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

Three Phase ekW@.8pf	Single Phase ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
18.0		22.5	60	1800	1.63	242.9	T3C	NST	NC	NC
25.0		31.25	60	1800	2.24	241.0	T3C	NST	NC	NC
15.0		18.75	50	1500	1.37	248.8	T3C	NST	NC	NC
20.0		25.0	50	1500	1.88	242.8	T3C	NST	NC	NC
	18.0	18.0	60	1800	1.63	242.9	T3C	NST	NC	NC
	25.0	25.0	60	1800	2.24	241.0	T3C	NST	NC	NC
	15.0	15.0	50	1500	1.37	248.8	T3C	NST	NC	NC
	20.0	20.0	50	1500	1.88	242.8	T3C	NST	NC	NC

SPECIFICATIONS

In-line 4, 4-Stroke-Cycle Diesel		
Aspiration	NA, T	
Bore x Stroke	3.31 x 3.94 in	84 x 100 mm
Displacement	135 cu in	2.2 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	857/1027 lb	389/466 kg

DIMENSIONS

	LE	H	WE
Open	47.9 in/1219 mm	32.8 in/835 mm	22.3 in/567 mm
Enclosed	50.7 in/1290 mm	31.0 in/775 mm	24.7 in/628 mm

C4.4

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
38.0		47.5	50	1500	2.9	221.7	NC	NST	NC	NC
51.5		64.5	50	1500	3.9	220.0	NC	NST	NC	NC
69.0		86.0	50	1500	4.9	206.3	NC	NST	NC	NC
86.0		107.0	50	1500	6.5	219.6	NC	NST	NC	NC
44.0		55.0	60	1800	3.4	224.5	NC	NST	NC	NC
58.5		73.0	60	1800	4.2	208.6	NC	NST	NC	NC
76.0		95.0	60	1800	5.8	221.7	NC	NST	NC	NC
99.0		123.0	60	1800	7.3	214.2	NC	NST	NC	NC
36.0R		45.0	50	1500	2.9	234.0	NC	NST	NC	NC
49.0R		61.0	50	1500	3.9	231.2	NC	NST	NC	NC
65.0R		81.0	50	1500	4.9	219.0	NC	NST	NC	NC
82.0R		103.0	50	1500	6.5	230.3	NC	NST	NC	NC
42.0R		53.0	60	1800	3.4	235.2	NC	NST	NC	NC
56.0R		70.0	60	1800	4.5	233.5	NC	NST	NC	NC
72.0R		90.0	60	1800	5.8	234.0	NC	NST	NC	NC
95.0R		119.0	60	1800	7.3	223.3	NC	NST	NC	NC

R - Radiator cooled only.

ABS, BV, DNV, GL, LR, RINA, CCS approved generator set packages available for ratings.

(continued)

C4.4

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 & IMO Tier II

ekW@.8pf	ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
65		81	50	1500	5.3	264	T3C	NST	EUV	NC
80		100	50	1500	5.7	230	T3C	NST	EUV	NC
99		124	50	1500	6.8	221	T3C	NST	EUV	NC
65		81	60	1800	5.5	247	T3C	NST	EUV	NC
75		94	60	1800	5.3	227	T3C	NST	EUV	NC
99		124	60	1800	6.7	219	T3C	NST	EUV	NC
118		148	60	1800	7.9	215	T3C	NST	EUV	NC
58R		73	50	1500	5.3	264	T3C	NST	EUV	NC
73R		91	50	1500	5.7	230	T3C	NST	EUV	NC
88R		110	50	1500	6.8	221	T3C	NST	EUV	NC
56R		64	60	1800	5.5	274	T3C	NST	EUV	NC
66R		83	60	1800	5.3	227	T3C	NST	EUV	NC
90R		113	60	1800	6.7	219	T3C	NST	EUV	NC
105R		131	60	1800	7.9	215	T3C	NST	EUV	NC

Engine type approval available from ABS, BV, DNV, GL, NKK, RINA, CRS.

(continued)

C4.4

GENERATOR SET

(continued)

SPECIFICATIONS

In-line 4, 4-Stroke-Cycle Diesel		
Aspiration	T, TA	
Bore x Stroke	4.13 x 5.0 in	105 x 127 mm
Displacement	269 cu in	4.4 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	2736 - 3389 lb	1241 - 1537 kg

DIMENSIONS

	LE	H	WE
min.	66.4 in/1687 mm	49 in/1245 mm	38.3 in/974 mm
max.	80.2 in/2037 mm	78.7 in/1999 mm	38.8 in/986 mm

C7.1

Electronic Control System

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3, IMO Tier II & IMO Tier II/III Switchable

ekW@.8pf	ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
100		125	50	1500	7.9	229.6	T3C	NST	EUV ¹	NC
118		148	50	1500	9.2	227.5	T3C	NST	EUV ¹	NC
150		188	50	1500	11.2	216.5	T3C	II/III	NC	NC
118		148	60	1800	9.5	233.6	T3C	NST	EUV ¹	NC
150		188	60	1800	11.3	219.4	T3C	II/III	NC	NC
175		219	60	1800	13.2	219.5	T3C	II/III	NC	NC
200		250	60	1800	14.9	216.4	T3C	II/III	NC	NC
92R		115	50	1500	7.8	263.6	T3C	NST	EUV ¹	NC
111R		139	50	1500	9.3	251.3	T3C	NST	EUV ¹	NC
143R		179	50	1500	11.3	239.8	T3C	II/III	NC	NC
106R		133	60	1800	9.1	254.2	T3C	NST	EUV ¹	NC
138R		173	60	1800	11.1	243.5	T3C	II/III	NC	NC
163R		204	60	1800	12.7	231.5	T3C	II/III	NC	NC

Engine type approval available from ABS, BV, DNV, GL, LR, NKK, RINA, CRS, CCS.

All ratings subject to IMO can be configured as an IMO II engine without aftertreatment.

¹ Contact your local dealer for availability of EU Stage V Inland Waterways Certification

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	4.13 x 5.3 in	105 x 135 mm
Displacement	433.3 cu in	7.01 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	3355 - 4718 lb	1522 - 2140 kg

DIMENSIONS

	LE	H	WE
min.	76.3 in/1940 mm	49.7 in/1263 mm	37.6 in/956 mm
max.	102 in/2582 mm	62.3 in/1583 mm	39.0 in/993 mm

C9.3

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
200	250	50	1500	13.6	203.0	NC	II	NC	C-II ²
195	244	50	1500	13.7	208.8	NC	II/III	NC	
250	313	50	1500	17.0	202.3	NC	II	NC	C-II ²
245	306	50	1500	17.4	211.0	NC	II/III	NC	
250	313	60	1800	18.2	216.4	T3C	II	NC	C-II ²
250	313	60	1800	18.3	217.5	NC	II/III	NC	
300	375	60	1800	21.5	213.0	T3C	II	NC	C-II ²
185R	231	50	1500	13.6	203.0	NC	II	NC	C-II ²
180R	225	50	1500	13.7	208.8	NC	II/III	NC	
235R	294	50	1500	17.0	202.3	NC	II	NC	C-II ²
230R	288	50	1500	17.4	211.0	NC	II/III	NC	
224R	280	60	1800	18.2	216.4	T3C	II	NC	C-II ²
224R	280	60	1800	18.3	217.5	NC	II/III	NC	
274R	343	60	1800	21.5	213.0	T3C	II	NC	C-II ²

² Only available via DTO.

(continued)

C9.3

GENERATOR SET

(continued)

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	4.13 x 5.31 in	115 x 149 mm
Displacement	568 cu in	9.3 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	5219 lb	2367 kg

DIMENSIONS

	LE	H	WE
min.	85.8 in/2179 mm	56.5 in/1436 mm	50.4 in/1260 mm
max.	85.8 in/2179 mm	56.5 in/1436 mm	50.4 in/1260 mm

C18

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

IMO Tier II

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
280	350	50	1500	19.9	209.5	NC	II	NC	
360	450	50	1500	25.2	209.0	NC	II	NC	C-I ²
360 ¹	450	50	1500	24.9	206.6	NC	II/III	NC	
410	513	50	1500	28.7	208.0	NC	II	NC	C-I ²
410	513	50	1500	28.2	204.8	NC	II/III	NC	
465	581	50	1500	32.3	209.0	NC	II	NC	C-I ²
465	581	50	1500	32.2	207.7	NC	II/III	NC	
345	431	60	1800	25.4	217.0	NC	II	NC	C-I ²
430	538	60	1800	31.5	215.0	NC	II	NC	C-I ²
565	706	60	1800	40.4	214.0	NC	II	NC	C-I ²
565	706	60	1800	41.1	218	NC	II/III	NC	
260R	325	50	1500	19.2	209.5	NC	II	NC	
335R	419	50	1500	25.2	209.0	NC	II	NC	C-I ²
335R ¹	419	50	1500	24.9	206.6	NC	II/III	NC	
390R	486	50	1500	28.7	208.0	NC	II	NC	C-I ²
390R	486	50	1500	28.2	204.8	NC	II/III	NC	
445R	556	50	1500	32.3	208.7	NC	II	NC	C-I ²
445R	556	50	1500	32.2	207.7	NC	II/III	NC	
310R	388	60	1800	25.4	217.0	NC	II	NC	C-I ²
395R	494	60	1800	31.5	215.0	NC	II	NC	C-I ²
530R	663	60	1800	40.4	214.0	NC	II	NC	C-I ²
530R	663	60	1800	41.1	218	NC	II/III	NC	

Generator set package includes SRMP generator.

¹ Only available via DTO. Fuel sulfur restrictions apply.

² Only available by DTO.

(continued)

C18

Electronic Control System

GENERATOR SET

(continued)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 3 & IMO Tier II

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
430	538	60	1800	32.3	220.0	T3C	II	NC	C-I ²
565	706	60	1800	40.1	212.7	T3C	II	NC	C-I ²
565	706	60	1800	41.2	281.3	T3C	II/III	NC	
395R	594	60	1800	32.2	220.0	T3C	II	NC	C-I ²
530R	663	60	1800	40.1	212.7	T3C	II	NC	C-I ²
530R	663	60	1800	41.2	218.3	T3C	II/III	NC	

Generator set package includes SRMP generator.

² Only available by DTO.

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA, TTA	
Bore x Stroke	5.7 x 7.2 in	145 x 183 mm
Displacement	1106 cu in	
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	8733 - 9974 lb	3961 - 4524 kg

DIMENSIONS

	LE	H	WE
min.	119.7 in/3040 mm	66.3 in/1684 mm	60.9 in/1547 mm
max.	119.7 in/3040 mm	66.3 in/1684 mm	60.9 in/1547 mm

C32

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

IMO Tier II/IMO Tier III

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
550	688	50	1500	37.9	203.8	NC	II	IW*	C-1
830	1038	50	1500	57.0	207.0	NC	II	IW*	
830	1038	50	1500	57.8	210.3	NC	II/III	NC	
730	913	60	1800	51.8	210.4	NC	II	IW*	C-1
730	913	60	1800	TBD	TBD	NC	II/III	NC	
940	1175	60	1800	64.9	207.2	NC	II	IW*	C-1
940	1175	60	1800	65.0	207.9	NC	II/III	NC	
525R	656	50	1500	37.9	203.8	NC	II	IW*	C-1
795R	994	50	1500	57.0	207.0	NC	II	IW*	
795R	994	50	1500	57.8	210.3	NC	II/III	NC	
675R	844	60	1800	51.8	210.4	NC	II	IW*	C-1
675R	844	60	1800	TBD	TBD	NC	II/III	NC	
880R	1100	60	1800	64.9	207.2	NC	II	IW*	C-1
880R	1100	60	1800	65.0	207.9	NC	II/III	NC	

Heat Exchanger (32°C Sea Water Temp), Keel Cooled (52°C SCAC Temp).

* EU Stage IIIA and CCNR II certification > 300 kW will not be available after December 2019.

Contact your local dealer for availability.

(continued)

C32

GENERATOR SET

(continued)

RATINGS AND FUEL CONSUMPTION

U.S. EPA Tier 4 Final and IMO Tier III

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
830	1038	50	1500	63.3	202.1	NC	III	IW*
940	1175	60	1800	70.8	204.3	T4C	III	IW*
795R	994	50	1500	63.3	202.1	NC	III	IW*
880R	844	60	1800	70.8	204.3	T4C	III	IW*

Heat Exchanger (32°C Sea Water Temp), Keel Cooled (52°C SCAC Temp)

* EU Stage IIIA and CCNR II certification > 300 bkW will not be available after December 2019.
Contact your local dealer for availability.

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	5.7 x 6.4 in	145 x 162 mm
Displacement	1959 cu in	32.1 liter
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	15,721 lb	7131 kg

DIMENSIONS

	LE	H	WE
min.	168.2 in/4271 mm	65.6 in/1667 mm	
max.	175.3 in/4452 mm	65.6 in/1667 mm	

C280-6

Electronic Control System

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
1650	2063	60	900	106.4	195.5	NC	II	NC
1820	2275	60	900	116.9	195.5	NC	II	NC
1760	2200	50	1000	116.4	200.0	NC	II	NC
1940	2425	50	1000	127.7	200.0	NC	II	NC

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	6773 cu in	111 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	34,500 lb	15,680 kg
Generator weight (approx)	18,000 lb	8165 kg

DIMENSIONS

	LE	LG	H	WE
min.	145 in/3691 mm	280.3 in/7120 mm	154.9 in/3934 mm	77.2 in/1961 mm
max.	145 in/3691 mm	280.3 in/7120 mm	154.9 in/3934 mm	77.2 in/1961 mm

C280-8

Electronic Control System

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
2200	2750	60	900	136.5	188.6	T4C	III	NC
2420	3025	60	900	150.1	188.5	T4C	III	NC
2350	2938	50	1000	148.2	191.5	NC	II	NC
2600	3250	50	1000	161.4	189.3	NC	II	NC

SPECIFICATIONS

In-line 8, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	9031 cu in	148 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	41,800 lb	19,000 kg
Generator weight (approx)	25,000 lb	11,340 kg

DIMENSIONS

	LE	LG	H	WE
min.	178 in/4511 mm	316.5 in/8040 mm	155.0 in/3937 mm	77.2 in/1961 mm
max.	178 in/4511 mm	316.5 in/8040 mm	155.0 in/3937 mm	77.2 in/1961 mm

C280-12

Electronic Control System

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
3300	4125	60	900	212.7	195.4	T4C	III	NC
3640	4550	60	900	233.8	195.5	T4C	III	NC
3520	4400	50	1000	232.7	199.9	NC	II	NC
3880	4850	50	1000	255.5	200.0	NC	II	NC

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	13546 cu in	222 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	57,276 lb	25,980 kg
Generator weight (approx)	33,000 lb	14,790 kg

DIMENSIONS

	LE	LG	H	WE
min.	161 in/4087 mm	316.5 in/8040 mm	160.8 in/4085 mm	78.7 in/2000 mm
max.	161 in/4087 mm	316.5 in/8040 mm	160.8 in/4085 mm	78.7 in/2000 mm

C280-16

Electronic Control System

GENERATOR SET

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
4400	5500	60	900	272.9	188.5	T4C	III	NC
4840	6050	60	900	300.2	188.6	T4C	III	NC
4700	5875	50	1000	296.4	191.5	NC	II	NC
5200	6500	50	1000	322.8	189.3	NC	II	NC

SPECIFICATIONS

Vee 16, 4-Stroke-Cycle Diesel		
Aspiration	TA	
Bore x Stroke	11.0 x 11.8 in	280 x 300 mm
Displacement	18,062 cu in	222 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	68,343 lb	31,000 kg
Generator weight (approx)	40,000 lb	18,145 kg

DIMENSIONS

	LE	LG	H	WE
min.	197 in/5007 mm	366.7 in/9314 mm	164.1 in/4167 mm	78.3 in/1990 mm
max.	197 in/5007 mm	366.7 in/9314 mm	164.1 in/4167 mm	78.3 in/1990 mm

GENERATOR SET ENGINE / AUXILIARY

RATINGS AND FUEL CONSUMPTION

ekW@.8pf	ekW@1.0pf	kVA	Hz	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
65		81	50	1500	5.3	264	T3C	NST	EUV	NC
80		100	50	1500	5.7	230	T3C	NST	EUV	NC
99		124	50	1500	6.8	221	T3C	NST	EUV	NC
65		81	60	1800	5.5	274	T3C	NST	EUV	NC
75		94	60	1800	5.3	227	T3C	NST	EUV	NC
99		124	60	1800	6.7	219	T3C	NST	EUV	NC
118		148	60	1800	7.9	215	T3C	NST	EUV	NC

¹ Contact your local dealer for availability of EU Stage V Inland Waterways certification.

SPECIFICATIONS

In-line 3, 4-Stroke-Cycle Diesel		
Aspiration	T, TA	
Bore x Stroke	4.13 x 5.0 in	105 x 127 mm
Displacement	269 cu in	4.4 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	1200 - 1278 lb	545 - 580 kg

DIMENSIONS

	LE	H	WE
min.	33.7 in/856 mm	40.9 in/1038 mm	30.6 in/778 mm
max.	33.7 in/856 mm	40.9 in/1038 mm	32.0 in/814 mm

C7.1

VARIABLE SPEED AUXILIARY ENGINE

RATINGS AND FUEL CONSUMPTION

Variable Speed Auxiliary

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
280	208	2300	14.9	226.0	T3C	II	NC	NC

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel

Aspiration	TA	
Bore x Stroke	4.13 x 5.31 in	105 x 135 mm
Displacement	428 cu in	7.01 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	1676 lb	760 kg

DIMENSIONS

	LE	H	WE
min.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm
max.	43.1 in/1095 mm	34.5 in/876 mm	31.4 in/798 mm

C9.3

GENERATOR SET ENGINE/AUXILIARY

RATINGS AND FUEL CONSUMPTION

Constant Speed

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
292	218	1500	13.9	202.6	NC	II	NC	C-II
282	210	1500	13.8	208.6	NC	II/III	NC	
362	270	1500	17.2	202.2	NC	II	NC	C-II
351	262	1500	17.4	211	NC	II/III	NC	
369	275	1800	18.6	215.1	T3C	II	NC	C-II
363	271	1800	18.5	216.8	NC	II/III	NC	
436	325	1800	21.8	212.8	T3C	II	NC	C-II

Variable Speed Auxiliary

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
375	280	1800	19.3	219.1	T3C	II	NC	

¹ Contact your local dealer for details on availability on IMO III ratings. Power may vary slightly from IMO II rating.

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel

Aspiration	TA	
Bore x Stroke	4.53 x 5.87 in	115 x 149 mm
Displacement	568 cu in	9.3 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	2083 - 2474 lb	945 - 1122 kg

DIMENSIONS

	LE	H	WE
min.	57.2 in/1452 mm	43.0 in/1093 mm	38.5 in/978 mm
max.	57.2 in/1452 mm	43.0 in/1093 mm	38.5 in/978 mm

C18

GENERATOR SET ENGINE/AUXILIARY

RATINGS AND FUEL CONSUMPTION

IMO Tier II

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
404	301	1500	19.9	210.0	NC	II	NC	
514	383	1500	25.2	209.0	NC	II	NC	C-1
514 ¹	383	1500	24.9	206.6	NC	II/III	NC	
587	438	1500	28.7	208.0	NC	II	NC	C-1
587	438	1500	28.2	204.8	NC	II/III	NC	
660	492	1500	32.3	209.0	NC	II	NC	C-1
660	492	1500	32.2	207.7	NC	II/III	NC	
499	372	1800	25.4	217.0	NC	II	NC	C-1
624	465	1800	31.5	215.0	NC	II	NC	C-1
803	599	1800	40.4	214	NC	II	NC	C-1
803	599	1800	41.1	218	NC	II/III	NC	

U.S. EPA Tier 3 & IMO Tier II

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
624	465	1800	32.2	220.2	T3C	II	NC	C-1
803	599	1800	40.1	212.7	T3C	II	NC	C-1
803	599	1800	41.2	218.3	T3C	II/III	NC	

¹ Only available via DTO. Fuel sulfur restrictions apply.

(continued)

C18

GENERATOR SET ENGINE/AUXILIARY

(continued)

SPECIFICATIONS

In-line 6, 4-Stroke-Cycle Diesel		
Aspiration	TA, TTA	
Bore x Stroke	5.7 x 7.2 in	145 x 183 mm
Displacement	1106 cu in	
Rotation (from flywheel end)	Counterclockwise	
Generator set weight (approx)	4299 lb	1950 kg

DIMENSIONS

	LE	H	WE
min.	73.0 in/1854 mm	51.2 in/1300 mm	44.6 in/1134 mm
max.	73.0 in/1854 mm	51.2 in/1300 mm	44.6 in/1134 mm

C32

GENERATOR SET ENGINE/AUXILIARY

RATINGS AND FUEL CONSUMPTION

IMO Tier II/IMO Tier III

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
791	590	1500	37.9	203.8	NC	II	IW*	C-1
923	688	1500	44.0	203.0	NC	II	IW*	C-1
1172	874	1500	57.0	207.0	NC	II	IW*	
1172	874	1500	57.9	210.3	NC	II/III	NC	
916	683	1800	45.3	210.8	NC	II	IW*	C-1
1047	781	1800	51.8	210.4	NC	II	IW*	C-1
1047	781	1800	TBD	TBD	NC	II/III	NC	
1333	994	1800	64.9	207.2	NC	II	IW*	C-1
1333	994	1800	65.1	207.9	NC	II/III	NC	

U.S. EPA Tier 4 Final & IMO Tier III

bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU	China
1172	874	1500	55.6	202.1	NC	III	IW ²	
1332	994	1800	64.0	204.4	T4C	III	IW ²	

* EU Stage IIIA and CCNR II certification > 300 bkW will not be available after December 2019. Contact your local dealer for availability.

SPECIFICATIONS

Vee 12, 4-Stroke-Cycle Diesel		
Aspiration	TTA	
Bore x Stroke	5.7 x 6.4 in	145 x 162 mm
Displacement	1959 cu in	32.1 liter
Rotation (from flywheel end)	Counterclockwise	
Engine dry weight (approx)	6950 - 7160 lb	3152 - 3248 kg

DIMENSIONS

	LE	H	WE
min.	83.5 in/2121 mm	60.9 in/1547 mm	60.2 in/1528 mm
max.	89.9 in/2284 mm	62.5 in/1587 mm	60.2 in/1528 mm

3500 SERIES

Electronic Control System

AUXILIARY/DIESEL ELECTRIC PROPULSION

RATINGS AND FUEL CONSUMPTION

DEP - 50 HZ

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
3512B	1686	1257	1500	77.4	195.7	NC	II	NC
3512C	1826	1362	1500	84.7	197.5	NC	II	NC
3516C	2303	1717	1500	110.3	203.9	NC	II	NC
3516C	2602	1940	1500	122.6	200.8	NC	II	NC

DEP - 60 HZ

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
3512C	1920	1431	1800	91.9	204.0	NC	II	C-I
3512C	2183	1628	1800	110.2	215.1	NC	II	C-I
3512C	2394	1786	1800	119.7	212.4	NC	II	C-I
3516C	2575	1920	1800	120.4	201.7	NC	II	C-I
3516C	3151	2350	1800	148.9	201.4	NC	II	C-I
3512E²	2188	1632	1800	104.0	202.4	T4C	III	NC
3512E²	2400	1789	1800	113.2	200.9	T4C	III	NC
3516E²	2576	1921	1800	122.7	202.9	T4C	III	NC
3516E²	2822	2105	1800	135.1	203.7	T4C	III	NC
3516E²	3176	2368	1800	152.4	204.3	T4C	III	NC
3516E^{2,3}	3004	2240	1800	*	*	NC	II/III	NC

* Contact your local dealer for technical specifications.

¹ EU Stage IIIA and CCNR II certification > 300 bkW will not be available after December 2019. Contact your local dealer for availability.

² High displacement engine (HD).

³ Only available via DTO.

(continued)

3500 SERIES

Electronic Control System

AUXILIARY/DIESEL ELECTRIC PROPULSION

(continued)

RATINGS AND FUEL CONSUMPTION

Auxiliary - IMO Tier II & III/U.S. EPA T4F

	bhp	bkW	rpm	ekW*	EPA	IMO	EU
3512C	1920	1432	1800	1360	NC	II	NC
3512C¹	2183	1628	1800	1550	NC	II	NC
3512C¹	2394	1786	1800	1700	NC	II	NC
3516C¹	3151	2350	1800	2250	NC	II	NC
3512E¹	2188	1632	1800	1550	T4C	II/III	NC
3512E¹	2400	1789	1800	1700	T4C	II/III	NC
3516E¹	2576	1921	1800	1825	T4C	II/III	NC
3516E¹	2822	2105	1800	2000	T4C	II/III	NC
3516E¹	3176	2368	1800	2250	T4C	II/III	NC
3512E¹	1694	1263	1500	1200	NC	II/III	NC
3516E¹	2301	1716	1500	1630	NC	II/III	NC
3516E¹	2595	1937	1500	1840	NC	II/III	NC

¹ Ratings are high displacement (HD).

* ekW is based on a 95% generator efficiency.

Contact dealer for design-to-order generator set solutions.

(continued)

3500 SERIES

AUXILIARY/DIESEL ELECTRIC PROPULSION

(continued)

RATINGS AND FUEL CONSUMPTION

Variable Speed DEP

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
3512C²		1425	1600	*	*	NC	II	NC
3512C²		1729	1800	*	*	NC	II	NC
3512C²		1765	1800	*	*	NC	II	NC
3516C²		1771	1600	*	*	NC	II	NC
3516C²		1910	1800	*	*	NC	II	NC
3516C²		2240	1800	*	*	NC	II	NC
3516C²	3151	2350	1800	*	*	NC	II	NC
3512E^{1,2}	1700	1268	1600	*	*	T4C	II/III	NC
3512E^{1,2}	1810	1350	1600	*	*	T4C	II/III	NC
3512E¹	2400	1789	1800	119.7	199.9	T4C	II/III	NC
3516E¹	2576	1921	1800	122.7	202.9	T4C	II/III	NC
3516E¹	3176	2368	1800	152.3	204.3	T4C	II/III	NC

* Contact your local dealer for technical specifications.

¹ High displacement engine (HD).² Only available via DTO.*(continued)*

3500E SERIES

AUXILIARY/DIESEL ELECTRIC PROPULSION

(continued)

SPECIFICATIONS

Vee 12, Vee 16, 4-Stroke-Cycle Diesel			
Aspiration		TA	
Bore x Stroke		6.7 x 8.5 in	170 x 215 mm
Displacement	3512E	3576 cu in	58.6 liter
	3516E	4766 cu in	78.1 liter
Engine dry weight (approx)	3512E	19,103 lb	8665 kg
	3516E	22,408 lb	10,164 kg

DIMENSIONS

		LE	H	WE
3512E	min.	127.2 in/3232 mm	86.8 in/2205 mm	85.0 in/2160 mm
	max.	127.2 in/3232 mm	86.8 in/2205 mm	85.0 in/2160 mm
3516E	min.	148.5 in/3773 mm	87.6 in/2224 mm	89.9 in/2284 mm
	max.	148.5 in/3773 mm	87.6 in/2224 mm	89.9 in/2284 mm

C280 SERIES

AUXILIARY

RATINGS AND FUEL CONSUMPTION

	bhp	bkW	rpm	U.S. g/h	g/bkW-hr	EPA	IMO	EU
C280-6	2320	1730	900	107.4	197.3	NC	II	NC
C280-6	2481	1850	1000	118.9	204.4	NC	II	NC
C280-6	2548	1900	900	118.6	198.4	NC	II	NC
C280-6	2722	2030	1000	131.7	206.2	NC	II	NC
C280-8	3084	2300	900	142.7	193.0	T4C	III	NC
C280-8	3299	2460	1000	153.2	197.9	NC	II	NC
C280-8	3393	2530	900	153.8	190.7	T4C	III	NC
C280-8	3634	2710	1000	170.3	199.7	NC	II	NC
C280-12	4640	3460	900	217.4	198.0	T4C	III	NC
C280-12	4962	3700	1000	237.7	204.2	NC	II	NC
C280-12	5096	3800	900	237.0	196.3	T4C	III	NC
C280-12	5444	4060	1000	263.4	206.2	NC	II	NC
C280-16	6169	4600	900	278.5	192.7	T4C	III	NC
C280-16	6598	4920	1000	306.4	197.9	NC	II	NC
C280-16	6785	5060	900	307.0	190.7	T4C	III	NC
C280-16	7268	5420	1000	340.6	199.7	NC	II	NC

C280 fuel rate is at rated power, BSFC is at full power condition.

(continued)

C280 SERIES

Electronic Control System

AUXILIARY

(continued)

SPECIFICATIONS

In-line 6, In-line 8, Vee 12, Vee 16, 4-Stroke-Cycle Diesel			
Aspiration		TA	
Bore x Stroke		11.0 x 11.8 in	280 x 300 mm
Displacement	C280-6	6773 cu in	111 liter
	C280-8	9031 cu in	148 liter
	C280-12	13,546 cu in	222 liter
	C280-16	18,062 cu in	296 liter
Engine dry weight (approx)	C280-6	34,496 lb	15,680 kg
	C280-8	41,800 lb	19,000 kg
	C280-12	57,276 lb	25,980 kg
	C280-16	62,832 lb	28,500 kg

DIMENSIONS

		L	LE	H	WE
C280-6	min.	168 in/4276 mm	145 in/3691 mm	108 in/2733 mm	68 in/1722 mm
	max.	168 in/4276 mm	145 in/3691 mm	108 in/2733 mm	68 in/1722 mm
C280-8	min.	219 in/5561 mm	178 in/4511 mm	104 in/2641 mm	68 in/1722 mm
	max.	219 in/5561 mm	178 in/4511 mm	104 in/2641 mm	68 in/1722 mm
C280-12	min.	191 in/4861 mm	161 in/4087 mm	140 in/3550 mm	69 in/1741 mm
	max.	191 in/4861 mm	161 in/4087 mm	140 in/3550 mm	69 in/1741 mm
C280-16	min.	216 in/5482 mm	197 in/5007 mm	125 in/3171 mm	67 in/1704 mm
	max.	216 in/5482 mm	197 in/5007 mm	125 in/3171 mm	67 in/1704 mm

Cat Controls and Displays

Powertrain Control System

MSCS – Multi-Station Control System for Conventional Drive Systems

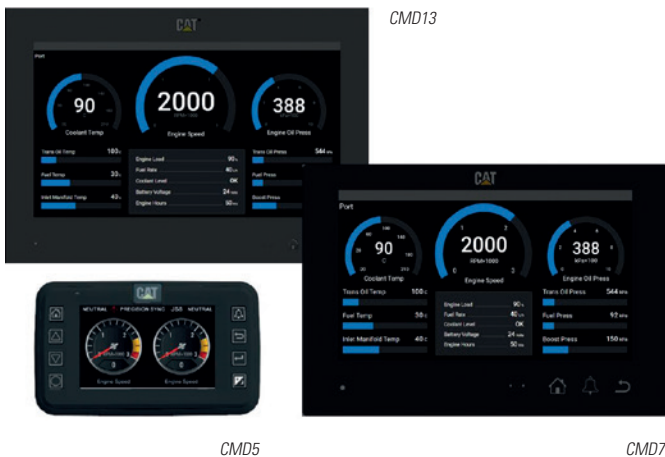
MSCS provides engine and transmission control for single or dual engine applications with up to eight control stations. Control can be easily transferred from one station to another and the fully redundant backup system ensures propulsion system operation if the primary control system fails. Transmission shift logic prevents stalling the engine during quick shifting maneuvers.



Displays

Cat Marine Displays (CMD)

The Cat Marine Display (CMD) provides the operator with easy-to-read, high resolution graphics to monitor all vessel operations. The configurable screen allows for full user customization and visual simplicity. All electronics are environmentally sealed for increased durability and safety and are built to perform reliably in extreme conditions.



The CMD is available with a 5", 8" or 13" screen size. While CMD5 offers more compact size and front and rear waterproof IP 66 rating, as well as appreciated tactile feel of the navigation keys.

New CMD8 and CMD13 Gen II displays offer appealing design and easy to use touch screen navigations. Additional features include multiple graphic skin options, configurable splash and monitoring screens, embedded manuals, Modbus, and IT camera support.

Propulsion, Auxiliary Engine and Genset Control Panels

Cat Control Panels provide complete propulsion engine and generator set control and monitoring from local and remote locations, including engine start/stop capability, alarm and protection, user and integration interfaces. System modularity allows expansion of remote monitoring, input/output capabilities and programmable relays.

Control Panels – Marine Propulsion Engines

C7.1 - C32

Remote Analogue Panel

For remote monitoring of engine basic parameters (available with C7.1 only).

MECP IB

The MECP IB is an inexpensive, basic control panel that can be mounted directly on the engine. For non MCS approved installations.

C9.3-3500 (C175 and C280)*

** See dealer for availability.*

MECP II/LECP II

The MECP II/LECP II is MCS type-approved for manned and un-manned engine rooms. It provides local throttle control, a color display, advanced diagnostics, and integration possibilities. It can optionally be enhanced with remote connectivity modules.

MECP IIIB/LECP III

The MECP IIIB has all the features of the MECP II and has additional I/O, supports more expansion modules, and has extra space for customer options. It also includes all necessary modules for remote connection of the engine.

Control Panels – Marine Generator Set and Auxiliary Engines

C4.4 - C7.1

MGGP 200

(for electronically controlled engines only)

The MGGP 200 is a basic gauge panel providing basic instrumentation of engine parameters, as well as alarm indication and engine start/stop buttons.

MCS3

The MCS3 MCS type-approved panel provides generator and engine monitoring for manned and un-manned engine rooms.

It includes MODbus and CANbus (J1939) interfaces (on electronically controlled engines only), AC monitoring, and optional load share control for multiple genset installations.

Multi-position – left, right, rear, plus power – remote mountable.

C4.4 - C32

EMCP 4.2B

(for electronically controlled engines only)

The EMCP 4.2B non MCS type-approved panel provides generator and engine monitoring.

MGCP II

The MGCP II is MCS type-approved for manned and un-manned engine rooms. It provides local throttle control, a color display and advanced diagnostics and communications. It can optionally be enhanced with remote connectivity modules.

C9.3 - 3500 (C175 and C280)*

** See dealer for availability.*

MGCP IIIB/LECP III

The MGCP IIIB is MCS type-approved that has all the features of the MGCP II and has additional I/O supports, more expansion modules and has extra space for customer options. It also includes all necessary modules for remote connection of the engine.

L2

The L2 includes a CMPD as the main operator interface. It also has switches for engine protection override, prelube override, torque limit and manual speed control.

Accessories

RTD Module

The RTD Module monitors 8 RTD temperature sensors. It is generally used on a generator.

Thermocouple Module

The TC Module monitors 20 thermocouple temperature sensors. It is generally used on an engine.

Remote Panel 220E (MECP/MGCP II and III only)

The RP 220E can remotely monitor and start/stop two engines or gensets. Multiple RPs can be installed on a ship.

Remote Panel 410E (MECP/MGCP II and III only)

The RP 410E can remotely monitor and start/stop eight engines or gensets and four IP cameras. Multiple RPs can be installed on a ship.

Remote I/O 410 Module (MECP/MGCP II and III only)

The RIO 410 provides additional switch and sensor inputs for the control panel, as well as relay outputs. Up to four RIOs can be used with the IIIB panels, one with the II panels.

Relay Module (MECP/MGCP III only)

The ARM provides 14 programmable relays. It can be connected to the Local Control Panel or to an RP.

Power Analyzer Module (MGCP II and III only)

The PAM provides generator power information, such as phase voltage, current, power factor, Total Harmonic Distortion (THD), etc.

MSDU – Emergency Shutdown Module

Basic shutdown unit available as an option with C4.4 and C7.1 electronically controlled engine.

Cat Selective Catalytic Reduction (SCR)

A simple technical solution can help you meet today's stringent maritime emission standards.

The easy-to-install Cat SCR System is an exhaust gas aftertreatment solution compliant with U.S. Environmental Protection Agency (EPA) Tier 4 Final and International Maritime Organization (IMO) Tier III emission standards. It is a sustainable solution to reduce NO_x emissions without sacrificing Caterpillar's marine engine efficiency, as well as maintain the durability and reliability that our customers expect. Regional initiatives from environmentally friendly governments are already in effect with incentives benefitting ship owners who invest in NO_x emissions reduction technology. Caterpillar has evaluated multiple solutions, and the conclusion has been that SCR is the optimal solution to meet U.S. EPA Tier 4 and IMO Tier III requirements. SCR allows for the lowest total cost of ownership when compared to other solutions, such as EGR.

Features and Benefits

- Designed for NO_x emissions reduction in line with U.S. EPA Tier 4 Final and IMO Tier III requirements
- Compact package and flexible mounting configurations
- A fully integrated and certified solution, all available from the engine OEM
- Available for new vessel construction and retrofit/repower projects
- Easy to install with minimum impact to vessel design
- Common control and monitoring system for reliable and safe operation
- Global dealer network for installation and service in any location

Clean Emission Module (CEM)

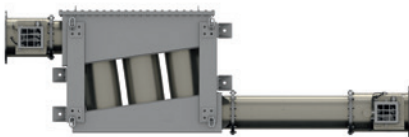
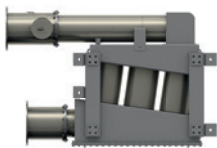
Caterpillar designed the SCR System for Cat marine applications with a compact and easy to install Clean Emission Module (CEM). You will benefit from an optimally matched system with minimum impact to vessel design. Thus, we offer several different CEM configurations to suit all markets and vessel types.



Cat C7.1 and C9.3 CEM
Airless, IMO Tier II/III switchable



Cat C18 double CEM with Y-Pipe
Airless, IMO Tier II/III switchable



Cat C18 and C32 CEM
Air-Assist, U.S. EPA Tier 4 and IMO Tier III
U-Flow or Z-Flow configured



Cat 3500 series CEM
Air-Assist, U.S. EPA Tier 4, IMO Tier II/III
switchable U-Flow or Z-Flow configured



Cat C280 CEM
Air-Assist, U.S. EPA Tier 4 and IMO II/III
switchable vertical stack



Examples: Dosing cabinet

Contact your local dealer for more information.

All pictures shown are for illustration purpose only. Product may vary due to product enhancement.



YOUR PARTNER IN SUCCESS FROM THE ENGINE ROOM & BEYOND



**CAT® CONCIERGE
SERVICE**

**CAT® MARINE
DIGITAL SERVICES**

See page 80 for more information.

Cat Services



Customer Value Agreements (CVA)

Caterpillar Marine and our global dealer network aim to deliver services to our customers to achieve:

- Higher uptime and minimize operating cost
- Integrate Service Solutions & offering to increase overall customer satisfaction

It is important to us that you enjoy valued services that support your engines' operations throughout your vessels' lifecycle while capitalizing on data driven insight into your engine operations and efficiency.

Through a CVA, we want to provide you with the flexibility in choosing the right services from a portfolio of offerings to meet your operational requirements at different stages of vessel life. A Cat CVA offers:

1. Hassle-Free Ownership
2. Hassle-Free Maintenance
3. Peace of Mind from Equipment Health Management
4. Security of Expert Dealer Support

With a full suite of services available, speak to your dealer to tailor a solution that best suits your needs. Pick up a brochure from your dealer to find out more about Cat CVAs or visit cat.com/marineCVA



Extended Service Coverage (ESC)

From design and engineering to performance and support, Cat is the most reliable name in power. Extended Service Coverage (ESC) from Caterpillar increases this reliability as far out as you want to go – with complete confidence. We offer total coverage for new, used, overhauled and upgraded engines and generator sets, protecting your investment and your peace of mind; and because ESC is transferable, it may increase the resale value of your Cat powered vessel.

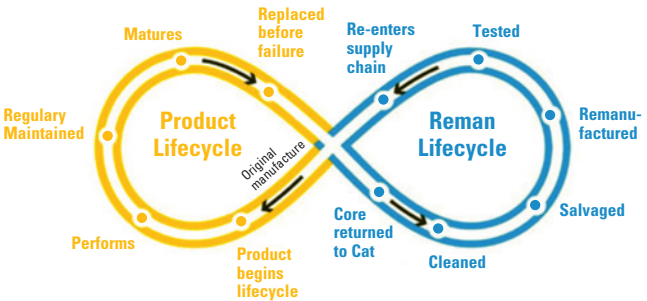
ESC protects against unexpected repair bills and rising parts and labor costs by providing 100% parts and labor reimbursement for covered components (less any applicable deductible), and our global service network ensures prompt, quality repairs by trained technicians. The broad range of coverage options – which can be customized to suit your individual needs – combined with simple pricing, provides confidence and peace of mind toward your engine's performance, today and tomorrow.

There are multiple options for both ESC coverage and Customer Value Agreements (CVAs). For more information, contact your local dealer or visit us at cat.com/marineCVA

Remanufactured Parts (Reman)

Remanufactured parts provide same-as-new performance and reliability at a fraction of the cost of new, with the same warranty as new parts. This means you achieve maximum engine productivity at a lower life cycle cost. Remanufacturing is also environmentally conscious, as it limits waste.

Remanufacturing is a process that returns an end-of-life product core to specifications of the original product using a combination of reused, repaired, and new parts in a manufacturing environment.



Cat S•O•SSM Fluid Analysis

Boost your bottom line with routine fluid analysis

What if you could save thousands of dollars in owning and operating costs every year just by doing a single service? With Cat[®] S•O•S Services, you can. This routine check-up for your oil, coolant and fuel delivers valuable insights you can use to prevent unexpected failures and unplanned downtime.

All you have to do is provide the sample. Our fluid analysis experts do the rest – using proprietary processes, sophisticated chemistry and the latest technology to reveal excessive wear, contaminated fluids or other “unseen” issues. What’s more, you can enjoy greater value in your Customer Value Agreement (CVA) by including Cat[®] S•O•S Services. Contact your dealer to learn more about Cat[®] S•O•S Services and how you can incorporate the services into your CVA.



Modernizing Your Fleet

**Today's technology – your engines.
Thinking about the future? So are we!**

Whether you're driven by regulations or a need to modernize your fleet to meet tomorrow's emissions requirements, Caterpillar has short term and long-term options that can help manage your overall modernization costs and support you as you navigate market trends.

Beyond tier upgrades and emissions reductions kits, Caterpillar is developing solutions such as hybrid engines, identifying alternate fuel benefits, and incorporating digital applications to generate service-based outcomes for operational needs. Reach out to your local Caterpillar dealer representative to learn more.

Worldwide Dealer Network

Caterpillar's global dealer network has broad capabilities and is the strongest in the world, ensuring customer access to complete solutions for your equipment needs. From people at the local branch to those at the corporate level – we offer global support at the local level. Service locations offer dealer personnel who know and understand their local market, their customers, and their customers' businesses.

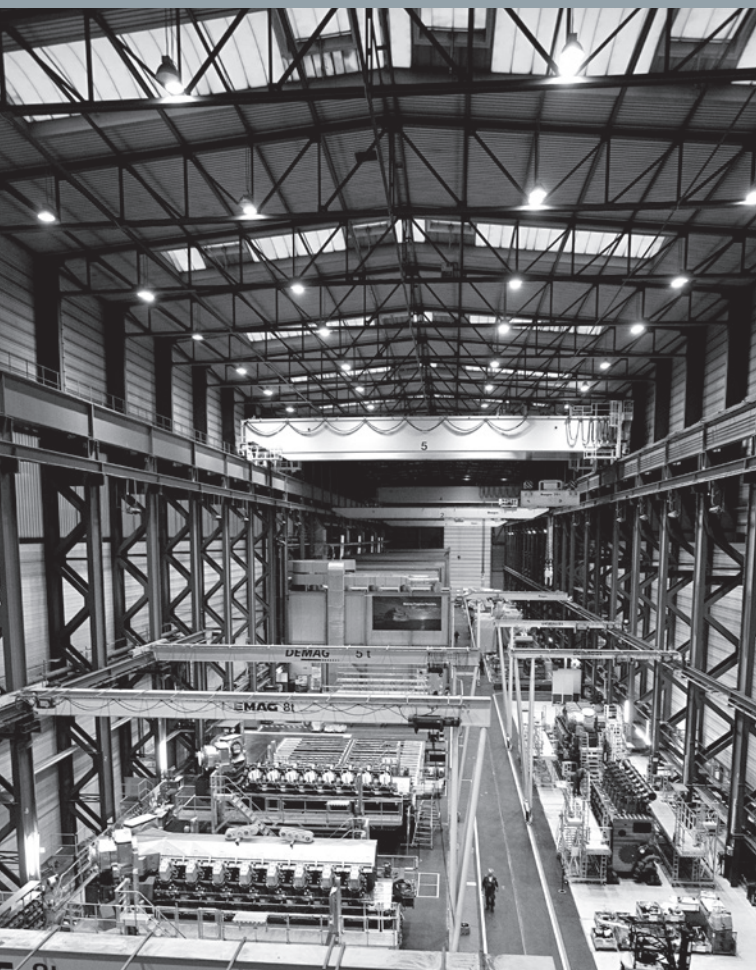
Cat dealer field service capability is second to none. Your uptime is maximized with the fastest response time available, and qualified, experienced field service technicians with the expertise and equipment to quickly diagnose and fix problems. Our technicians know Cat products and solutions, and deliver the same world-class support to you – wherever and whenever you need it.

To find your nearest dealer, please visit:

https://www.cat.com/en_US/support/dealer-locator.html

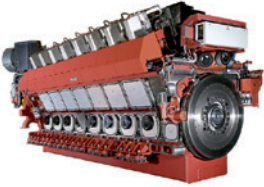


MaK Medium-Speed Diesel and Dual Fuel Solutions



MaK

MaK Propulsion Engines



MaK Marine Propulsion Engines

Caterpillar Motoren GmbH & Co. KG and the excellent reputation of the MaK brand are based on more than 90 years of experience in the development, manufacture, and service of gas, diesel, and dual fuel engines.

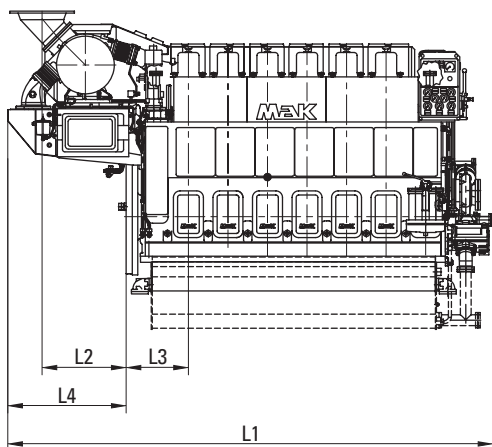
The current MaK product line, comprised of six medium-speed, four-stroke diesel and dual fuel engine models, ranges in power from 1,020 to 16,800 kW. MaK engines feature an extremely high level of reliability, low operating costs, simple installation and maintenance, and meet current engine exhaust emission standards. Please contact your local dealer for specific emissions compliance.

M 20 C

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	H4	W1	W2	Weight	
											Wet sump	Dry sump
6 M 20 C	4049	702	520	988	1714	630	330	941	1591	627	11.5	10.9
8 M 20 C	4846	802	520	1125	1856	630	330	941	1727	710	14.5	13.8
9 M 20 C	5176	802	520	1125	1856	630	330	941	1727	710	16.0	15.0

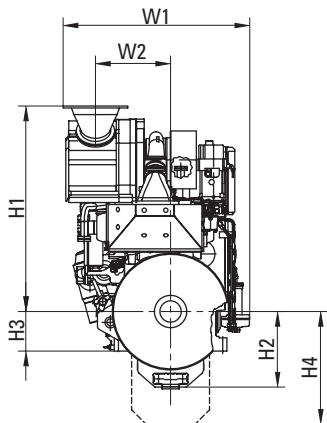


TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
						100%	85%
	kW	mhp	rpm	bar	m/s	g/kWh	g/kWh
6 M 20 C	1020	1387	900	24.1	9.0	189	188
	1080	1468	900	25.5	9.0	191	189
	1140	1550	1000	24.2	10.0	190	189
	1200	1632	1000	25.5	10.0	192	190
8 M 20 C	1360	1849	900	24.1	9.0	189	188
	1440	1958	900	25.5	9.0	191	189
	1520	2067	1000	24.2	10.0	190	189
	1600	2175	1000	25.5	10.0	192	190
9 M 20 C	1530	2080	900	24.1	9.0	189	188
	1620	2203	900	25.5	9.0	191	189
	1710	2325	1000	24.2	10.0	190	189
	1800	2447	1000	25.5	10.0	192	190

Stroke: 300 mm
Bore: 200 mm

Specific lubricating oil consumption 0.6 g/kWh
* SFOC data shown are related to IMO Tier II emission limits.
Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Engine centre distance: 2010 mm

Removal of cylinder liner:
in transverse direction: 1910 mm
in longitudinal direction: 2085 mm

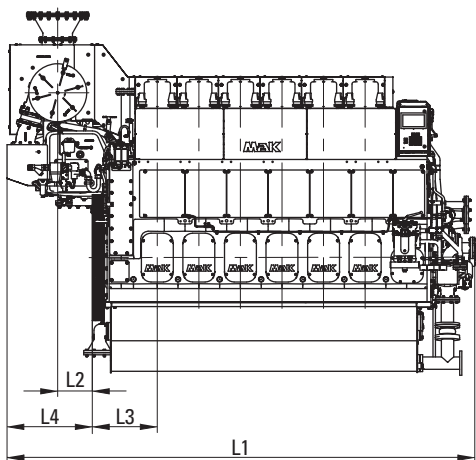
Engine with turbocharger at free end available, ask for dimensions.

M 25 E

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	H4	W1	W2	Weight	
											Wet sump	Dry sump
6 M 25 E	4840	358	672	883	2255	861	460	1191	2080	850	23.5	21.2
8 M 25 E	5700	338	672	883	2430	861	460	1191	2230	937	30.0	28.5
9 M 25 E	6130	338	672	883	2430	861	460	1191	2230	937	32.0	30.0



TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
						100%	85%
	kW	mhp	rpm	bar	m/s	g/kWh	g/kWh
6 M 25 E	1800	2447	720	24.5	9.6	184	183
	1800	2447	750	23.5	10.0	184	183
	2100	2855	720	28.6	9.6	187	183
	2100	2855	750	27.4	10.0	187	183
8 M 25 E	2400	3263	720	24.5	9.6	184	183
	2400	3263	750	23.5	10.0	184	183
	2800	3807	720	28.6	9.6	187	183
	2800	3807	750	27.4	10.0	187	183
9 M 25 E	2700	3671	720	24.5	9.6	184	183
	2700	3671	750	23.5	10.0	184	183
	3150	4283	720	28.6	9.6	187	183
	3150	4283	750	27.4	10.0	187	183

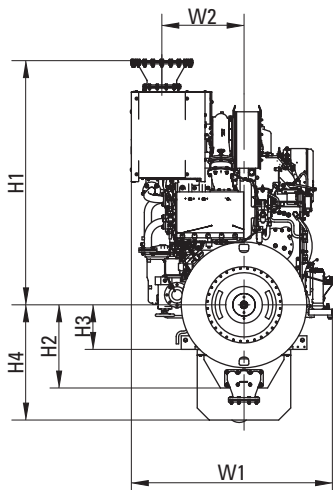
Stroke: 400 mm
Bore: 255 mm

Specific lubricating oil consumption 0.6 g/kWh,
Reduced part load fuel consumption ratings available for
constant and variable speed.

Propeller optimized ratings available.

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR
installed based on elevated exhaust gas back pressure limit.



Engine centre distance: 2500 mm

Removal of cylinder liner:
in transverse direction: 2510 mm
in longitudinal direction: 2735 mm

Engine with turbocharger at free end
available, ask for dimensions.

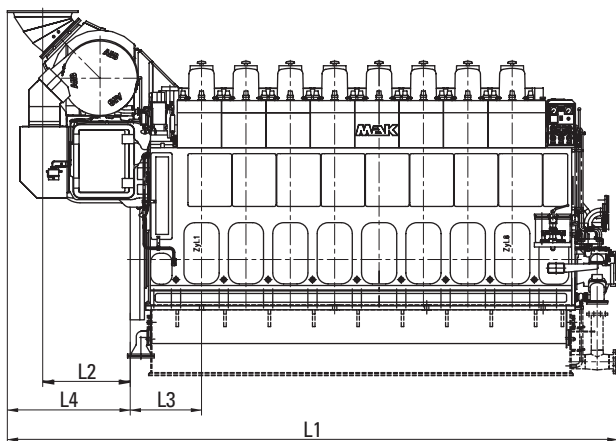
Please contact us for lead times.

M 32 C

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	H4	W1	W2	W3	Weight	
												Wet sump	Dry sump
6 M 32 C	5936	788	852	1170	2784	1052	550	1392	2368	962	2140	41.6	39.5
8 M 32 C	7293	1044	852	1467	2969	1052	550	1392	2182	262	2140	51.7	49.0
9 M 32 C	7823	1044	852	1467	2969	1052	550	1392	2182	262	2140	55.0	52.0



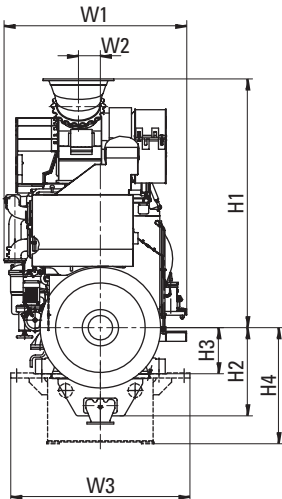
TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
	kW	mhp				100%	85%
			rpm	bar	m/s	g/kWh	g/kWh
6 M 32 C	2880	3916	600	24.9	9.6	177	176
	3000	4079	600	25.9	9.6	177	176
8 M 32 C	3840	5221	600	24.9	9.6	177	176
	4000	5438	600	25.9	9.6	177	176
9 M 32 C	4320	5873	600	24.9	9.6	177	176
	4500	6118	600	25.9	9.6	177	176

Stroke: 480 mm
Bore: 320 mm

Specific lubricating oil consumption 0.6 g/kWh

* SFOC data shown are related to IMO Tier II emission limits



Engine centre distance: 2800 mm*

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3405 mm

Engine with turbocharger at free end available, ask for dimensions.

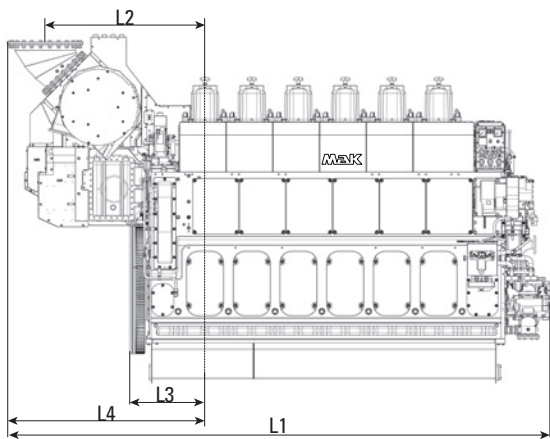
* If turbocharger is located on opposite coupling side, the water cover of the charge air cooler must be dismantled.

M 32 E

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	H4	W1	W2	Weight
6 M 32 E	6,148	1,812	852	2,240	2,900	1,052	550	1,220	2,368	126	37.5
8 M 32 E	7,318	1,837	852	2,265	3,053	1,052	550	1,220	2,182	190	46.4
9 M 32 E	7,848	1,837	852	2,265	3,053	1,052	550	1,220	2,182	190	49.4



TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
						100%	85%
	kW	mhp	rpm	bar	m/s	g/kWh	g/kWh
6 M 32 E	3300	4487	720	24.8	11.0	179	178
	3300	4487	750	23.8	11.5	179	178
	3480	4731	720	26.1	11.0	179	177
	3480	4731	750	25.1	11.5	179	177
8 M 32 E	4400	5982	720	24.8	11.0	179	178
	4400	5982	750	23.8	11.5	179	178
	4640	6309	720	26.1	11.0	179	177
	4640	6309	750	25.1	11.5	179	177
9 M 32 E	4950	6730	720	24.8	11.0	179	178
	4950	6730	750	23.8	11.5	179	178
	5220	7097	720	26.1	11.0	179	177
	5220	7097	750	25.1	11.5	179	177

Stroke: 460 mm

Bore: 320 mm

Specific lubricating oil consumption 0.6 g/kWh, reduced part load fuel consumption ratings available for constant and variable speed.

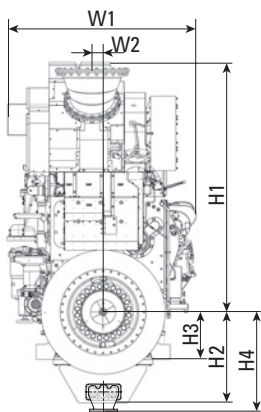
* SFOC data shown are related to IMO Tier II emission limits. Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.

Ratings below 3 MW are available on request.

Engine centre distance: 2800 mm

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3400 mm

Engine with turbocharger at free end available, ask for dimensions.

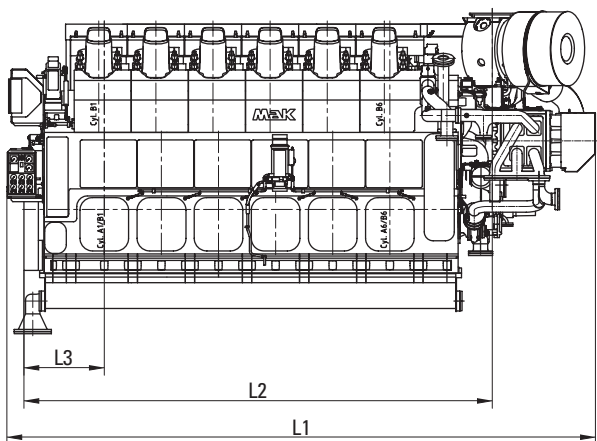


VM 32 E

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	H1	H2	H3	W1	W2	Weight
12 M 32 E	6956	5535	949	2450	1205	750	2985	1133	65.0
16 M 32 E	8328	6885	949	2620	1205	750	2985	1133	83.0



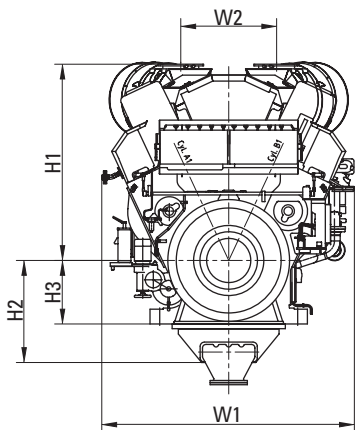
TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption**	
	kW	mhp				100%	85%
			rpm	bar	m/s	g/kWh	g/kWh
12 M 32 E	6600	8973	720	24.8	11.0	179	178
	6600	8973	750	23.8	11.5	179	178
	6960	9463	720	26.1	11.0	179	177
	6960	9463	750	25.1	11.5	179	177
16 M 32 E	8800	11964	720	24.8	11.0	179	178
	8800	11964	750	23.8	11.5	179	178
	9280	12617	720	26.1	11.0	179	177
	9280	12617	750	25.1	11.5	179	177

Stroke: 460 mm
Bore: 320 mm

Specific lubricating oil consumption 0.6 g/kWh,
Reduced part load fuel consumption ratings available for
constant and variable speed.

* SFOC data shown are related to IMO Tier II emission limits.
Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR
installed based on elevated exhaust gas back pressure limit.



Engine centre distance: 3500 mm

Removal of cylinder liner:
in transverse direction: 2836 mm

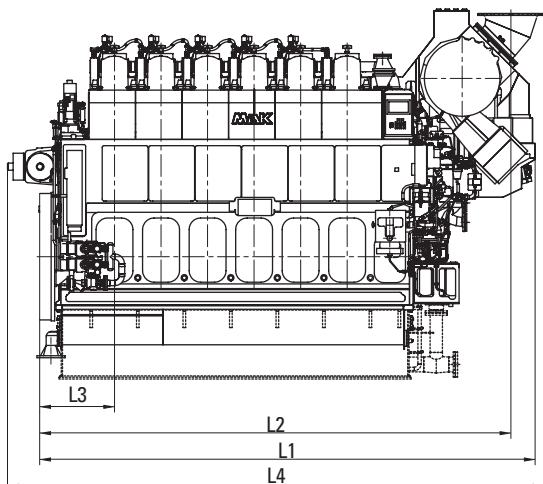
Engine with turbocharger at driving
end available, ask for dimensions.

M 34 DF

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	H4	H5	W1	W2	W3	Weight
6 M 34 DF	6079	5366	852	6109	2767	1052	550	2817	1392	2303	126	2140	39.5
8 M 34 DF	7139	6533	852	7325	2970	1052	550	2995	1392	2303	191	2140	49.0
9 M 34 DF	7669	7063	852	7855	2970	1052	550	2995	1392	2303	191	2140	52.0

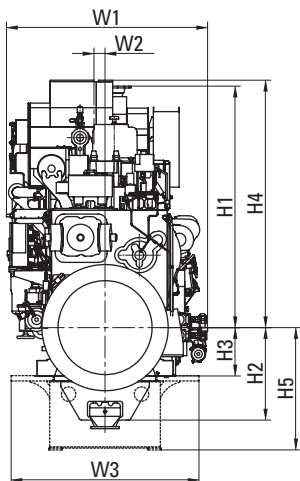


TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec energy consumption (Gas mode)	
	kW	mhp				rpm	bar	m/s	100% 85%
							g/kWh	kJ/kWh	
6 M 34 DF	3180	4324	720	21.2	11.0	183/183	7450/7620		
	3300	4487	750	21.1	11.5	186/186	7560/7730		
8 M 34 DF	4240	5765	720	21.2	11.0	183/183	7450/7620		
	4400	5982	750	21.1	11.5	186/186	7560/7730		
9 M 34 DF	4770	6485	720	21.2	11.0	183/183	7450/7620		
	4950	6730	750	21.1	11.5	186/186	7560/7730		

Stroke: 460 mm
Bore: 340 mm

Maximum continuous rating according to ISO 3046/1.
IMO Tier III in gas mode, in diesel mode with optional
MaK SCR.



Engine centre distance: 2800 mm

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3400 mm

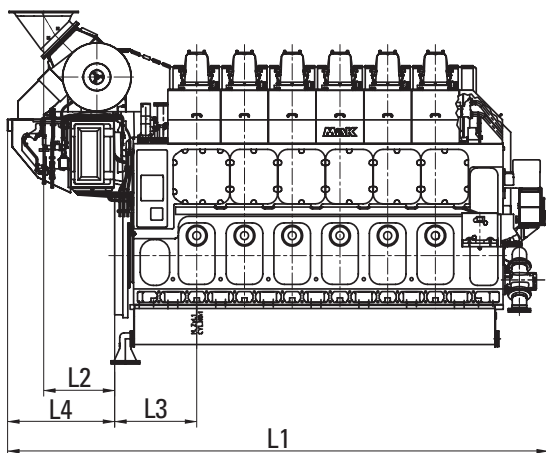
Engine with turbocharger at free end
available, ask for dimensions.

M 43 C

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	W1	W2	Weight
6 M 43 C	8271	1086	1255	1638	3734	1396	750	2878	215	91.0
7 M 43 C	9068	1119	1255	1704	4105	1396	750	2878	232	107.0
8 M 43 C	9798	1119	1255	1704	4105	1396	750	2878	232	117.0
9 M 43 C	10528	1119	1255	1704	4105	1396	750	2878	232	127.0



TECHNICAL DATA

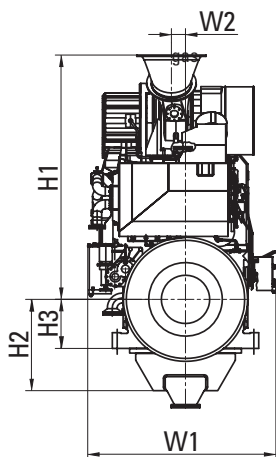
Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
						100%	85%
	kW	mhp	rpm	bar	m/s	g/kWh	g/kWh
6 M 43 C	6000	8158	500	27.1	10.2	177	175
	6000	8158	514	26.4	10.5	177	175
	6300	8565	500	28.4	10.2	178	176
	6300	8565	514	27.7	10.5	178	176
7 M 43 C	7000	9517	500	27.1	10.2	177	176
	7000	9517	514	26.4	10.5	177	175
	7350	9993	500	28.4	10.2	178	176
	7350	9993	514	27.7	10.5	178	176
8 M 43 C	8000	10877	500	27.1	10.2	177	175
	8000	10877	514	26.4	10.5	177	175
	8400	11421	500	28.4	10.2	178	176
	8400	11421	514	27.7	10.5	178	176
9 M 43 C	9000	12236	500	27.1	10.2	177	175
	9000	12236	514	26.4	10.5	177	175
	9450	12848	500	28.4	10.2	178	176
	9450	12848	514	27.7	10.5	178	176

Stroke: 610 mm
Bore: 430 mm

Specific lubricating oil consumption 0.6 g/kWh

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust back pressure limit.



Engine centre distance: 3400 mm

Removal of cylinder liner:
in transverse direction: 4165 mm
in longitudinal direction: 4610 mm

This engine is only available with dry oil sump.

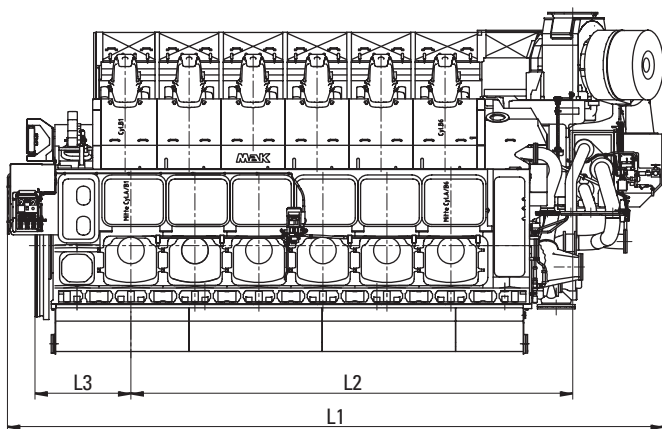
Engine with turbocharger at driving end available, ask for dimensions.

VM 43 C

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	H1	H2	H3	W1	W2	Weight
12 M 43 C	9842	6628	1440	3497	1625	875	3890	1685	160.0
16 M 43 C	11943	8533	1440	3473	1625	875	4027	1670	220.0



TECHNICAL DATA

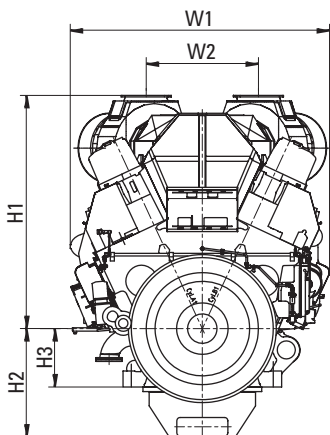
Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
	kW	mhp				100%	85%
			rpm	bar	m/s	g/kWh	g/kWh
12 M 43 C	12000	16315	500	27.1	10.2	177	175
	12000	16315	514	26.4	10.5	177	175
	12600	17131	500	28.4	10.2	178	176
	12600	17131	514	27.7	10.5	178	176
16 M 43 C	16000	21754	500	27.1	10.2	177	175
	16000	21754	514	26.4	10.5	177	175
	16800	22841	500	28.4	10.2	178	176
	16800	22841	514	27.7	10.5	178	176

Stroke: 610 mm
Bore: 430 mm

Specific lubricating oil consumption 0.6 g/kWh

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Engine centre distance: 4500 mm

Removal of cylinder liner:
in transverse direction: 3700 mm

This engine is only available with dry oil sump.

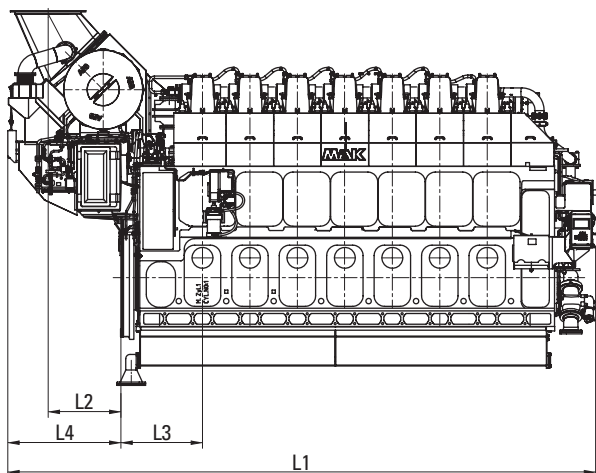
Engine with turbocharger at driving end available, ask for dimensions.

M 46 DF

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	L4	H1	H2	H3	W1	W2	Weight
6 M 46 DF	8330	1086	1255	1723	3734	1396	750	2961	215	96.0
7 M 46 DF	9068	1119	1255	1740	4105	1396	750	2961	232	109.0
8 M 46 DF	9798	1119	1255	1740	4105	1396	750	2961	232	119.0
9 M 46 DF	10768	1119	1255	1740	4072	1396	750	2961	232	132.0

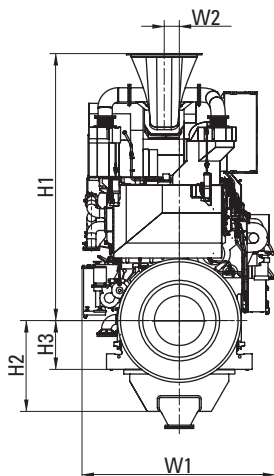


TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec. energy consumption (Gas mode)	
	kW	mhp				100%	85%	100%	85%
			rpm	bar	m/s	g/kWh		kJ/kWh	
6 M 46 DF	5790	7872	500	22.8	10.2	184/182		7350/7370	
	5790	7872	514	22.2	10.5	184/182		7350/7370	
7 M 46 DF	6755	9184	500	22.8	10.2	184/182		7350/7370	
	6755	9184	514	22.2	10.5	184/182		7350/7370	
8 M 46 DF	7720	10496	500	22.8	10.2	184/182		7350/7370	
	7720	10496	514	22.2	10.5	184/182		7350/7370	
9 M 46 DF	8685	11808	500	22.8	10.2	186/185		7350/7460	
	8685	11808	514	22.2	10.5	186/185		7350/7460	

Stroke: 610 mm
Bore: 460 mm

Specific lubricating oil consumption 0.6 g/kWh
IMO Tier III in gas mode, in diesel mode with optional MaK SCR.



Engine centre distance: 3400 mm

Removal of cylinder liner:
in transverse direction: 4165 mm
in longitudinal direction: 4610 mm

This engine is only available with dry oil sump.

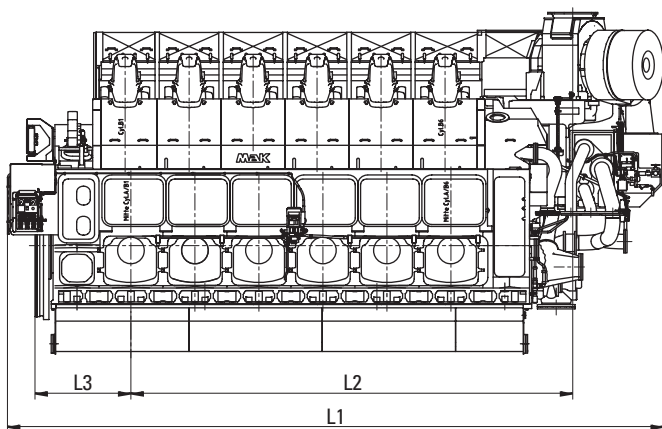
Engine with turbocharger at free end available, ask for dimensions.

VM 46 DF

Propulsion Engine

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1	L2	L3	H1	H2	H3	W1	W2	Weight
12 M 46 DF	9847	6628	1440	3497	1625	875	3890	1685	160.0
16 M 46 DF	11943	8533	1440	3473	1625	875	4027	1670	220.0

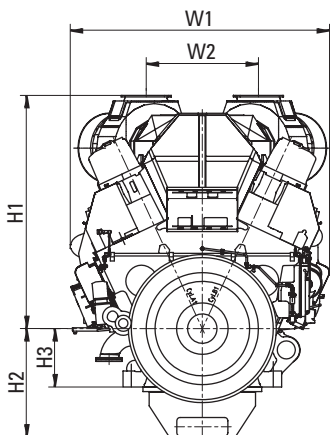


TECHNICAL DATA

Type	Output range		Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec. energy consumption (Gas mode)	
	kW	mhp				100%	85%	100%	85%
			rpm	bar	m/s				
12 M 46 DF	11580	15744	500	22.8	10.2	184/182	7350/7370		
	11580	15744	514	22.2	10.5	185/183	7350/7370		
16 M 46 DF	15440	20992	500	30.5	10.2	184/182	7350/7370		
	15440	20992	514	29.6	10.5	185/183	7350/7370		

Stroke: 610 mm
Bore: 460 mm

Specific lubricating oil consumption 0.6 g/kWh
IMO Tier III in gas mode, in diesel mode with optional MaK SCR.



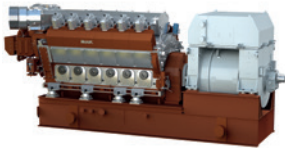
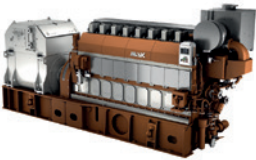
Engine centre distance: 4500 mm

Removal of cylinder liner:
in transverse direction: 3700 mm

This engine is only available with dry oil sump.

Engine with turbocharger at free end available, ask for dimensions.

MaK Generator Sets



MaK Marine Generator Sets

Today's shipping industry relies on dependable on-board electrical power generation. MaK auxiliary diesel engines ensure the availability of electrical power, wherever and whenever needed.

For navigational equipment, monitoring installations, refrigerated containers, lighting, pumps, heating, or ventilation, MaK auxiliary engines are the right choice.

As with MaK propulsion engines, these auxiliary engines can be operated with economical Heavy Fuel Oil (HFO), and meet NO_x limits according to IMO Code Revised MARPOL, Annex VI, NO_x Technical Code 2008, (IMO Tier II).

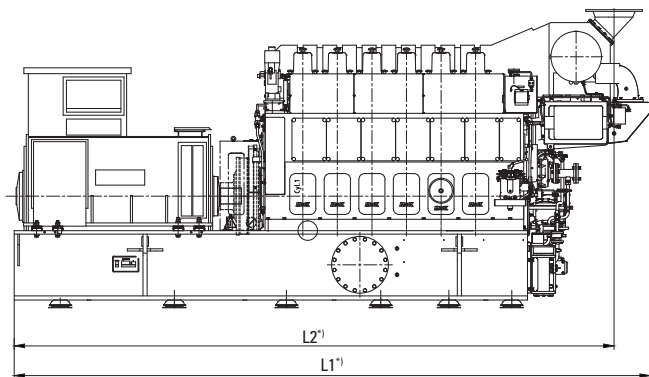
M 20 C

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 20 C	6073	5727	1779	1065	1680	627	21.2
8 M 20 C	6243	5897	1955	1065	1680	710	23.1
9 M 20 C	7438	7116	1955	1065	1680	710	26.0

* Dependent on generator make/type



TECHNICAL DATA

Type	Engine rating	Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
								100%	85%
	kW	kWe	kVA	Hz	rpm	bar	m/s	g/kWh	g/kWh
6 M 20 C	1020	979	1224	60	900	24.1	9.0	189	188
	1080	1037	1296	60	900	25.5	9.0	191	189
	1140	1094	1368	50	1000	24.2	10.0	190	189
	1200	1152	1440	50	1000	25.5	10.0	192	190
8 M 20 C	1360	1306	1632	60	900	24.1	9.0	189	188
	1440	1382	1728	60	900	25.5	9.0	191	189
	1520	1459	1824	50	1000	24.2	10.0	190	189
	1600	1536	1920	50	1000	25.5	10.0	192	190
9 M 20 C	1530	1469	1836	60	900	24.1	9.0	189	188
	1620	1555	1944	60	900	25.5	9.0	191	189
	1710	1642	2052	50	1000	24.2	10.0	190	189
	1800	1728	2160	50	1000	25.5	10.0	192	190

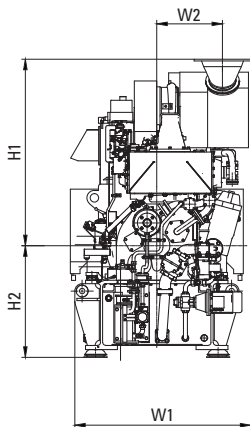
Stroke: 300 mm
Bore: 200 mm

Specific lubricating oil consumption 0.6 g/kWh,

Generator efficiency: 0.96, $\cos \varphi$: 0.8

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Generator set centre distance:
min. 2010 mm

Removal of cylinder liner:
in transverse direction: 1910 mm
in longitudinal direction: 2085 mm

Engine with turbocharger at driving
end available, ask for dimensions.

M 25 E

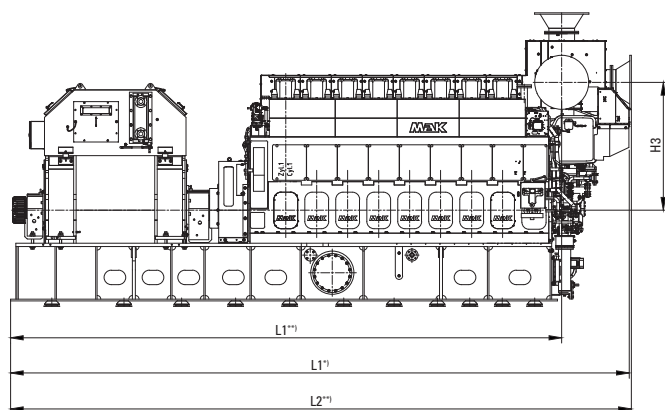
Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1 ^{*)}	L2 ^{*)}	H1	H2	W1	W2	L1 ^{*)}	H3	Dry weight ^{***)}
	Turbocharger nozzle position 0°						Turbocharger nozzle position 90°		
6 M 25 E	6767	7570	2537	1329	2450	850	7720	1734	43.0
8 M 25 E	7390	8356	2736	1329	2450	937	8326	1770	53.0
9 M 25 E	7855	8786	2736	1329	2450	937	8743	1770	56.0

^{*)} Dependent on generator make/type

^{***)} Dry weight depending on generator



TECHNICAL DATA

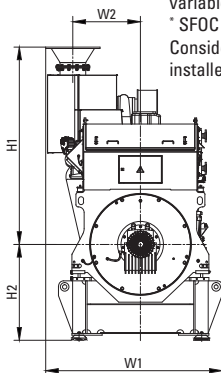
Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
									100%	85%
	kW	kWe	kVA	Hz	rpm	bar	m/s	g/kWh	g/kWh	
6 M 25 E	1800	1728	2160	60	720	24.5	9.6	184	183	
	1800	1728	2160	50	750	23.5	10.0	184	183	
	2100	2016	2520	60	720	28.6	9.6	187	183	
	2100	2016	2520	50	750	27.4	10.0	187	183	
8 M 25 E	2400	2304	2880	60	720	24.5	9.6	184	183	
	2400	2304	2880	50	750	23.5	10.0	184	183	
	2800	2688	3360	60	720	28.6	9.6	187	183	
	2800	2688	3360	50	750	27.4	10.0	187	183	
9 M 25 E	2700	2592	3240	60	720	24.5	9.6	184	183	
	2700	2592	3240	50	750	23.5	10.0	184	183	
	3150	3024	3780	60	720	28.6	9.6	187	183	
	3150	3024	3780	50	750	27.4	10.0	187	183	

Stroke: 400 mm
Bore: 255 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.96, $\cos \varphi$: 0.8

Reduced part load fuel consumption available for constant and variable speed

* SFOC data shown are related to IMO Tier II emission limits.
Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Generator set centre distance:
min. 2700 mm

Removal of cylinder liner:
in transverse direction: 2510 mm
in longitudinal direction: 2735 mm

Engine with turbocharger at driving end available, ask for dimensions.

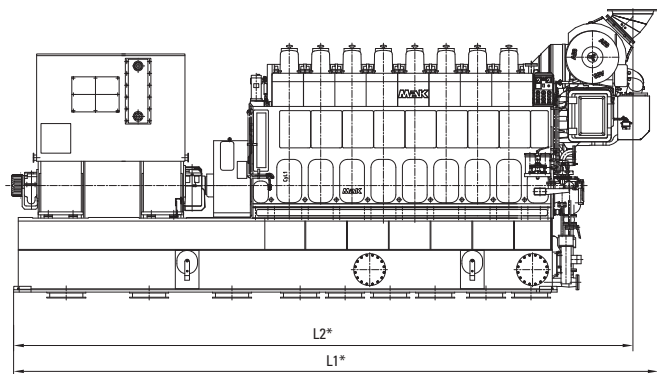
M 32 C

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 32 C	9127	8665	2901	1900	2700	962	75.0
8 M 32 C	10889	10461	2969	1900	2700	262	88.0
9 M 32 C	11245	10991	2969	2180	2700	262	91.0

* Dependent on generator make/type



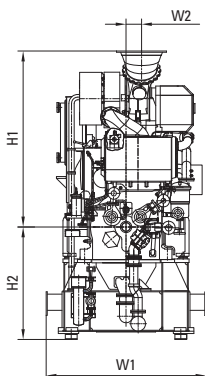
TECHNICAL DATA

Type	Engine rating	Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
								100%	85%
	kW	kWe	kVA	Hz	rpm	bar	m/s	g/kWh	g/kWh
6 M 32 C	2880	2765	3456	50/60	600	24.9	9.6	177	176
	3000	2880	3600	50/60	600	25.9	9.6	177	176
8 M 32 C	3840	3686	4608	50/60	600	24.9	9.6	177	176
	4000	3840	4800	50/60	600	25.9	9.6	177	176
9 M 32 C	4320	4147	5184	50/60	600	24.9	9.6	177	176
	4500	4320	5400	50/60	600	25.9	9.6	177	176

Stroke: 480 mm
Bore: 320 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.96, $\cos \varphi$: 0.8

* SFOC data shown are related to IMO Tier II emission limits



Generator set centre distance:
min. 3000 mm

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3405 mm

Engine with turbocharger at driving
end available, ask for dimensions.

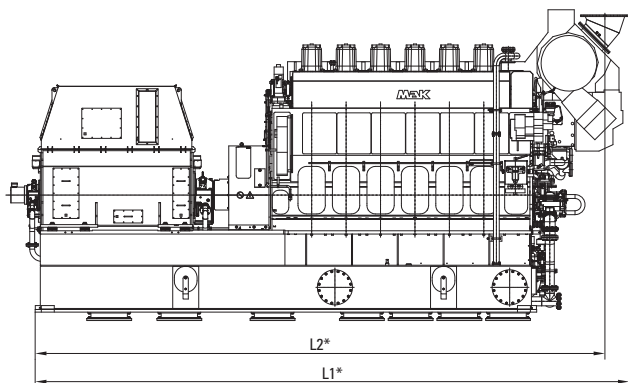
M 32 E

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 32 E	9147	8772	2767	1800	2600	126	73.0
8 M 32 E	10233	10656	2970	1800	2600	191	84.0
9 M 32 E	11533	11110	2970	1800	2600	191	98.0

* Dependent on generator make/type



TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
	kW	kWe	kVA	Hz					rpm	bar
	g/kWh	g/kWh								
6 M 32 E	3300	3168	3960	60	720	24.8	11.0	179	178	
	3300	3168	3960	50	750	23.8	11.5	179	178	
	3480	3341	4176	60	720	26.1	11.0	179	177	
	3480	3341	4176	50	750	25.1	11.5	179	177	
8 M 32 E	4400	4224	5280	60	720	24.8	11.0	179	178	
	4400	4224	5280	50	750	23.8	11.5	179	178	
	4640	4454	5568	60	720	26.1	11.0	179	177	
	4640	4454	5568	50	750	25.1	11.5	179	177	
9 M 32 E	4950	4752	5940	60	720	24.8	11.0	179	178	
	4950	4752	5940	50	750	23.8	11.5	179	178	
	5220	5011	6264	60	720	26.1	11.0	179	177	
	5220	5011	6264	50	750	25.1	11.5	179	177	

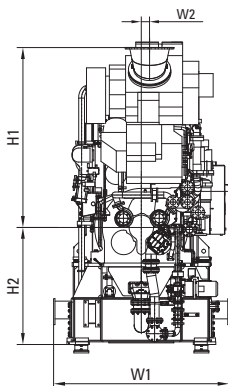
Stroke: 460 mm
Bore: 320 mm

Specific lubricating oil consumption 0.6 g/kWh,

Generator efficiency: 0.96, $\cos \varphi$: 0.8

Reduced part load fuel consumption available for constant and variable speed

* SFOC data shown are related to IMO Tier II emission limits. Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Generator set centre distance:
min. 3000 mm

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3400 mm

Engine with turbocharger at driving end available, ask for dimensions.

Please contact us for lead times.

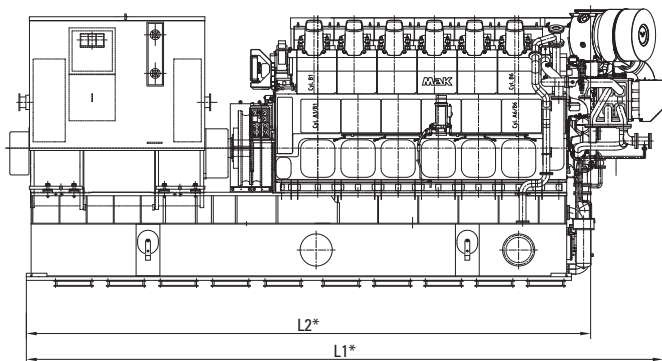
VM 32 E

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
12 M 32 E	10703	9484	2319	2320	3320	1133	120.0
16 M 32 E	12149	10930	2319	2320	3320	1133	140.0

* Dependent on generator make/type



TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
	kW	kWe	kVA	Hz					rpm	bar
	g/kWh	g/kWh								
12 M 32 E	6600	6336	7920	60	720	24.8	11.0	179	178	
	6600	6336	7920	50	750	23.8	11.5	179	178	
	6980	6701	8376	60	720	26.2	11.0	179	177	
	6980	6701	8376	50	750	25.2	11.5	179	177	
16 M 32 E	8800	8448	10560	60	720	24.8	11.0	179	178	
	8800	8448	10560	50	750	23.8	11.5	179	178	
	9280	8909	11136	60	720	26.1	11.0	179	177	
	9280	8909	11136	50	750	25.1	11.5	179	177	

Stroke: 460 mm
Bore: 320 mm

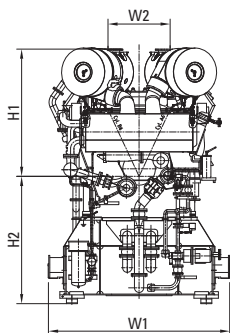
Specific lubricating oil consumption 0.6 g/kWh,

Generator efficiency: 0.96, $\cos \varphi$: 0.8

Reduced part load fuel consumption available for constant and variable speed

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with SCR installed based on elevated exhaust gas back pressure limit.



Generator set centre distance:
min. 3500 mm

Removal of cylinder liner:
in transverse direction: 2836 mm

Engine with turbocharger at driving
end available, ask for dimensions.

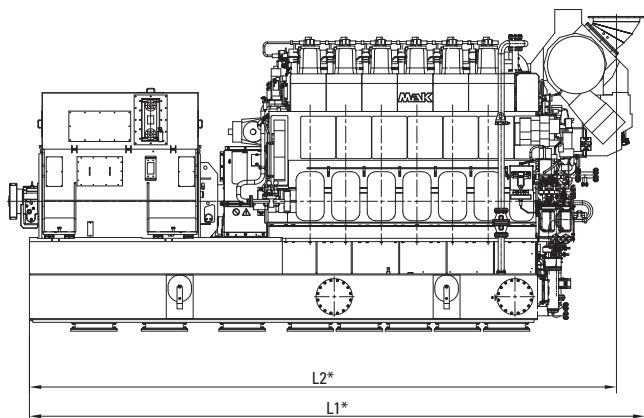
M 34 DF

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 34 DF	9160	8737	2749	1930	2680	127	72.0
8 M 34 DF	10268	9845	2970	1930	2680	191	84.0
9 M 34 DF	10862	10389	2970	1930	2680	191	90.0

* Dependent on generator make/type

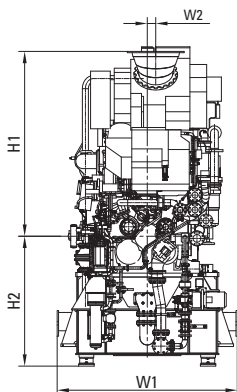


TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec. energy consumption (Gas mode)	
	kW	kWe	kVA	Hz					rpm	bar	m/s	g/kWh
	100%/85%		100%/85%		100%/85%		100%/85%		100%/85%			
6 M 34 DF	3180	3053	3816	60	720	21.2	11.0	183/183	7450/7620			
	3300	3168	3960	50	750	21.1	11.5	186/186	7560/7730			
8 M 34 DF	4240	4070	5088	60	720	21.2	11.0	183/183	7450/7620			
	4400	4224	5280	50	750	21.1	11.5	186/186	7560/7730			
9 M 34 DF	4770	4579	5724	60	720	21.2	11.0	183/183	7450/7620			
	4950	4752	5940	50	750	21.1	11.5	186/186	7560/7730			

Stroke: 460 mm
Bore: 340 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.97, $\cos \varphi$: 0.8
IMO Tier III in gas mode, in diesel mode with MaK SCR only.



Generator set centre distance:
min. 3000 mm

Removal of cylinder liner:
in transverse direction: 3040 mm
in longitudinal direction: 3400 mm

Engine with turbocharger at driving
end available, ask for dimensions.

Please contact us for lead times.

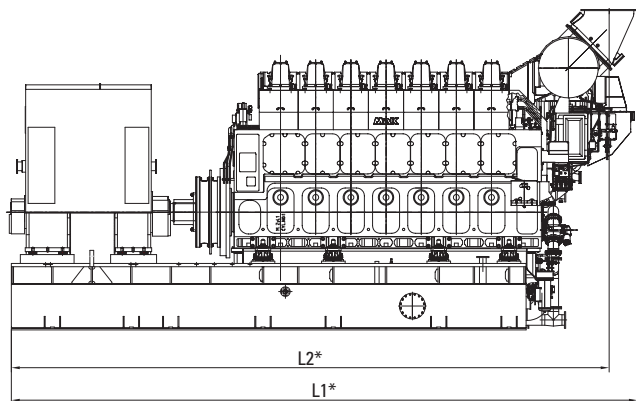
M 43 C

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 43 C	12202	11651	4358	2444	3400	215	178.0
7 M 43 C	12999	12414	4849	2444	3400	232	195.0
8 M 43 C	13729	13144	4849	2444	3400	232	210.0
9 M 43 C	14459	13874	4849	2444	3400	232	240.0

* Dependent on generator make/type



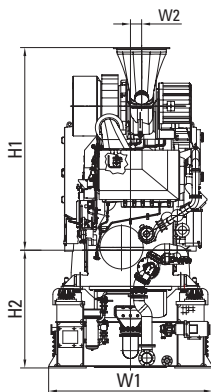
TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
	kW	kWe	kVA	Hz					rpm	bar
	g/kWh	g/kWh								
6 M 43 C	6000	5760	7200	50	500	27.1	10.2	177	175	
	6000	5760	7200	60	514	26.4	10.5	177	175	
	6300	6048	7560	50	500	28.4	10.2	178	176	
	6300	6048	7560	60	514	27.7	10.5	178	176	
7 M 43 C	7000	6720	8400	50	500	27.1	10.2	177	175	
	7000	6720	8400	60	514	26.4	10.5	177	175	
	7350	7056	8820	50	500	28.4	10.2	178	176	
	7350	7056	8820	60	514	27.7	10.5	178	176	
8 M 43 C	8000	7680	9600	50	500	27.1	10.2	177	175	
	8000	7680	9600	60	514	26.4	10.5	177	175	
	8400	8064	10080	50	500	28.4	10.2	178	176	
	8400	8064	10080	60	514	27.7	10.5	178	176	
9 M 43 C	9000	8640	10800	50	500	27.1	10.2	177	175	
	9000	8640	10800	60	514	26.4	10.5	177	175	
	9450	9072	11340	50	500	28.4	10.2	178	176	
	9450	9072	11340	60	514	27.7	10.5	178	176	

Stroke: 610 mm
Bore: 430 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.96, cos ϕ : 0.8

* SFOC data shown are related to IMO Tier II emission limits.
Consider +1 g/kWh SFOC for IMO Tier III ratings with installed
based on elevated exhaust gas back pressure limit.



Generator set centre distance:
min. 3700 mm

Removal of cylinder liner:
in transverse direction: 4165 mm
in longitudinal direction: 4610 mm

VM 43 C

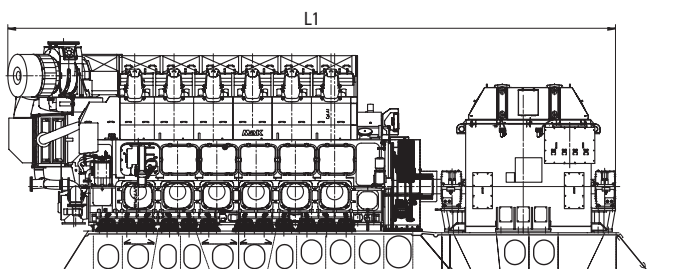
Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	H1	H2	W1	W2	Weight**
12 M 43 C	14855	3497	1088	3890	1684	160.0
16 M 43 C	16940	3473	1088	4027	1670	220.0

* Dependent on generator make/type

** Engine weight only



Foundation Shipyard (example)

TECHNICAL DATA

Type	Engine rating	Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption*	
								100%	85%
	kW	kWe	kVA	Hz	rpm	bar	m/s	g/kWh	g/kWh
12 M 43 C	12000	11520	14400	50	500	27.1	10.2	177	175
	12000	11520	14400	60	514	26.4	10.5	177	175
	12600	12096	15120	50	500	28.4	10.2	178	176
	12600	12096	15120	60	514	27.7	10.5	178	176
16 M 43 C	16000	15360	19200	50	500	27.1	10.2	177	175
	16000	15360	19200	60	514	26.4	10.5	177	175
	16800	16128	20160	50	500	28.4	10.2	178	176
	16800	16128	20160	60	514	27.7	10.5	178	176

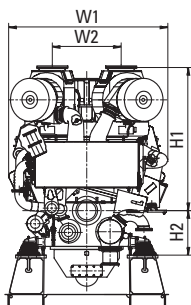
Stroke: 610 mm
Bore: 430 mm

Specific lubricating oil consumption 0.6 g/kWh,

Generator efficiency: 0.96, $\cos \varphi$: 0.8

* SFOC data shown are related to IMO Tier II emission limits.

Consider +1 g/kWh SFOC for IMO Tier III ratings with installed based on elevated exhaust gas back pressure limit.



Foundation Shipyard (example)

Generator set centre distance:
min. 4500 mm

Removal of cylinder liner:
in transverse direction: 3700 mm

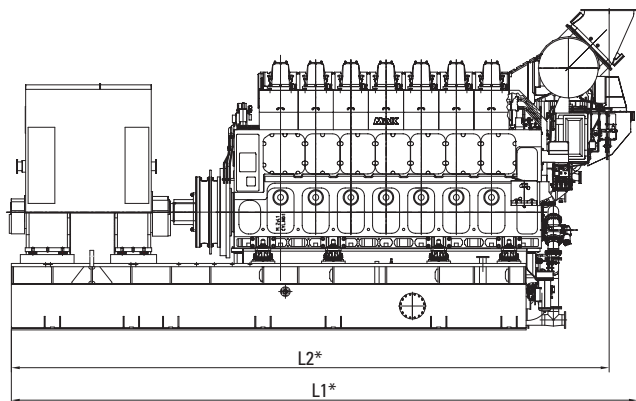
M 46 DF

Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	L2*	H1	H2	W1	W2	Weight*
6 M 46 DF	12202	11651	4358	2444	3400	215	178.0
7 M 46 DF	12999	12414	4849	2444	3400	232	195.0
8 M 46 DF	13729	13144	4849	2444	3400	232	210.0
9 M 46 DF	14459	13874	4849	2444	3400	232	240.0

* Dependent on generator make/type

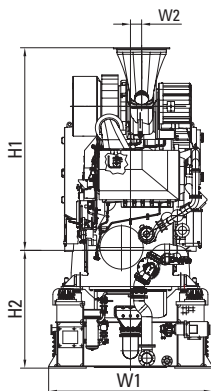


TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec. energy consumption (Gas mode)	
	kW	kWe	kVA	Hz					rpm	bar	m/s	g/kWh
					100%	85%	100%	85%				
6 M 46 DF	5790	5558	6948	50	500	22.8	10.2	184/182	7350/7370			
	5790	5558	6948	60	514	22.2	10.5	184/182	7350/7370			
7 M 46 DF	6755	6485	8106	50	500	22.8	10.2	184/182	7350/7370			
	6755	6485	8106	60	514	22.2	10.5	184/182	7350/7370			
8 M 46 DF	7720	7411	9264	50	500	22.8	10.2	184/182	7350/7370			
	7720	7411	9264	60	514	22.2	10.5	184/182	7350/7370			
9 M 46 DF	8685	8338	10422	50	500	22.8	10.2	186/185	7350/7460			
	8685	8338	10422	60	514	22.2	10.5	186/185	7350/7460			

Stroke: 610 mm
Bore: 460 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.96, $\cos \varphi$: 0.8
IMO Tier III in gas mode, in diesel mode with MaK SCR only.



Generator set centre distance:
min. 3700 mm

Removal of cylinder liner:
in transverse direction: 4165 mm
in longitudinal direction: 4610 mm

Nozzle position: ask for availability.

VM 46 DF

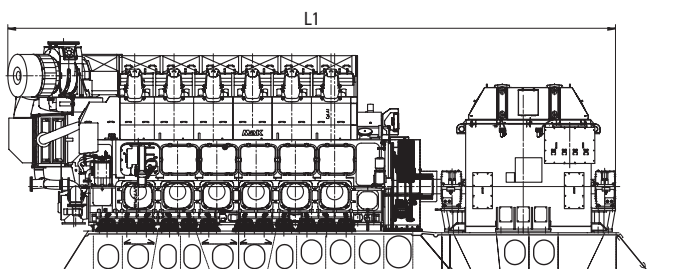
Generator Set

DIMENSIONS (mm) AND WEIGHTS (t)

Type	L1*	H1	H2	W1	W2	Weight**
12 M 46 DF	14855	3497	1088	3890	1684	160.0
16 M 46 DF	16940	3473	1088	4027	1670	220.0

* Dependent on generator make/type

** Engine weight only



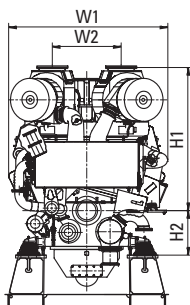
Foundation Shipyard (example)

TECHNICAL DATA

Type	Engine rating		Output range		Frequency	Speed	Mean eff. pressure	Mean piston speed	Spec. fuel consumption (Diesel mode)		Total spec. energy consumption (Gas mode)	
	kW	kWe	kVA	Hz					rpm	bar	m/s	100%/85%
					g/kWh		kJ/kWh					
12 M 46 DF	11580	11117	13896	50	500	22.8	10.2	184/182		7350/7370		
	11580	11117	13896	60	514	22.2	10.5	185/183		7350/7370		
16 M 46 DF	15440	14822	18528	50	500	22.8	10.2	184/182		7350/7370		
	15440	14822	18528	60	514	22.2	10.5	185/183		7350/7370		

Stroke: 610 mm
Bore: 460 mm

Specific lubricating oil consumption 0.6 g/kWh,
Generator efficiency: 0.96, $\cos \varphi$: 0.8
IMO Tier III in gas mode, in diesel mode with MaK SCR only.



Foundation Shipyard (example)

Generator set centre distance:
min. 4500 mm

Removal of cylinder liner:
in transverse direction: 3700 mm

Please contact us for lead times.

General definition of reference conditions

The maximum continuous rating (locked output) stated by Caterpillar Motoren refers to the following reference conditions according to "IACS" (International Association of Classification Societies) for main and auxiliary engines (tropical conditions):

Air pressure:	100 kPa (1 bar)
Air temperature:	318 K (45 °C)
Relative humidity:	60 %
Seawater temperature:	305 K (32 °C)

Reference conditions regarding fuel consumption

Fuel consumption data is based on the following reference conditions:

Intake temperature	298 K (25 °C)
Charge air coolant inlet temperature:	298 K (25 °C)
Net heating value of the diesel oil:	42,700 kJ/kg

Brake specific fuel consumption/heat rate

Brake specific fuel consumption SFOC (g/kWh) and heat rate (kJ/kWh), tolerance 5 %, without engine driven pumps.

For M 20 C and M 25 C engines only:

For each engine driven pump an additional brake specific fuel consumption/heat rate of 1 % has to be calculated.

For all E, DF, M 43 C, VM 43 C and VM 32 C engines:

Additional SFOC/heat rate per engine driven lube oil pump:

Power	100 %	85 %	75 %	50 %	25 %
Constant speed	1.0 %	1.2 %	1.3 %	2.0 %	4.0 %
Prop. curve	1.0 %	1.1 %	1.2 %	1.4 %	2.0 %

Additional SFOC/heat rate per engine driven cooling water pump:

Power	100 %	85 %	75 %	50 %	25 %
Constant speed	0.47 %	0.47 %	0.53 %	0.8 %	1.6 %
Prop. curve	0.4 %	0.4 %	0.4 %	0.4 %	0.4 %

MaK Controls and Displays

aMACS – advanced **M**odular, **A**larm and **C**ontrol System

For all MaK diesel propulsion engines and generator sets:
M 20 C, M 25 E, M 32 C, M 32 E, VM 32 E, M 43 C, VM 43 C

aMACS is a complete alarm, safety and control system – fully configured and tested at factory. It consists of two separate components. The component with sensors, actuators and control units is installed on the engine. A second component is separate from the engine and includes the alarm and safety system, local control panel and customer interface.

With aMACS you can choose between two control panels. While the *Basic Panel* offers basic features such as start-stop control or protection system, the *Advanced Panel* offers additional inputs/outputs, DC/DC converter, slow turn support, etc.

MCS type approved for manned and unmanned engine rooms.



Basic Panel

Advanced Panel

Dimensions (in mm)

	Height	Width	Depth	Weight (approx. in kg)
Basic Panel	800	600	210	60
Advanced Panel	1200	600	300	80

MACS – Modular, Alarm and Control System

For all MaK dual fuel propulsion and generator sets:
M 34 DF, M 46 DF, VM 46 DF

MACS is a complete alarm, safety and control system – fully configured and tested at factory. It consists of base functions such as start-stop control or protection system as well as other for dual fuel engines important functions, e.g. FCT, slow turn, GVU control, and leakage monitoring.

Each engine is equipped with a separate control cabinet (interface between engine and external devices).

MCS type approved for manned and unmanned engine rooms.

Dimensions (in mm)				
	Height	Width	Depth	Weight (approx. in kg)
MACS Control Control Cabinet	2205	1206	605	246

Contact your local dealer for more information.

Selective Catalytic Reduction

MaK Selective Catalytic Reduction (SCR)

MaK SCR technology, used for MaK diesel engines and dual fuel engines in larger vessels, substantially reduces NO_x emissions to meet IMO Tier III standards. At the same time, it reduces particulate matter (PM) and hydrocarbon (HC) emissions, efficiently treating engine-out exhaust without affecting engine performance in any way.

Along with helping the environment, SCR technology saves operators money by lowering taxes and fees when entering emission-controlled areas (ECA) and by maintaining excellent fuel efficiency during vessel operation. Another positive side effect is sound reduction.

In addition, the MaK SCR system requires little space, allows for flexible installation and offers an excellent power-to-weight ratio. During operation, it can switch between the IMO II and IMO III modes to comply with regionally different emissions requirements. The system ensures easy installation and maintenance on board.



The MaK SCR System is available in different sizes for all MaK Marine propulsion and generator sets. It is adaptable for multi-deck, horizontal and vertical installation.

MaK SCR System – key features and benefits:

- High engine power and efficiency while reducing diesel emissions
- Excellent fuel economy while maintaining the right level of performance
- Outstanding noise reduction effect
- Compact solution and flexible installation to meet any engine room requirements
- Easy installation and maintenance on board

MaK Parts and Service

Genuine MaK Parts

Our manufacturing techniques are improved continuously to ensure that using Genuine MaK Parts enhances engine performance and lowers emissions while increasing reliability.

All emission-relevant parts conform to requirements, ensuring that your engine remains compliant with the required regulations and certifications – benefits you may not get from non-original competitive parts. Equally important, all our Genuine MaK Parts are backed up by the Caterpillar Motoren parts warranty.

Parts can be dispatched within 24 hours through our worldwide distribution centers and delivered globally by our authorized distributors.



MaK REParts™ – Repair and Exchange Parts

In addition to the conventional spare parts business, Caterpillar Motoren also offers a broad portfolio of value-added aftersales services including, reconditioning worn parts. We offer our customers extensive repair and exchange options through the MaK Repair and Exchange Parts program (REParts™). By this, MaK parts are returned to their original specifications. This reconditioning is the most cost-efficient and adequate service solution in the industry. It increases the value of your investment and lowers overall owning and operating costs while reducing the impact on the environment.

By sending the exchange parts in advance, we reduce the downtime of your engine. We even take your used components back, and provide you a refund. With the return of your used genuine components, you can save up to 65% of the repair and replacement costs.

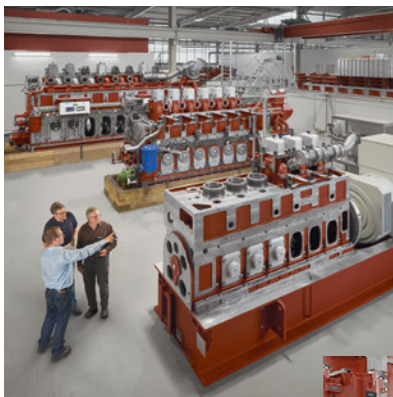
Your engine will be returned to excellent performance and reliability by precise maintenance work with our OEM parts. REParts™ genuine spare parts have the same quality and warranty standards as our new Genuine MaK Parts.



Factory Training – Kiel Engine Training Center

The Caterpillar Engine Training Center in Kiel, Germany, provides customized engine training for customer and dealer personnel.

The courses will teach operators about engine application, new technologies and control and monitoring systems. All courses are on request and held in small groups from four up to eight people.



Customer Value Agreements

Through the network of authorized dealers, Caterpillar offers a wide range of different service solutions. From special agreements for parts and service delivery, providing technical support, staff training, and assistance with maintenance and troubleshooting to complete responsibility for managing customer's assets – you choose whatever fits your needs best.

Customer Value Agreements help to optimize the total maintenance and efficiency of your MaK engines. Aligned motivations and risk-sharing bring us together in one team. With a data-driven focus on engine health, performance, and efficiency, we support you to deliver your business results for your global fleet.



EMD Medium-Speed Diesel and Dual Fuel Solutions



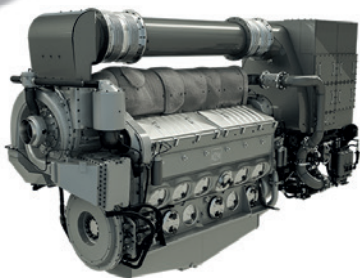
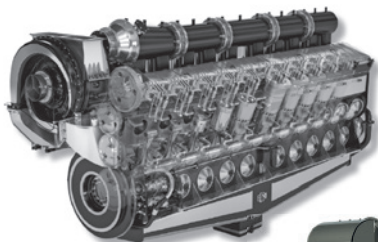
EMD Propulsion and Dual Fuel Engines

EMD E 23 & E 23B (710 Series) Marine Propulsion and Generator Set Engines

EMD Engines have been in the marine propulsion business since 1935. EMD brings two-cycle medium-speed engines to the Caterpillar Marine family, with over 78,000 engines delivered worldwide making it one of the largest medium-speed engine family in the world in operation around the world.

Built on the successful 710 Series, the current EMD product line consists of medium-speed two-cycle diesel and dual fuel engines models ranging in power, from 1,490 to 4,100 kW.

The E 23 (IMO Tier II/U.S. EPA Tier 3) and E 23B (IMO Tier III/U.S. EPA Tier 4 Final) are available in 8, 12, 16 and 20 cylinder configurations with continuous power ratings from 1249 bkw (1675 hp) to 3729 bkw (5000 hp).



E 23B Specifications

- U.S. EPA Tier 4 Final certified
- IMO Tier III emissions compliant
- 200 rpm minimum idle speed
- 900 rpm maximum rated speed
- 230 mm bore x 279 mm stroke
- Welded 710 Series “G” Crankcase
- Turbocharged-aftercooled aspiration
- Electronically governed
- Available as clockwise or counterclockwise rotation
- Engine diagnostics and general alarm
- Programmable parameters

The EMD E 23 Series offers the following features:

Performance Advantage

- Performance of a high-speed engine, with the durability advantage of a medium-speed engine
- Best in-class transient response. Idle to full power in 10 seconds in fixed pitch propeller applications
- 200 rpm low idle speed improves fuel efficiency and operating range flexibility

Total Cost of Ownership Advantage

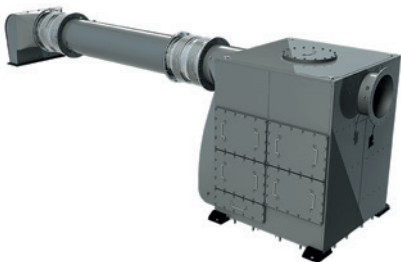
- 30,000 hour or greater overhaul interval with no midlife top end overhaul or oil change required
- Easy, non-invasive inspection of cylinder power assembly component for simple predictive maintenance
- Global dealer network for consistent service in any location

Emission Advantage

- Integrated SCR to optimize NO_x reduction, fuel efficiency, and compact footprint
- Closed crankcase ventilation system and valve stem seals for additional PM reduction
- U.S. EPA Marine Tier 4 Final certified / IMO Tier III compliant

Selective Catalytic Reduction (SCR) System

The EMD SCR system is co-designed by EMD and Caterpillar. The EMD SCR System has been developed especially for the EMD twocycle medium-speed engines to meet U.S. EPA Tier 4 Final and IMO Tier III emission standards. Every component in the EMD SCR System is designed and manufactured to EMD product standards with highest quality and value.



EMD Dual Fuel Options

DGB – Dynamic Gas Blending® (E 23 GB)

Dynamic gas blending (DGB) technology provides the ability to substitute diesel fuel with natural gas at rates as high as 80% while allowing operation with 100% diesel fuel if needed. The engine seamlessly transitions from diesel to gas without interruption of power output. EMD patented DGB kits retain power output, transient response, and reliability of the original diesel. DGB meets IMO Tier II or earlier emission standards.

Consult your dealer for more information regarding dual fuel products.

DIG – Direct Injected Gas (E 23B GD, E 23 GD))

Direct Injected Gas (DIG) technology uses a single injector that injects high pressure diesel, followed by high pressure gas to provide a minimum of 95% gas substitution. The engine operates on the diesel cycle, maintaining the same power and torque throughout the operating range. Based entirely on the diesel cycle, the EMD DIG™ solution represents one of the cleanest and most fuel efficient natural gas technologies. DIG meets IMO Tier III or earlier emission standards.

Consult your dealer for more information regarding dual fuel products.

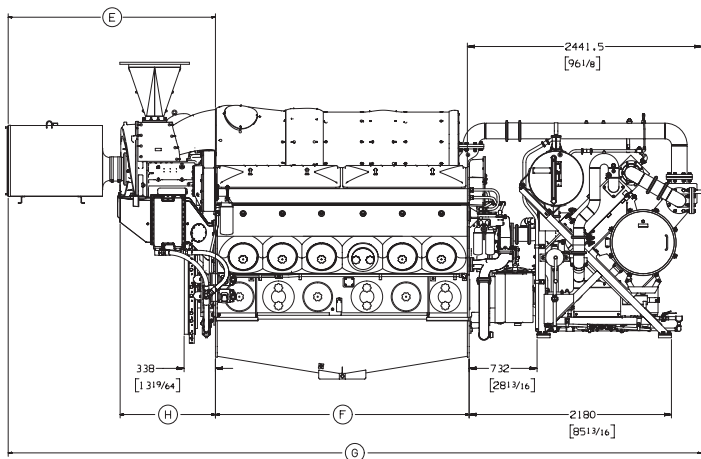
E 23

DIMENSIONS (mm) AND WEIGHTS (kg)

Type	A	B	C	D	E	F	G	H	Engine Weight	Acc. Rack Weights
8 E 23	3246	2573	479	2790	2134	1864	6202	929	13018	1723
12 E 23	3410	2764	632	2948	2240	2734	7178	1050	17690	1723
16 E 23	3410	2764	632	2948	2240	3715	8171	1050	20865	1723
20 E 23	3642	2966	835	3150	2240	4559	9015	1050	23949	1769

DIMENSIONS (in) AND WEIGHTS (lb)

Type	A	B	C	D	E	F	G	H	Engine Weight	Acc. Rack Weights
8 E 23	127.8	101.3	18.9	109.9	84.0	73.4	244.2	36.66	28,700	3,799
12 E 23	134.3	108.8	24.9	116.1	88.2	107.6	282.6	41.3	39,000	3,799
16 E 23	134.3	108.8	24.9	116.1	88.2	146.3	321.7	41.3	45,999	3,799
20 E 23	143.4	116.8	32.9	124.0	88.2	179.5	354.9	41.3	52,799	3,900

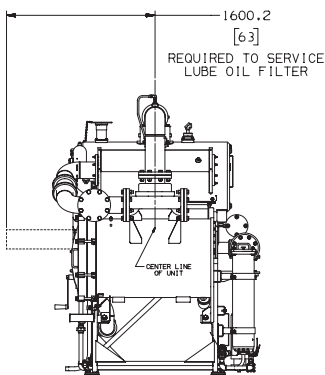
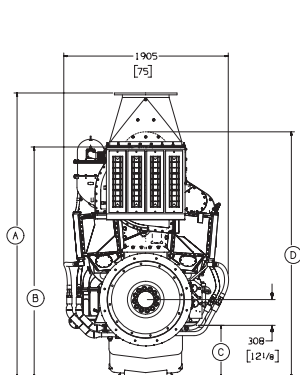


(shown with accessory rack, exhaust outlet adapter and EMD supplied air filter)

TECHNICAL DATA

Model	Cylinders	Rating	bkW	bhp	rpm	g/bkW-hr	U.S. g/h	EPA	IMO
8 E 23	8	CS	1491	2000	900	201	93	T3	II
12 E 23	12	CS	2237	3000	900	198	138	T3	II
16 E 23	16	CS	2983	4000	900	196	182	T3	II
20 E 23	20	CS	3729	5000	900	209	236	T3	II
8 E 23	8	INT	1641	2200	900	200	103	T3	II
12 E 23	12	INT	2461	3300	900	197	152	T3	II
16 E 23	16	INT	3281	4400	900	195	201	T3	II
20 E 23	20	INT	4101	5500	900	210	261	T3	II

Note: EMD E 23 engines were formerly EMD 710 Series. INT equals Intermittent Service Rating. CS equals Continuous Service Rating. 750 rpm (50 Hz) and dual fuel options are available. Contact local dealer for detail.



(shown with accessory rack)

E 23B

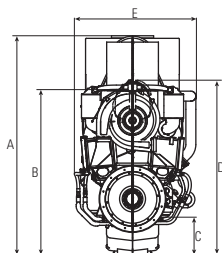
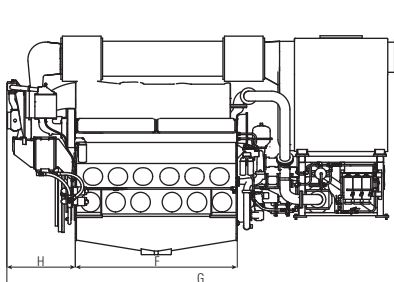
DIMENSIONS (mm) AND WEIGHTS (kg)

Type	A	B	C	D	E	F	G	H	Engine Weight	Acc. Rack Weight w/ SCR
8 E 23B	3533	2573	632	2790	1971	1864	6248	929	13018	5715
12 E 23B	3685	2764	632	2948	1971	2734	6580	1050	17690	5715
16 E 23B	3685	2764	632	2948	1971	3715	7657	1050	20865	5715

DIMENSIONS (in) AND WEIGHTS (lb)

Type	A	B	C	D	E	F	G	H	Engine Weight	Acc. Rack Weight w/ SCR
8 E 23B	145.1	101.3	24.88	116.1	77.6	73.4	246.0	36.58	28700	12599
12 E 23B	145.1	108.8	24.88	116.1	77.6	107.6	259.1	41.3	39000	12599
16 E 23B	145.1	108.8	24.88	116.1	77.6	146.3	301.5	41.3	45999	12999

Note: Completely Integrated System



TECHNICAL DATA

Model	Cylinders	Rating	bkW	bhp	rpm	EPA	IMO	EU
8 E 23B	8	CS	1491	2000	900	T4F	III	NC
12 E 23B	12	CS	2237	3000	900	T4F	III	NC
16 E 23B	16	CS	2983	4000	900	T4F	III	NC
20 E 23B*	20	CS	3729	5000	900	T4F	III	NC
8 E 23B	8	INT	1641	2200	900	T4F	III	NC
12 E 23B	12	INT	2461	3300	900	T4F	III	NC
16 E 23B	16	INT	3281	4400	900	T4F	III	NC
20 E 23B*	20	INT	4101	5500	900	T4F	III	NC

Note: INT equals Intermittent rating

* Contact your local dealer for details

E 23B Enhancements:

- U.S. EPA Tier 4 Final / IMO Tier III
- Completely integrated SCR System – no need to worry about mounting or where to place it in the engine room
- Closed Crankcase
- High pressure lube oil system
- Mechanical oil filtration with centrifuge
- Next generation Accessory Rack

Standard Equipment

- EMDEC/CAT ADEM Engine control module, including EUI injectors, wiring harness and sensors.
- Fuel pump, duplex spin-on primary filters/bypass, and manual priming pump.
- Single oil pump, cooler, strainer, centrifuge, self-cleaning filter, turbocharger primary and soakback filter
- Gear-driven HT and LT centrifugal coolant pumps and automatic thermostatic valves
- Single-stage scavenging air turbocharger with two (2) aftercoolers.
- Individual cylinder exhaust thermocouples and exhaust manifold thermal blankets (SOLAS)
- SCR Module, DEF dosing cabinet, DEF mixing tube, and flex connections
- Air start system

Options

- Marine society certifications
- Alarm & Protection panels and remote displays
- Power takeoff (free end).
- Main bearing thermocouples
- Vibration isolation mounts
- Torsional Vibration Analysis.
- Custom color finish paint (cement gray standard).
- Engine-driven sea water pump
- Oil mist detection
- Water expansion tanks (HT & LT)
- Close-coupled intake air filter

Rating Definitions and Conditions

Continuous Service Rating is suitable for continuous duty applications with no limit on operating hours at maximum load.

Intermittent Rating is suitable for continuous duty applications involving varying loads. Maximum engine power produced is limited by application guidelines, leaving a power reserve for intermittent operating conditions. Operating time at loads above the Continuous Service Rating is limited to one hour in 12 or 8% of total operating hours.

GLOSSARY



Emissions Standards

Global regulatory agencies, including U.S. Environmental Protection Agency (EPA), EURO Waterways and International Maritime Organization (IMO) have enacted programs to reduce emissions from all diesel vessels.

Caterpillar Marine has a key focus on emissions regulations to ensure that our marine engines meet global requirements. We've long been a leader in solving environmental challenges, allowing customers to focus on business progress.

U.S. EPA Standards

EPA applies for marine diesel engines installed in a variety of U.S. flagged vessels ranging in size and application from small recreational vessels to tugboats and large ocean-going vessels.

High Performance Applications:

EPA Tier 3: Cat[®] C7.1, C8.7, C9.3, C12.9, C18 & C32

Commercial Applications:

EPA Tier 3: Cat C1.5, C2.2, C4.4, C7.1, C9.3, C15, C18, C32
(< 600 kW)

MaK M 32 E, M 34 DF, M 43 C, M 46 DF
(category 3 > 30 Ltr.)

EPA Tier 4: Cat C32, 3500, C175, C280
(> 600 kW)

U.S. EPA Regulations

- NC** Not U.S. EPA Marine Certified for use in the U.S. or Canada.
- T3C** Meets U.S. EPA Marine Tier 3 Commercial standards.
- T3R** Meets U.S. EPA Marine Tier 3 Recreational standards.
- T3CR** Meets U.S. EPA Marine Tier 3 Commercial standards and U.S. EPA Marine Tier 3 Recreational standards.
- T4C** Meets U.S. EPA Marine Tier 4 Final Commercial standards.
- Emergency** Meets U.S. EPA Marine Tier 2 or Tier 3, as applicable, that otherwise must meet Tier 4 Final.

Canada Regulations

As of January 1, 2016 Category 2 engines (7 to 30 l/cylinder) on Canadian flagged vessels must meet U.S. EPA requirements or have an equivalent certificate that has been provided by another country. All other marine engines must meet IMO requirements for vessels constructed after December 31, 2010. Engines on vessels with keel laid in 2017 with combined propulsion power < 750 kW are exempt from IMO III.

IMO Certification

Tier	Date	NO _x Limit (g/kWh)		
		n < 130	130 ≤ n < 2000	n ≥ 2000
Tier I	2000	17.0	45 · n ^{-0.2}	9.8
Tier II	2011	14.4	44 · n ^{-0.23}	7.7
Tier III	2016*	3.4	9 · n ^{-0.2}	2.0

IMO Certification

IMO I — Meet IMO emissions standards for the year 2000 as defined by Regulation 13 of Annex VI to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the protocol of 1997. Applies to specific engines in vessels with a keel lay date from January 1, 2000 until December 31, 2010; other rules may apply.

IMO II — Emissions data measurement is consistent with the procedures described in the NO_x Technical Code 2008. The engine exhaust emissions meet the International Maritime Organization's Regulation 13 of Revised Annex VI to the MARPOL Convention. Applies to engines greater than 130 kW on vessels flagged in countries party to the MARPOL Annex VI Convention and the vessel is constructed after December 31, 2010. IMO II typically applies outside of NO_x Emissions Control Areas (NO_x ECA). See IMO.org "status of conventions" for a current list of nations enforcing MARPOL Annex VI. Other rules may apply.

IMO III — Emissions data measurement is consistent with the procedures described in the NO_x Technical Code 2008. The engine exhaust emissions meet the International Maritime Organization's Regulation 13 of Revised Annex VI to the MARPOL Convention. IMO III applies to NO_x Emission Control Areas (NO_x ECA) defined areas. Other rules may apply.

NST — Engines ≤ 130 kW are not subject to IMO regulations.

EU Certification

Commercial Craft Directive 97/68/EC (EU Stage IIIA)

This directive is in effect and applies to all propulsion and auxiliary engines. Caterpillar has certified some engines with a rated power of greater than 560 kW to this standard. Most of these are to be used for inland waterway vessels. These engines also became effective by reciprocity agreement with CCNR Stage II, on July 1, 2007. (97/68 directive was repealed January 1, 2017 although 97/68 (IIIA) standards apply to marine engines until Stage V came into effect January 1, 2019 for < 300 kW and January 1, 2020 for ≥ 300 kW and all references to 97/68 are now references to EU 2016/1628 (Stage V)).

Central Commission for Navigation on the Rhine

Commercial Craft — CCNR Stage II diesel engine emissions standards became effective July 1, 2007; this directive applies to engines with a rated power at or above 37 kW. The emissions standards of CCNR expire with the implementation of Stage V as noted above.

Engine Certification Descriptions

CC2 Meets CCNR Stage II

IW Meets EU Stage IIIA or referred to as, Inland Waterway Commercial Craft Directive, meaning the same as Commercial Craft Directive 97/68/EC, now EU 2016/1628 (EU Stage IIIA). Some engine models and ratings will have (CCNR) or (EU Stage IIIA).

NC Not Certified for specific regulations.

NST Engines ≤ 19 kW are not subject to CCNR legislation.

RCD Recreational Craft Directive, meets 2013/53/EU.

This directive is in effect and applies to all recreational engines used in the European Union areas.

EUV Engines meeting Stage V.

C-I/II Engines meeting China inland water regulations.

Marine Rating Definition

Propulsion Engines

Rating definitions provide guidelines to help determine the appropriate rating for specific applications based on vessel operation. Cat marine propulsion engine rating applications for C9 through C175-16 are based on load factor, time at full throttle, and operational hours per year.

Contact your local Cat dealer for assistance in determining the appropriate rating for your specific application.

A Rating (Unrestricted Continuous)

Typical applications: For vessels operating at rated load and rated speed up to 100% of the time without interruption or load cycling (80% to 100% load factor).

Typical operation ranges from 5000 to 8000 hours per year.

For C280-6, C280-8, C280-12 and C280-16

Engines Only:

Continuous Service (CS) Rating is suitable for continuous duty applications, including dredges, for operation without interruption or load cycling.

B Rating (Heavy Duty)

Typical applications: For vessels operating at rated load and rated speed up to 80% of the time with some load cycling (40% to 80% load factor).

Typical operation ranges from 3000 to 5000 hours per year.

C Rating (Maximum Continuous)

Typical applications: For vessels operating at rated load and rated speed up to 50% of the time with cyclical load and speed (20% to 80% load factor).

Typical operation ranges from 2000 to 4000 hours per year.

For C280-6, C280-8, C280-12, C280-16, and EMD E 23 Engines Only:

Maximum Continuous (MC) Rating or EMD Intermittent rating is generally used for vessel applications involving varying loads. The engine power actually produced is limited by application guidelines, leaving a power reserve for unusual operating conditions. Operating time at loads above the Continuous Service Rating for a given rpm is limited to one hour in 12 or 8.3% of total operating hours.

FCVR – Fast Commercial Vessel Rating: 85% of operating hours at rated speed, 15% of hours at less than 50% rated power. TBO approximately 20,000 - 25,000 hours. The propulsion system design should consider heavy ship condition, sea state, hull fouling and propulsion system power losses for proper match between engine and prop/jet.

D Rating (Intermittent Duty)

Typical applications: For vessels operating at rated load and rated speed up to 16% of the time (up to 50% load factor). Typical operating ranges from 1000 to 3000 hours per year.

E Rating (High Performance)

Typical applications: For vessels operating at rated load and rated speed up to 8% of the time (up to 30% load factor). Typical operation ranges from 250 to 1000 hours per year.

DEP Ratings (Diesel Electric Propulsion, Electric Drive)

Typical applications: For vessels operating with generator sets that provide power to the propulsion systems. All ratings are Prime Ratings according to ISO 8528-1 for unlimited usage per year at a load factor of $\leq 70\%$. 10% overload capability is required for a maximum of 1 hour out of every 12 and a maximum of 25 hours total per year.

Typical applications could include but are not limited to supply vessels, cruise vessels, research vessels, or any other ship using diesel electric drive systems.

Rating Conditions for C175 and Smaller Engines

Ratings are based on SAE J1228 standard conditions of 29.61 in Hg (100 kPa) and 77°F (25°C). These ratings also apply at ISO3046-1:2002E, ISO8665, DIN6271-3, and BS5514 conditions of 29.61 in Hg (100 kPa), 81°F (27°C) and 60% relative humidity.

Caterpillar maintains ISO9001:2000 certified quality management systems for engine test facilities to assure accurate calibration of test equipment. Electronically controlled engines are set at the factory at the advertised power corrected to standard ambient conditions. The published fuel consumption rates are in accordance with ISO3046-1:2002E.

Fuel consumption is based on SAE J1995 with +/- 3% tolerance at rated power for fuel having an LHV of 18,390 Btu/lb (42,780 kJ/kg) when used at 84.2°F (29°C) and weighing 7.001 lbs/U.S. gal (838.9 g/liter). Additional ratings may be available for specific customer requirements. Consult your Cat representative for details.

Rating Conditions for C280 Engines

Ratings are based on SAE J1349 standard conditions of 29.61 in Hg (100 kPa) and 77°F (25°C). These ratings also apply at ISO3046-1:2002E, ISO8665, DIN6271-3, and BS5514 standard reference conditions. Ratings also meet classification society maximum temperature requirements of 113°F (45°C) temperature to turbo and 90°F (32°C) seawater temperature without derate.

Fuel consumption is based on ISO3046/1 with +5% tolerance at rated power for fuel having an LHV of 18,390 Btu/lb (42,780 kJ/kg) and weighing 7.001 lbs/U.S. gal (838.9 g/liter). Includes engine mounted fresh water and lube oil pumps. BSFC without pumps, 2% less. Additional ratings may be available for specific customer requirements. Consult your Cat representative for details.

Performance Data

Performance along a typical fixed pitch propeller curve with a 3.0 exponent.

Power rated in accordance with NMMA procedure as crankshaft power. For units equipped with Caterpillar supplied marine gears, reduce crankshaft power by 3% for propeller shaft power.

Marine Rating Definition Generator Sets and Auxiliary Engines

Caterpillar has offered packaged power systems for over 70 years. We assure power and performance ratings, as advertised, through extensive factory testing.

Cat generator sets typically exceed NEMA and IEEE standards for load acceptance. All rotor designs have been type tested at 150% overspeed for two hours at 338°F (170°C) ambient temperature.

Rating Definition

All Cat marine auxiliary engines and generator sets are rated for prime power for continuous electric service according to ISO 8528-1.

Hours per Year	Unlimited
Load Factor	< 70%
Overload Capacity	+ 10%
	maximum of 1 hour in 12
	maximum of 25 hours per year

Rating Conditions

Ratings are based on SAE J3046 and J1349 standard conditions of 29.61 in. Hg (100 kPa) and 77°F (25°C). These ratings also apply at ISO8665, ISO3046-1:2002E, DIN6271-3, and BS5514 standard conditions of 29.61 in. Hg (100 kPa), 81°F (27°C), and 60% relative humidity.

Fuel rates are based on fuel oil of 35° API [60°F (16°C)] gravity having an LHV of 18,390 Btu/lb (42 780 kJ/kg) when used at 85°F (29°C) and weighing 7.001 lbs/U.S. gal. (838.9 g/liter).

Marine Auxiliary Engines are mainly used as generator set engines; however, they can be used for electrically driven pumps, winches, conveyors, thrusters, when it is specified. Engines can be radiator cooled or heat exchanger/keel cooled.

Abbreviations

bhp	Brake Horsepower	LG	Length of Engine with Gear/Generator
bkW	Brake Kilowatts	MCS	Marine Control System
CEM	Clean Emission Module	mhp	Metric Horsepower
DIN	German Standards Organization	NA	Naturally Aspirated
DF	Dual Fuel	R	Radiator Cooled
ekW	Electrical Kilowatts	SAE	Society of Automotive Engineers
EPA	Environmental Protection Agency	SCAC	Separate Circuit Aftercooled
EU	European Union	SCR	Selective Catalytic Reduction
EUI	Electronic Unit Injection	T	Turbocharged
g/bkW-hr	Grams per Brake Kilowatt Hour	TA	Turbocharged, Aftercooled
H	Height of Engine	TSA	Turbocharged, Supercharged, Aftercooled
HE	Heat Exchanger Cooled	TTA	Twin Turbo Aftercooled
IMO	International Maritime Organization	U.S. g/h	U.S. Gallons per Hour
ISO	International Standards Organization	W	Overall Width
kVA	Kilovolt-Ampere	WE	Width of Engine
L	Overall Engine Length		
LE	Length of Engine from Front of Engine to Rear Face of Flywheel Housing		

Caterpillar Marine

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Caterpillar Marine Asia Pacific Pte Ltd

No. 5 Tukang Innovation Grove
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Republic of Singapore

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For more information
please visit:
www.cat.com/marine

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