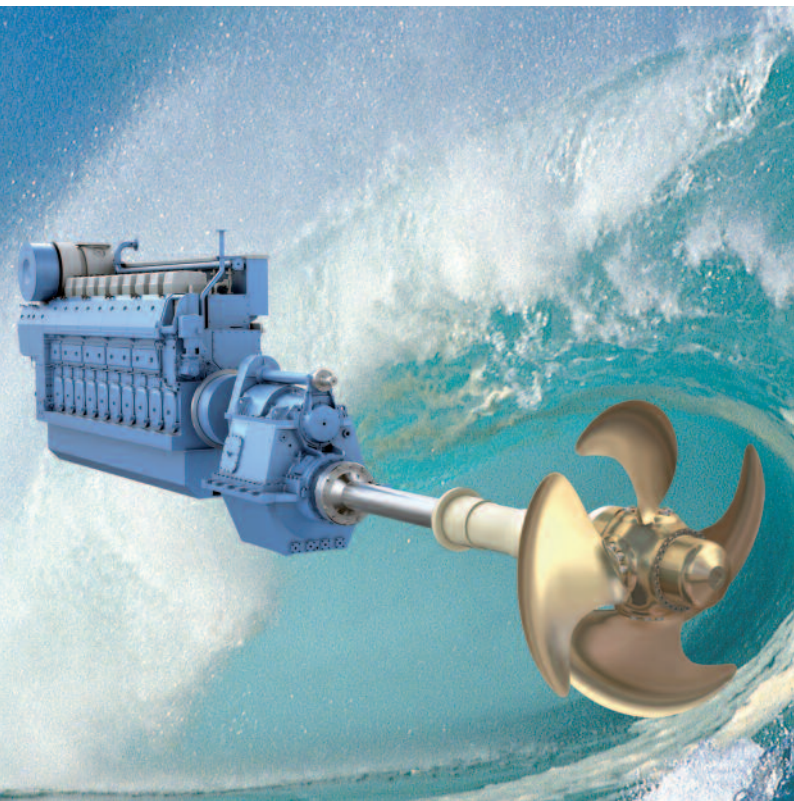




Rolls-Royce

Marine engine and propulsion programme 2012



For over 100 years of operation
Rolls-Royce has delivered more
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land based applications worldwide.

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for industrial and land-based municipal applications.

For the marine market Rolls-Royce can offer the Bergen C25:33L, B32:40L, and the B32:40V engines. These models come as 6, 8, 9, 12 and 16 cylinder engines, with power outputs from 1920kW up to 8000kW operating on Marine Diesel Oil or Heavy Fuel Oil.

In addition we offer gas engines for marine mechanical or gas-electric drive. Engine platforms are the Bergen C26:33L, B35:40L and B35:40V, with power outputs from 1460kW to 7700kW.

Our range of engines can also be supplied as part of a complete propulsion system utilising Rolls-Royce products including propellers, Azimuth thrusters and Tunnel thrusters.



Rolls-Royce also ensures extensive long term service agreements benefitting all marine and land-based applications. To support the high reliability required of such installations, the Bergen office runs an efficient service organisation with the highest possible availability of spare parts from stock.

Highly qualified service engineers are available 24 hours a day every day of the year. Our network also provides customers with the expertise of more than 40 sales and service centres around the world.

A unique combination of high-quality performance, reliability and cost-effective operation has always thrived at the heart of Rolls-Royce applications.

All the time we have stayed true to our philosophy: high power, low fuel consumption,

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Fax +45 99 30 36 01

Finland

Rolls-Royce Oy Ab
Itämerenkatu 5
FI-00180 Helsinki
Tel +358 9686 6330
Fax +358 9686 63339

Germany

Rolls-Royce Marine Deutschland GmbH
Fährstieg 9
D-21107 Hamburg
Germany
Tel +49 40 78 09 19 0
Fax +49 40 78 09 19 19

Rolls-Royce Interling Products
(Interling GmbH)
Fährstieg 9
D-21107 Hamburg
Germany
Tel +49 40 52 87 36 0
Fax +49 40 52 87 36 66

The Netherlands

Rolls-Royce Marine Benelux b.v
Werfdijk 2 (Port 2828)
3195 HV Pernis, Rotterdam
Tel +31 10 40 90 920
Fax +31 10 40 90 921

Norway

Rolls-Royce Marine AS, Engines – Bergen
PO Box 924, N-5808 Bergen, Norway
Tel +47 81 52 00 70
Fax +47 55 53 61 04

Sweden

Rolls-Royce AB
PO Box 1010
S-68129 Kristinehamn
Tel +46 55 08 40 00
Fax +46 55 01 81 90

United Kingdom

Rolls-Royce Power Engineering plc
Emerald Court, Pilgrim Centre
Brickhill Drive, Bedford MK41 7PZ
Tel +44 (0)1332 242424
Fax +44 (0)1234 21 1074

Southern Europe

France

Rolls-Royce Marine France
4, Place des Etats
Silic 261, 94578 Rungis Cedex
Tel +33 1468 62811
Fax +33 1468 79398

Greece

Rolls-Royce Marine Hellas A.E.
Akti Miaouli & 2 Kantharou Str.
GR 185 37 Piraeus, Greece
Tel +30 210 4599 688
Fax +30 210 4599 687

Italy

Rolls-Royce Marine
Via Castel Morrone, 13
16161 Genova
Tel +39 010 749 391
Fax +39 010 749 3950

Poland

Rolls-Royce Marine Poland sp. z o.o.
ul. Kopernika 1
PO-83-140 Gniew, Poland
Tel +48 58 535 2271
Fax +48 58 535 2218

Spain

Rolls-Royce Marine España SA
Manuel Tovar, 36, 2A
28034 Madrid
Tel +34 91 358 5319
Fax +34 91 358 5704

Turkey

Rolls-Royce Marine Turkey
Palladium Alisveris Merkezi ve Residence
Barbaros Mah.Halk Cad.No:6 Kat:2
34746 Kozyatagi, Istanbul, Turkey
Tel: +90 (0)216 663 61 10
Fax: +90 (0)216 663 61 00

Middle East

United Arab Emirates

Rolls-Royce Marine Middle East
Jebel Ali Free Zone, UA 03-RA 08, Dubai
Tel +971 4 883 3881
Fax +971 4 883 3882

Asia Pacific

Australia

Rolls-Royce Marine Australia Pty Ltd
Unit 4, Lorimer Street
Port Melbourne VIC 3207, Australia
Tel +61 3 9644 4700
Fax +61 3 9646 1777

China

Rolls-Royce Marine Hong Kong Ltd
Rm 4103, 41/F, Hopewell Centre
183 Queen's Road East
Wanchai, Hong Kong
Tel +85 22 526 6937
Fax +85 22 868 5344

Rolls-Royce Marine Shanghai Limited
No. 1 Xuan Zhong Road – Nan Hui
Industrial Zone, 201300 Shanghai, China
Tel +86 21 5818 8899
Fax +86 21 5818 2625

Rolls-Royce Marine Dalian
Rm.1204-1206, Swissotel, 21 Wu Hui Road,
Zhongshan District, 116001 Dalian, China
Tel +86 411 8230 5198
Fax +86 411 8230 8448

India

Rolls-Royce Marine India Pvt Ltd
103 Windsor, Kalina, Santacruz East
Mumbai-400059
Tel +91 22 6440 3838
Fax +91 22 6440 3818

Japan

Rolls-Royce Marine Japan K K
Tobunsha Bld 4F, 2-5-1 Kudan Minamai
Chiyoda-Ku, Tokyo 102-0074
Tel +81 33 237 6861
Fax +81 33 237 6846

New Zealand

Rolls-Royce Marine New Zealand
116 Buchan Street, Sydenham
8002 Christchurch, New Zealand
Tel +64 3 962 1230
Fax +64 3 962 1231

Republic of Korea

Rolls-Royce Marine Korea Ltd
Noksan State Industrial Complex 18B-2L
1578-1, Songjeong-dong,
Gang Seo-gu 618-270 Busan
Tel +82 51 831 4100
Fax +82 51 831 4101

Russia

Rolls-Royce Marine East Russia
5F, 3b Streinikova, 690065 Vladivostok
Tel +7 4232 495 484
Fax +7 4232 495 484

Rolls-Royce Marine St. Petersburg
Business Center 'B5'
Pr. Bakunina 5, Office 304
191024 St. Petersburg
Tel: +7 8123 321 855
Fax: +7 8123 321 855

Singapore

Rolls-Royce Marine Singapore Pte Ltd
No 6 Tuas Drive 1 Jurong 2263
638673 Singapore
Tel +65 6 862 1901
Fax +65 6 863 2165

Americas

Brazil

Rolls-Royce Marine Brasila Ltda
Ilha do Cajú, 131
Ponta D'Areia – Niterói – RJ
24040-005
Tel +55 21 3860 8787
Fax +55 21 3860 4410
Mobile +55 21 8136 3315

Canada

Rolls-Royce Canada Ltd
96 North Bend Street
Coquitlam BC, V3K 6H1 Vancouver
Tel +1 604 942 1100
Fax +1 604 942 1125
196 Joseph Zatzman Drive, Unit 9
Dartmouth, Nova Scotia B3B 1N4
Tel +1 902 468 2883
Fax +1 902 468 2759
1076 Topsail Road, Mount Pearl
St Johns A1N 5E7 Newfoundland
Tel +1 709 364 3053
Fax +1 709 364 3054

Chile

Rolls-Royce Marine Chile SA
Alcántara 200, piso 6
Las Condes
Santiago
7550159 Chile
Tel +56 2 369 5656
Fax +56 2 369 5657

USA

Rolls-Royce Commercial Marine Inc
8 Renmar Way, Walpole, MA 02081
Tel +1 508 660 6207
Fax +1 508 660 6176

11550 Interchange Circle North
Miramar, Florida 33025
Tel +1 954 436 7100
Fax +1 954 436 7101

1880 South Dairy Ashford, Suite 301
Houston, TX 77077
Tel +1 281 902 3300
Fax +1 281 902 3301

Rolls-Royce Commercial Marine-Galveston
c/o Gulf Copper Drydock and Rig Repair
Pelican Island #12
2920 Todd Road, Texas
Tel +1 832 330 2501
Fax +1 409 941 6302

200 James Drive West, St Rose
New Orleans, LA 70087
Tel +1 504 464 4561
Fax +1 504 464 4565

4451 14th Avenue NW
Seattle, WA 98107
Tel +1 206 782 9190
Fax +1 206 782 0176

General conditions for Marine engines

Marine liquid fuel engine

Ratings are according to ISO 3046-1, at maximum 45°C ambient air temperature and maximum 32°C sea water temperature. Specific fuel oil consumption is based on MDO with a net calorific value of 42,7 MJ/kg and no engine driven pumps. For each engine driven pump, there is a need to add 0,5%.

Emissions

The marine diesel engines comply with the requirements of the IMO Tier II without any external cleaning system. IMO Tier III is met by the use of a Selective Catalytic Reactor (SCR) system.

The marine gas engines comply with IMO Tier III with no need for a SCR system.

Heavy fuel oil operation

The engines are designed for operation on heavy fuel oil with viscosity up to 700 cSt at 50°C ISO 8217 RMK77. Ratings will be specified subject to type of application.

Marine gas engine

The marine gas engines give the following reductions in emissions compared with diesels IMO Tier II: 92% NO_x, net 22% greenhouse gases and close to zero SO_x and particulate matter. Marine gas engine ratings are according to ISO 3046-1, at maximum 45°C ambient air temperature and maximum 32°C sea water temperature. Specific fuel gas consumption excluding engine driven pumps is based on reference natural gas with Methane number above 70 and net calorific value of 36 MJ/nm³. If there are engine driven pumps, add 0,5% for each pump. Gas feed temperature is 20-40°C. Minimum gas feed pressure to Gas Regulating Unit to be 4,5 barg.

Dimensions

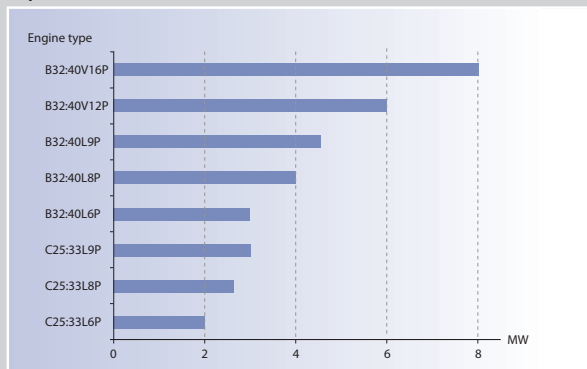
All dimensions are in mm. Dimensions and weights are given for guidance purposes only and are based on a typical specification. For detailed information please contact Rolls-Royce Marine AS.

Note

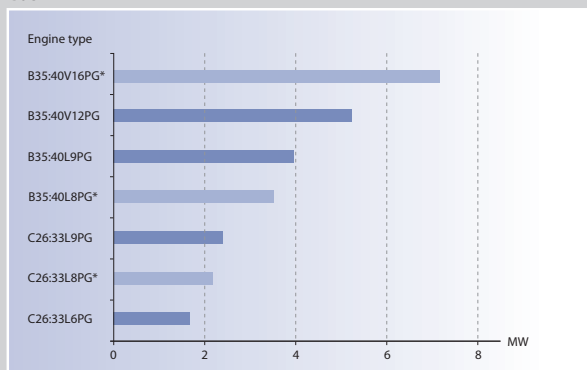
Due to continuous development, some data may change without notice.

Marine engine product range

Liquid fuel



Gas

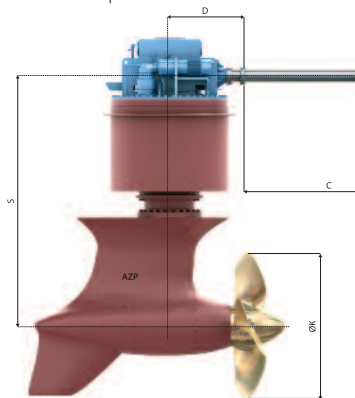


* In progress - release date to be announced at later stage

Propulsion Systems

Bergen B32:40L – AZIPULL

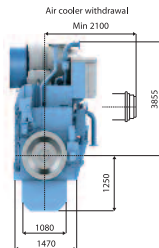
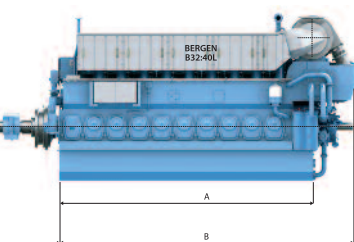
Typical parameters for AT applications with 17 knots speed
(max. speed for AZIPULL – 24 knots)



Diesel Engine Technical Data					Azimuth Thruster Technical Data		
Engine type	Engine mass	Engine power	Cyl No.	Engine speed	Azimuth type and size	Azimuth mass*	Min. Prop. Speed
	kg	kW		rpm		kg	rpm
B32:40L6P	33200	2880	6	720	AZP120	45000	172
B32:40L8P	40000	3840	8	720	AZP150	85000	133
B32:40L9P	45900	4320	9	720	AZP150	85000	159
B32:40L6P	33200	3000	6	750	AZP120	45000	172
B32:40L8P	40000	4000	8	750	AZP150	85000	139
B32:40L9P	45900	4500	9	750	AZP150	85000	153

Additional notes (*):

- Mass of azimuth unit is based on minimum stem length (S)
- Minimum stem length (S) can be increased in step of 200 mm for AZP100, 250 mm for AZP120 and 300 mm for AZP150
- Length (C) and type of intermediate shaft can vary from short straight shafts to long cardan shafts



Main Dimensions

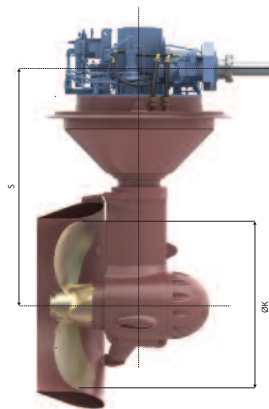
A Sump length mm	B Engine length mm	C Interm. Shaft* mm	D Input shaft mm	K Max. Prop. Dia mm	S Min. Stem length* mm
4390	5383		1750	3300	4590
5430	6422		2295	4200	5795
5950	6942		2295	3900	5795
4390	5383		1750	3300	4590
5430	6422		2295	4200	5795
5950	6942		2295	4000	5795

Note: The table shows typical data for Rolls-Royce twin screw propulsion systems for free running ships. The azimuth unit data are given without ice class based on standard gear ratios. The data is not binding and may change without notice

Propulsion Systems

Bergen B32:40L6P – Rolls-Royce Azimuth Thruster

Typical parameters for Harbour Tugs with speed up to 16 knots



Diesel Engine Technical Data					Main Dimensions		Azimuth type and size
Engine type	Engine mass kg	Engine power kW	Cyl No.	Engine speed rpm	A Sump length mm	B Engine length mm	
B32:40L6P	33200	3000	6	750	4390	5383	Ducted FP / CP US305P40

Dimensions

K Propeller diameter

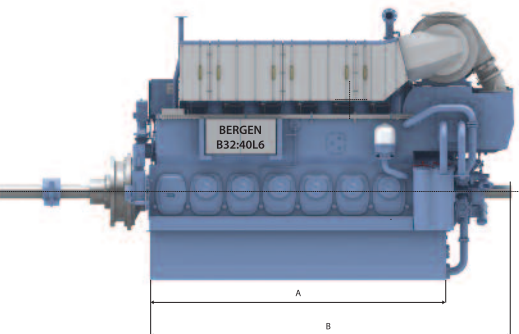
S Nominal stern length

Construction

FP Fixed Pitch Propeller

CP Controllable Pitch Propeller

Ducted with TK-nozzle.



	Azimuth Thruster Technical Data			Main Dimensions	
				K	S
Azimuth mass* kg	Max. input power (kW) Harbour tugs Other vessels		Bollard pull*** tons	Prop. Dia. FP / CP mm	Nominal Stem length* mm
43000	3200	3000	108	3200	4200

* Dry weight in metric tons of weld-in installation FP / CP propeller

** The power figures on table are for ship assisting harbour tugs driven by diesel engine.

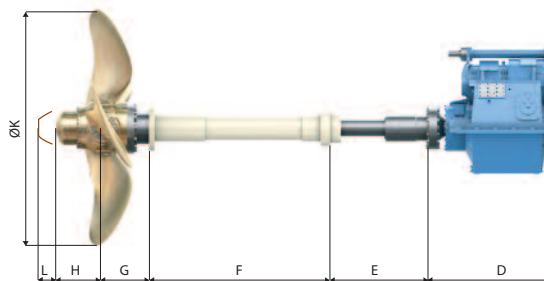
The actual power figures are defined acc. to the application, prime mover, classification etc

***Estimated metric tons per two (2) units with installed engine power.

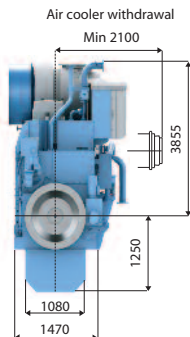
All data is subject to change without prior notice.

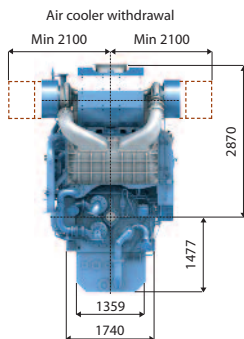
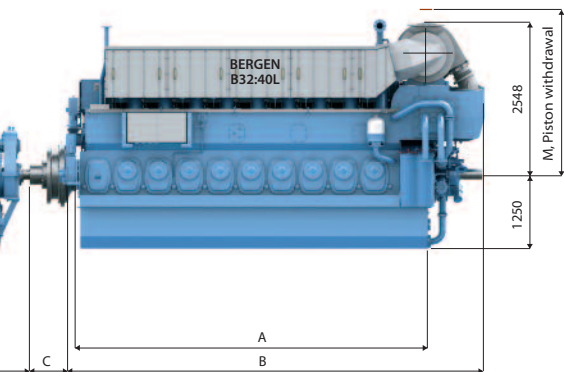
Propulsion Systems

Engine B32:40L



L, dismantling space for
hub cylinder





Engine B32:40L

Typical parameters for single screw cargo vessel with speed up to 17 knots

Engine type	Engine Power kW	Cly No.	Engine speed rpm	Gear size	Min prop. speed rpm	K Prop dia mm	Hub size cm	A mm
B32:40L6P	2880	6	720	750	130	4100	86A/4I	4390
B32:40L6P	2880	6	720	1500	121	4300	94A/4I	4390
B32:40L6P	3000	6	750	750	135	4100	86A/4I	4390
B32:40L6P	3000	6	750	1500	126	4200	94A/4I	4390
B32:40L8P	3840	8	720	750	154	4100	94A/4I	5430
B32:40L8P	3840	8	720	1500	140	4300	94A/4I	5430
B32:40L8P	3840	8	720	950	115	4700	102A/4I	5430
B32:40L8P	3840	8	720	3000	121	4600	102A/4I	5430
B32:40L8P	3840	8	720	3000-2T	87	5500	111A/4I	5430
B32:40L8P	4000	8	750	750	179	3700	86A/4I	5430
B32:40L8P	4000	8	750	1500	153	4100	94A/4I	5430
B32:40L8P	4000	8	750	950	120	4700	102A/4I	5430
B32:40L8P	4000	8	750	3000	126	4500	102A/4I	5430
B32:40L8P	4000	8	750	3000-2T	90	5400	111A/4I	5430
B32:40L9P	4320	9	720	1500	149	4200	94A/4I	5950
B32:40L9P	4320	9	720	950	115	4800	102A/4I	5950
B32:40L9P	4320	9	720	3000	121	4700	102A/4I	5950
B32:40L9P	4320	9	720	3000-2T	98	5300	111A/4I	5950
B32:40L9P	4500	9	750	1500	155	4200	94A/4I	5950
B32:40L9P	4500	9	750	950	120	4800	102A/4I	5950
B32:40L9P	4500	9	750	3000	126	4700	102A/4I	5950
B32:40L9P	4500	9	750	3000-2T	102	5200	111A/4I	5950
B32:40V12P	5765	12	720	950	115	5200	121A/4I	4951
B32:40V12P	5765	12	720	3000	129	4900	111A/4I	4951
B32:40V12P	6000	12	750	950	120	5100	111A/4I	4951
B32:40V12P	6000	12	750	3000	135	4800	111A/4I	4951
B32:40V16P	7680	16	720	950	138	4900	111A/4I	6200
B32:40V16P	7680	16	720	4500	133	5100	121A/4I	6200
B32:40V16P	8000	16	750	950	144	4800	111A/4I	6200
B32:40V16P	8000	16	750	4500	140	4900	121A/4I	6200
B32:40V16P	8000	16	750	6000	130	5200	121A/4I	6200

G, is project specific. Dimension shown is based on standard sealing length

F, Stern tube length is project specific dimension, 2500mm in this example

E, is project specific but a minimum service space is required

C, Length of elastic coupling is project specific

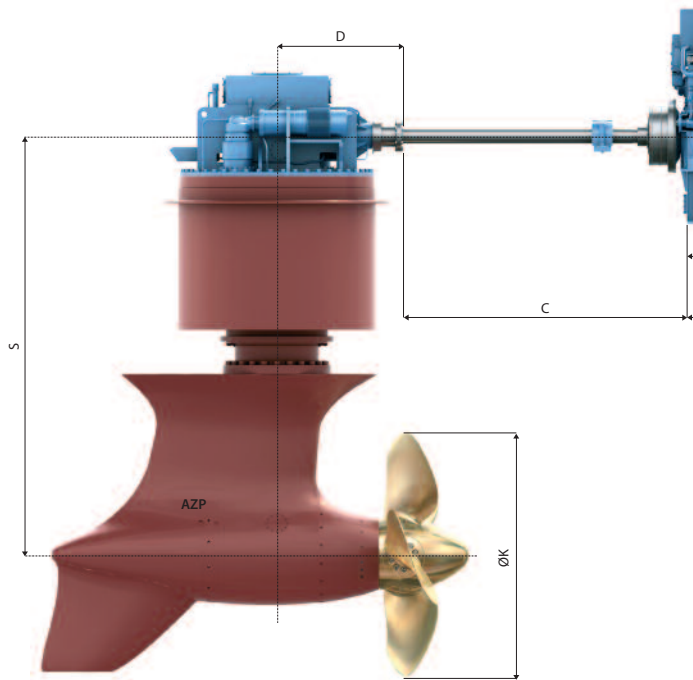
Prop mass * is based on 5m propeller shaft

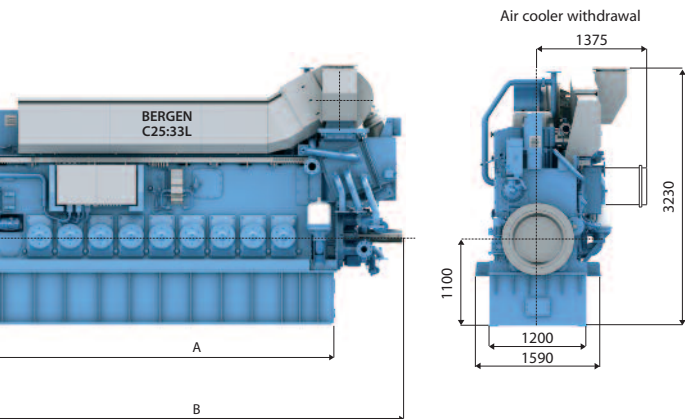
B mm	D mm	E mm	G mm	H mm	L mm	Gear mass kg	Prop mass* kg	Engine mass kg
5383	2020	1650	681	737	253	10200	9000	33200
5383	2353	1700	707	792	263	11500	10400	33200
5383	2020	1650	681	737	253	10200	9100	33200
5383	2353	1700	707	792	263	11500	10200	33200
6422	2020	1700	707	792	263	10200	10600	40000
6422	2353	1800	707	792	263	11500	11200	40000
6422	2775	1900	775	859	285	26250	13200	40000
6422	2710	1900	775	859	285	16500	13000	40000
6422	2820	1950	826	936	314	19000	16800	40000
6422	2020	1650	681	737	253	10200	9100	40000
6422	2353	1800	707	792	263	11500	11000	40000
6422	2775	1900	775	859	285	26250	13400	40000
6422	2710	1900	775	859	285	16500	13000	40000
6422	2820	1950	826	936	314	19000	16600	40000
6942	2353	1800	707	792	263	11500	11600	45900
6942	2775	1900	775	859	285	26250	14000	45900
6942	2710	1900	775	859	285	16500	13800	45900
6942	2820	1950	826	936	314	19000	16800	45900
6942	2353	1800	707	792	263	11500	11600	45900
6942	2775	1900	775	859	330	26250	14000	45900
6942	2710	1900	775	859	285	16500	13800	45900
6942	2820	1950	826	936	314	19000	16600	45900
6286	2775	1950	885	1020	345	26250	19800	53700
6286	2710	1950	826	936	314	16500	16800	53700
6286	2775	1950	831	936	314	26250	18200	53700
6286	2710	1950	826	936	314	16500	16800	53700
7870	2775	2000	831	936	314	26250	19200	62900
7870	2950	2000	885	1020	345	25000	21600	62900
7870	2775	2000	831	936	314	26250	19200	62900
7870	2950	2000	885	1020	345	25000	21200	62900
7870	2985	2050	910	1020	345	33000	22400	62900

Note: The table shows typical data for Rolls-Royce twin screw propulsion systems for free running ships. The azimuth unit data are given without ice class based on standard gear ratios. The data is not binding and may change without notice

Propulsion Systems

Bergen C25:33L – AZIPULL





Bergen C25:33L – AZIPULL

Typical parameters for AT applications with 17 knots speed
(max. speed for AZIPULL – 24 knots)

Diesel Engine Technical Data					Azimuth Thruster Technical Data		
Engine type	Engine mass	Engine power	Cyl No.	Engine speed rpm	Azimuth type and size	Azimuth mass*	Min. Prop. Speed
	kg	kW				kg	rpm
C25:33L6P	17500	1920	6	900	AZP100	30500	188
C25:33L8P	20700	2560	8	900	AZP100	30500	237
C25:33L8P	20700	2560	8	900	AZP120	45000	174
C25:33L9P	23900	2880	9	900	AZP100	30500	248
C25:33L9P	23900	2880	9	900	AZP120	45000	174
C25:33L6P	17500	2000	6	1000	AZP100	30500	175
C25:33L8P	20700	2665	8	1000	AZP100	30500	229
C25:33L8P	20700	2665	8	1000	AZP120	45000	167
C25:33L9P	23900	3000	9	1000	AZP120	45000	167

Additional notes (*):

- Mass of azimuth unit is based on minimum stem length (S)
- Minimum stem length (S) can be increased in step of 200 mm for AZP100, 250 mm for AZP120 and 300 mm for AZP150
- Length (C) and type of intermediate shaft can vary from short straight shafts to long cardan shafts

Main Dimensions

A Sump length mm	B Engine length mm	C Interm. Shaft* mm	D Input shaft mm	K Max. Prop. mm	S Min. Stem length* mm
3170	4036		1490	2800	4520
3930	4796		1490	2600	4520
3930	4796		1750	3300	4590
4310	5176		1490	2600	4520
4310	5176		1750	3300	4590
3170	4036		1490	2800	4520
3930	4796		1490	2800	4520
3930	4796		1750	3300	4590
4310	5176		1750	3300	4590

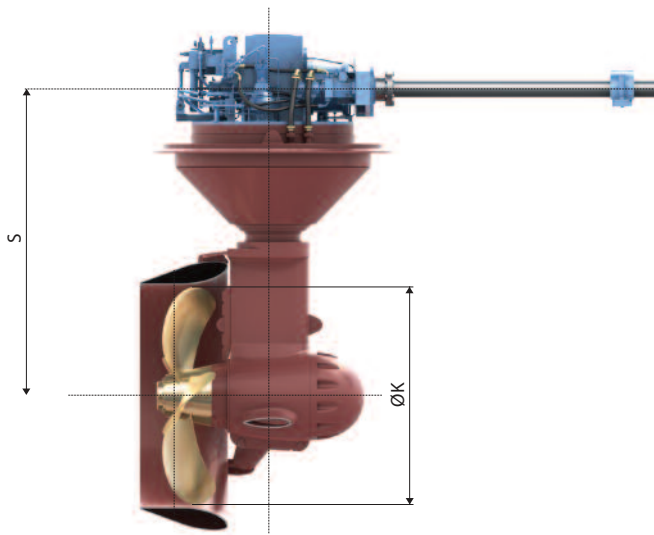
Note: The table shows typical data for Rolls-Royce twin screw propulsion systems for free running ships. The azimuth unit data are given without ice class based on standard gear ratios. The data is not binding and may change without notice

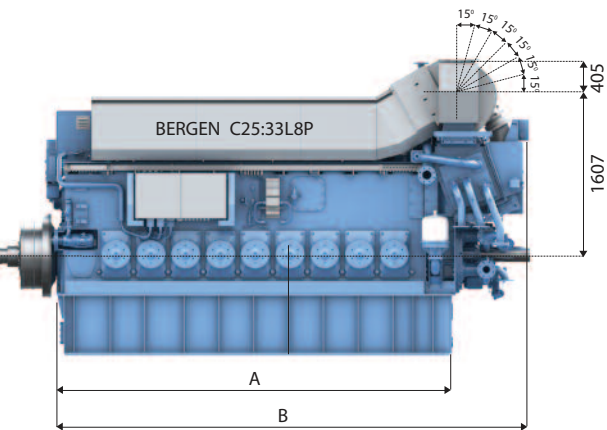


Propulsion Systems

Bergen C25:33L – Rolls-Royce Azimuth Thruster

Typical parameters for Harbour Tugs with speed up to 16 knots





Bergen C25:33L – Rolls-Royce Azimuth Thruster

Typical parameters for Harbour Tugs with speed up to 16 knots

Diesel Engine Technical Data					Main Dimensions		
Engine type	Engine mass kg	Engine power kW	Cyl No.	Engine speed rpm	A	B	Azimuth type and size
					Sump length mm	Engine length mm	
							Ducted FP / CP
C25:33L6P	18000	2000	6	1000	3170	4036	US 25
C25:33L6P	18000	2000	6	1000	3170	4036	US 25
C25:33L6P	18000	1920	6	900	3170	4036	US 25
C25:33L6P	18000	2000	6	1000	3170	4036	US 25
C25:33L8P	21000	2560	8	900	3930	4796	US 35
C25:33L8P	21000	2665	8	1000	3930	4796	US 35
C25:33L9P	24000	2880	9	900	4310	5176	US305 P40
C25:33L9P	24000	3000	9	1000	4310	5176	US305 P40

Dimensions**K** Propeller diameter**S** Stem length**Construction****FP** Fixed Pitch Propeller**CP** Controllable Pitch Propeller**Ducted** with TK-nozzle**Open** without nozzle.

Azimuth Thrust Technical Data			Main Dimensions	
Azimuth mass* kg	Input power Azimuth (kW)	Bollard pull*** tons	K	S
			Prop. Dia. FP / CP mm	Min Stem length* mm
Ducted FP / CP				
29000	2000	69	2600	3800
29000	2000	69	2600	3800
29000	1920	67	2600	3800
29000	2000	69	2600	3800
37500	2560	90	3000	3650
37500	2665	92	3000	3650
41000	2880	97	3000	4100
43000	3000	104	3200	4200

* Dry weight in metric tons of weld-in installation FP / CP propeller

** The power figures on table are for ship assisting harbour tugs driven by diesel engine.

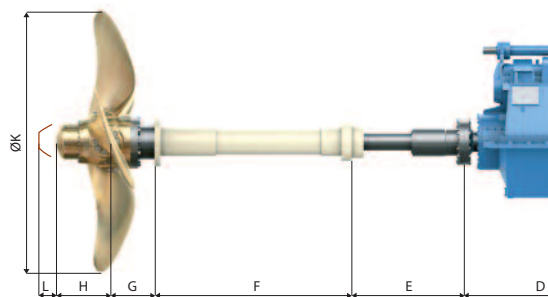
The actual power figures are defined acc. to the application, prime mover, classification etc

***Estimated metric tons per two (2) units.

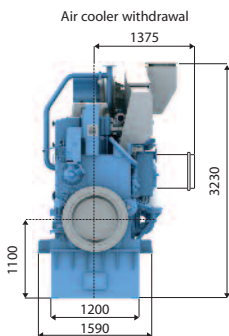
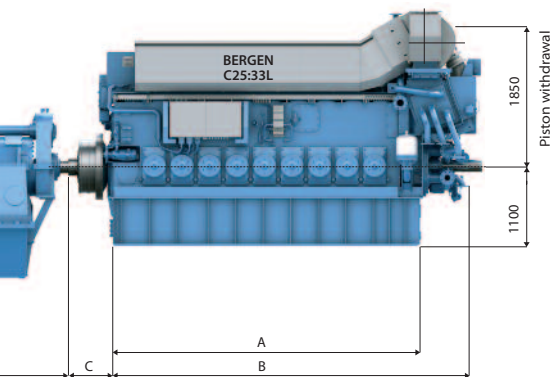
All data is subject to change without prior notice.

Propulsion Systems

Engine C25:33L



L, dismantling space for
hub cylinder



Engine C25:33L

Typical parameters for single screw cargo vessel with speed up to 17 knots

Engine type	Engine Power kW	Cly No.	Engine speed rpm	Gear size	Min prop. speed rpm	K Prop dia mm	Hub size cm	A mm
C25:33L6P	1920	6	900	480	210	2900	66A/4I	3170
C25:33L6P	2000	6	1000	480	222	2800	66A/4I	3170
C25:33L6P	1920	6	900	550	167	3300	72A/4I	3170
C25:33L6P	2000	6	1000	550	175	3200	72A/4I	3170
C25:33L6P	2000	6	1000	600	180	3200	72A/4I	3170
C25:33L8P	2560	8	900	550	195	3200	72A/4I	3930
C25:33L8P	2665	8	1000	550	208	3100	72A/4I	3930
C25:33L8P	2560	8	900	600	185	3300	72A/4I	3930
C25:33L8P	2665	8	1000	600	197	3200	72A/4I	3930
C25:33L8P	2560	8	900	750	145	3800	79A/4I	3930
C25:33L8P	2665	8	1000	750	160	3600	79A/4I	3930
C25:33L9P	2880	9	900	600	200	3300	72A/4I	4310
C25:33L9P	3000	9	1000	600	212	3200	79A/4I	4310
C25:33L9P	2880	9	900	750	145	3900	86A/4I	4310
C25:33L9P	3000	9	1000	750	160	3700	79A/4I	4310

G, is project specific. Dimension shown is based on standard sealing length

F, Stern tube length is project specific dimension, 2500mm in this example

E, is project specific but a minimum service space is required

C, Length of elastic coupling is project specific

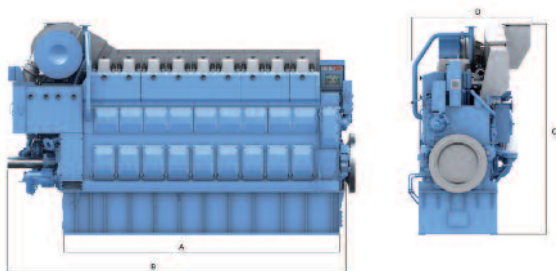
Prop mass * is based on 4m propeller shaft

B mm	D mm	E mm	G mm	H mm	L mm	Gear mass kg	Prop mass* kg	Engine mass kg
4036	1610	1550	565	566	211	3300	4300	17500
4036	1610	1550	565	566	211	3300	4250	17500
4036	1795	1550	601	671	217	5300	5300	17500
4036	1795	1550	601	671	217	5300	5200	17500
4036	1812	1550	601	671	217	5800	5100	17500
4796	1795	1550	601	671	217	5300	5700	20700
4796	1795	1550	601	671	217	5300	5600	20700
4796	1812	1550	601	671	217	5800	5700	20700
4796	1812	1550	601	671	217	5800	5700	20700
4796	2020	1600	640	677	237	10200	7100	20700
4796	2020	1600	640	677	237	10200	6900	20700
5176	1812	1600	601	671	217	5800	6100	23900
5176	1812	1550	640	677	237	5800	6300	23900
5176	2020	1650	681	737	253	10200	8100	23900
5176	2020	1650	640	677	237	10200	7400	23900)

Note: The table shows typical data for Rolls-Royce single screw propulsion systems for free running ships. The propulsion unit data are given without ice class based on standard gear ratios. The data is not binding and may change without notice

Propulsion engines – Liquid fuel

Bergen C25:33L



Principal dimensions:

Cylinder diameter 250 mm. Piston stroke 330 mm.

Engine type	A	B	C	D	Weight dry engine
C25:33L6P	3170	4036	3195	1775	19650 kg
C25:33L8P	3930	4796	3230	1873	23900 kg
C25:33L9P	4310	5176	3230	1873	26000 kg

Technical data

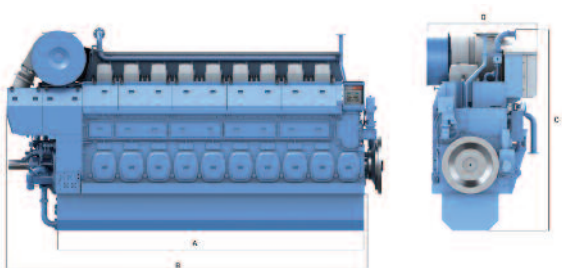
Engine type		C25:33L6P	C25:33L8P	C25:33L9P
Number of cylinders		6	8	9
Engine speed	r/min	900/1000*	900/1000*	900/1000*
Mean piston speed	m/s	10/11	10/11	10/11
Max. continuous rating (MCR)	kW	1920/2000	2560/2665	2880/3000
Max. continuous rating (MCR)	BHP (metric)	2610/2720	3480/3625	3915/4080
Mean effective pressure (BMEP)	bar	26.4/24.7	26.4/24.7	26.4/24.7
Specific fuel consumption	g/kWh	182/185	182/185	182/185
Specific lubricating oil consumption	g/kWh	0.7	0.7	0.7
Cooling water temp. engine outlet	°C	90	90	90

*MDO operations.

Dimensions given apply for rigidly mounted engines with wet sump. Dry sump can be supplied upon request. Front end P.T.O. can be delivered upon request.

Propulsion engines – Liquid fuel

Bergen B32:40L



Propulsion – Liquid fuel

Principal dimensions:

Cylinder diameter 320 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	Weight dry engine
B32:40L6P	4390	5383	3778	1882	33200 kg
B32:40L8P	5430	6423	3898	1955	40000 kg
B32:40L9P	5950	6923	3899	2003	45900 kg

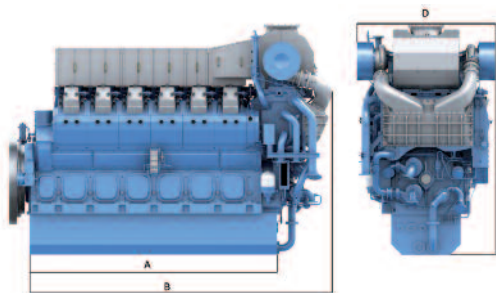
Technical data

Engine type		B32:40L6P	B32:40L8P	B32:40L9P
Number of cylinders		6	8	9
Engine speed	r/min	750	750	750
Mean piston speed	m/s	10	10	10
Max. continuous rating (MCR)	kW	3000	4000	4500
Max. continuous rating (MCR)	BHP (metric)	4080	5440	6120
Mean effective pressure (BMEP)	bar	24.9	24.9	24.9
Specific fuel consumption	g/kWh	184	184	184
Specific lubricating oil consumption	g/kWh	0.8	0.8	0.8
Cooling water temp. engine outlet	°C	90	90	90

Dimensions given apply for rigidly mounted engines with wet sump. Dry sump can be supplied upon request. Front end P.T.O. can be delivered upon request

Propulsion engines – Liquid fuel

Bergen B32:40V



Principal dimensions:

Cylinder diameter 320 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	Weight dry engine
B32: 40V12P	4951	6040	4470	2712	53700 kg
B32: 40V16P	6201	7698	4380	3192	62900 kg

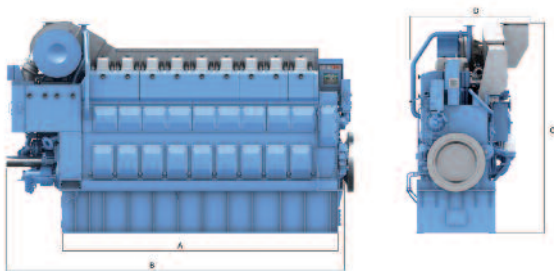
Technical data

Engine type		B32:40V12P	B32:40V16P
Number of cylinders		12	16
Engine speed	r/min	750	750
Mean piston speed	m/s	10	10
Max. continuous rating (MCR)	kW	6000	8000
Max. continuous rating (MCR)	BHP (metric)	8160	10880
Mean effective pressure (BMEP)	bar	24.9	24.9
Specific fuel consumption	g/kWh	184	184
Specific lubricating oil consumption	g/kWh	0.8	0.8
Cooling water temp. engine outlet	°C	90	90

Dimensions given apply for rigidly mounted engines with wet sump. Dry sump can be supplied upon request. Front end P.T.O. can be delivered upon request.

Propulsion engines – Gas

Bergen C26:33L



Principal dimensions:

Cylinder diameter 260 mm. Piston stroke 330 mm.

Engine type	A	B	C	D	Weight dry engine
C26:33L6PG	3170	4036	3195	1748	17500 kg
C26:33L8PG	3930	4796	3195	1748	20700 kg
C26:33L9PG	4310	5176	3230	1842	23900 kg

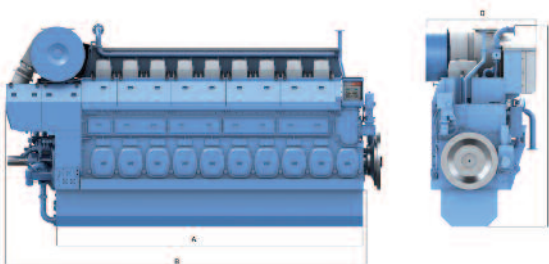
Technical data

Engine type		C26:33L6PG	C26:33L8PG*	C26:33L9PG
Number of cylinders		6	8	9
Engine speed	r/min	900/1000	900/1000	900/1000
Mean piston speed	m/s	10/11	10/11	10/11
Max. continuous rating (MCR)	kW	1460/1620	1940/2160	2190/2430
Max. continuous rating (MCR)	BHP (metric)	1985/2205	2675/2935	2980/3305
Mean effective pressure (BMEP)	bar	18.5	18.5	18.5
Specific energy consumption	kJ/kWh	7450/7550	7450/7500	7450/7500
Specific lubricating oil consumption	g/kWh	0.4	0.4	0.4
Cooling water temp. engine outlet	°C	90	90	90

* In progress – release date to be announced at later stage

Propulsion engines – Gas

Bergen B35:40L



Principal dimensions:

Cylinder diameter 350 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	Weight dry engine
B35:40L8PG	5430	6423	3898	1955	40000 kg
B35:40L9PG	5950	6943	3899	2003	45900 kg

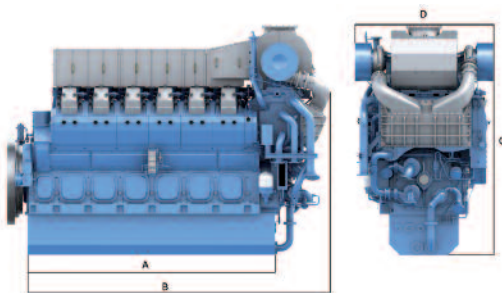
Technical data

Engine type		B35:40L8PG*	B35:40L9PG
Number of cylinders		8	9
Engine speed	r/min	750	750
Mean piston speed	m/s	10	10
Max. continuous rating (MCR)	kW	3500	3940
Max. continuous rating (MCR)	BHP (metric)	4760	5360
Mean effective pressure (BMEP)	bar	20	18.2
Specific energy consumption	kj/kWh	7480	7550
Specific lubricating oil consumption	g/kWh	0.4	0.4
Cooling water temp. engine outlet	°C	90	90

* In progress – release date to be announced at later stage

Propulsion engines – Gas

Bergen B35:40V



Principal dimensions:

Cylinder diameter 350 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	Weight dry engine
B35:40V12PG	5080	6040	4420	2712	58000 kg
B35:40V16PG2	6200	7870	4150	2920	62900 kg

Technical data

Engine type		B35:40V12PG*	B35:40V16PG2**
Number of cylinders		12	16
Engine speed	r/min	750	750
Mean piston speed	m/s	10	10
Max. continuous rating (MCR)	kW	5700	7700
Max. continuous rating (MCR)	BHP (metric)	7750	10470
Mean effective pressure (BMEP)	bar	20	20
Specific energy consumption	kJ/kWh	7475	7270
Specific lubricating oil consumption	g/kWh	0.4	0.4
Cooling water temp. engine outlet	°C	90	90

* Fuel gas inlet only available at the flywheel end.

** In progress – release date to be announced at later stage

Designed for robustness, harsh operational environments, and exceptional levels of reliability

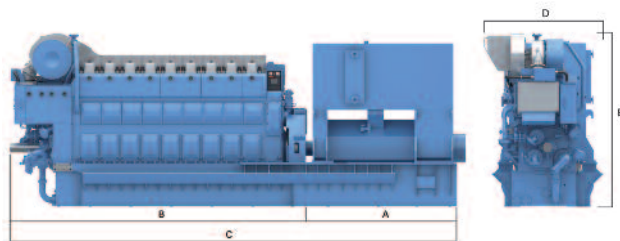


- Compact and powerful
- Low fuel oil consumption
- No leakage of fuel to lubricating oil system
- Service friendly
- Impulse type turbo charging system
 - Optimum response at all engine load points
- Super silent resilient mounting
- Designed for single bearing alternators



Generating Set – Liquid fuel

Bergen C25:33L



Principal dimensions:

Cylinder diameter 250 mm. Piston stroke 330 mm.

Engine type	A	B	C	D	E	Engine**	Weights dry	
							Alternator	Total
C25:33L6A	2799	4176	6975	1898	3195	21500 kg	9985 kg	31485 kg
C25:33L8A	2999	4936	7935	1898	3195	27800 kg	12200 kg	40000 kg
C25:33L9A	2999	5316	8315	1992	3230	31000 kg	12200 kg	43200 kg

Technical data

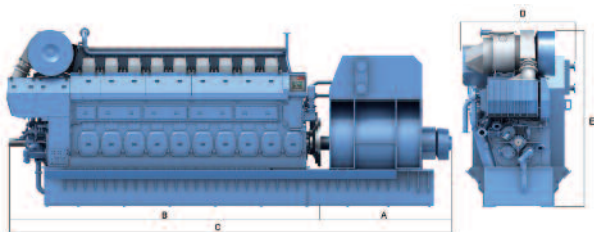
Engine type	C25:33L6A		C25:33L8A	C25:33L9A
Number of cylinders	6		8	9
Engine speed	r/min	900/1000*	900/1000*	900/1000*
Mean piston speed	m/s	10/11	10/11	10/11
Max. cont rating (MCR)	kW	1920/2000	2560/2665	2880/3000
Max. cont rating altern, ($\eta=0.96$)	kW	1843/1920	2457/2558	2764/2880
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	2303/2400	3071/3197	3455/3600
Max. cont rating altern, ($\cos\phi=0.9$)	kVA	2047/2133	2730/2961	3071/3200
Mean effective pressure (BMEP)	bar	26.4/24.7	26.4/24.7	26.4/24.7
Specific fuel consumption*	g/kWh	182/185	182/185	182/185
Specific lubricating oil consumption	g/kWh	0.7	0.7	0.7
Cooling water temp. engine outlet	°C	90	90	90

*MDO operations. Engine ** Engine and foundation

Dimensions given apply for resiliently mounted engines. Choice of alternator may effect the given dimensions and weights.

Generating Set – Liquid fuel

Bergen B32:40L



Principal dimensions:

Cylinder diameter 320 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	E	Engine**	Weights dry	
							Alternator	Total
B32:40L6A	3340	5498	8838	2150	3905	45300 kg	13300 kg	58600 kg
B32:40L8A	3540	6540	10080	2250	3855	50600 kg	15200 kg	65800 kg
B32:40L9A	3315	7060	10375	2310	3855	53300 kg	17750 kg	71050 kg

Technical data

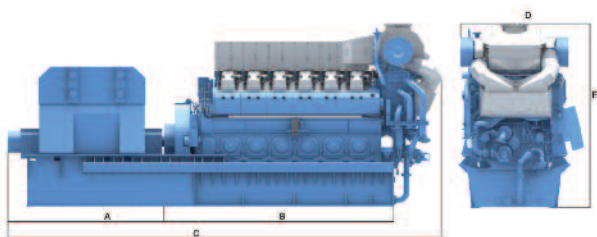
Engine type		B32:40L6A	B32:40L8A	B32:40L9A
Number of cylinders		6	8	9
Engine speed	r/min	720/750	720/750	720/750
Mean piston speed	m/s	9.6/10	9.6/10	9.6/10
Max. cont rating	kW	2880/3000	3840/4000	4320/4500
Max. cont rating altern, ($\eta=0.97$)	kW	2793/2910	3724/3880	4190/4365
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	3491/3637	4610/4850	5237/5456
Max. cont rating altern, ($\cos\phi=0.9$)	kVA	3103/3233	4137/4311	4655/4850
Mean effective pressure (BMEP)	bar	24.9	24.9	24.9
Specific fuel consumption	g/kWh	183/184	183/184	183/184
Specific lubricating oil consumption	g/kWh	0.8	0.8	0.8
Cooling water temp. engine outlet	°C	90	90	90

Engine ** Engine and foundation

Dimensions given apply for resiliently mounted engines. Choice of alternator may effect the given dimensions and weights.

Generating Set – Liquid fuel

Bergen B32:40V



Principal dimensions:

Cylinder diameter 320 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	E	Engine**	Weights dry	
							Alternator	Total
B32:40V12A	4095	6366	10461	2712	4751	72616 kg	29400 kg	102016 kg
B32:40V16A	3875	7861	11736	3194	4584	83500 kg	23500 kg	107000 kg

Technical data

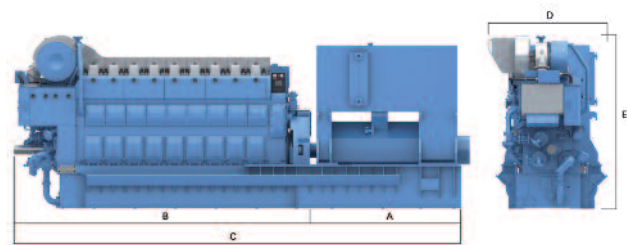
Engine type		B32:40 V12A	B32:40 V16A
Number of cylinders		12	16
Engine speed	r/min	720/750	720/750
Mean piston speed	m/s	9.6/10	9.6/10
Max. cont rating (MCR)	kW	5760/6000	7680/8000
Max. cont rating altern, ($\eta=0.97$)	kW	5587/5820	7449/7760
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	6983/7275	9311/9700
Max.cont rating altern, ($\cos\phi=0.9$)	kVA	6207/6466	8276/8622
Mean effective pressure (BMEP)	bar	24.9	24.9
Specific fuel consumption	g/kWh	183/184	183/184
Specific lubricating oil consumption	g/kWh	0.8	0.8
Cooling water temp. engine outlet	°C	90	90

Engine ** Engine and foundation

Dimensions given apply for resiliently mounted engines. Choice of alternator may effect the given dimensions and weights.

Generating Set – Gas

Bergen C26:33L



Principal dimensions:

Cylinder diameter 260 mm. Piston stroke 330 mm.

Engine type	A	B	C	D	E	Weights dry		
						Engine	Alternator	Total
C26:33L6AG	2799	4176	6975	1898	3195	21500 kg	9985 kg	31485 kg
C25:33L8AG	2999	4936	7935	1898	3195	27800 kg	12200 kg	40000 kg
C26:33L9AG	2999	5316	8315	1992	3230	31000 kg	12200 kg	43200 kg

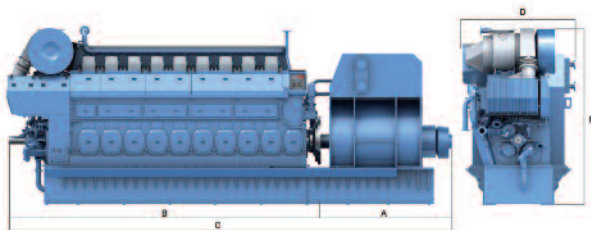
Technical data

Engine type		C26:33L6AG	C26:33L8AG*	C26:33L9AG
Number of cylinders		6	8	9
Engine speed	r/min	900/1000	900/1000	900/1000
Frequency	hz	60/50	60/50	60/50
Mean piston speed	m/s	10/11	10/11	10/11
Max. continuous rating (MCR)	kW	1460/1620	1940/2160	2190/2430
Max. cont rating altern, ($\eta=0.96$)	kW	1401/1555	1840/2050	2102/2332
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	1751/1943	2300/2563	2627/2915
Max. cont rating altern, ($\cos\phi=0.9$)	kVA	1556/1727	2044/2278	2335/2591
Mean effective pressure (BMEP)	bar	18.5	18.5	18.5
Specific energy consumption	kJ/kWh	7450/7550	7450/7550	7450/7550
Specific lubricating oil consumption	g/kWh	0.4	0.4	0.4
Cooling water temp. engine outlet	°C	90	90	90

* In progress – release date to be announced at later stage.

Generating Set – Gas

Bergen B35:40L



Principal dimensions:

Cylinder diameter 350 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	E	Engine	Weights dry	
							Alternator	Total
B35:40L8AG	3540	6540	10080	990	3855	50600 kg	15200 kg	65800 kg
B35:40L9AG	3315	7060	10375	1050	3855	53300 kg	17750 kg	71050 kg

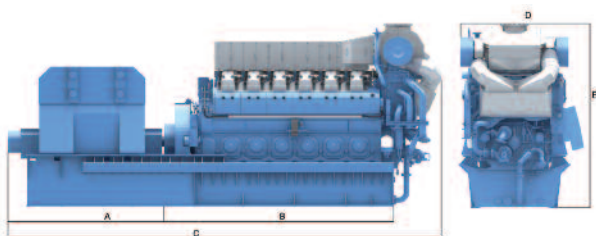
Technical data

Engine type		B35:40L8AG*	B35:40L9AG
Number of cylinders		8	9
Engine speed	r/min	720/750	720/750
Frequency	hz	60/50	60/50
Mean piston speed	m/s	9.6/10	9.6/10
Max. continuous rating (MCR)	kW	3360/3500	3780/3940
Max. cont rating altern, ($\eta=0.97$)	kW	3260/3395	3666/3821
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	4075/4243	4582/4776
Max. cont rating altern, ($\cos\phi=0.9$)	kVA	3622/3772	4073/4245
Mean effective pressure (BMEP)	bar	18.2	18.2
Specific energy consumption	kJ/kWh	7550	7550
Specific lubricating oil consumption	g/kWh	0.4	0.4
Cooling water temp. engine outlet	°C	90	90

* In progress – release date to be announced at later stage.

Generating Set – Gas

Bergen B35:40V



Principal dimensions:

Cylinder diameter 350 mm. Piston stroke 400 mm.

Engine type	A	B	C	D	E	Engine	Weights dry	
							Alternator	Total
B35:40V12AG	3948	6366	10306	2712	4620	66500 kg	21550 kg	88050 kg
B35:40V16AG	3561	7947	11507	3306	4587	81280 kg	24300 kg	105580 kg

Technical data

Engine type		B35:40V12AG	B35:40V16AG*
Number of cylinders		12	16
Engine speed	r/min	720/750	720/750
Frequency	hz	60/50	60/50
Mean piston speed	m/s	9.6/10	9.6/10
Max. continuous rating (MCR)	kW	5472/5700	7390/7700
Max. cont rating altern, ($\eta=0.97$)	kW	5307/5530	7090/7390
Max. cont rating altern, ($\cos\phi=0.8$)	kVA	6634/6912	8065/8400
Max. cont rating altern, ($\cos\phi=0.9$)	kVA	5898/6114	7877/8211
Mean effective pressure (BMEP)	bar	20	20
Specific energy consumption	kJ/kWh	7475	7270
Specific lubricating oil consumption	g/kWh	0.4	0.4
Cooling water temp. engine outlet	°C	90	90

* In progress – release date to be announced at later stage.

Natural gas system meeting IMO Tier III



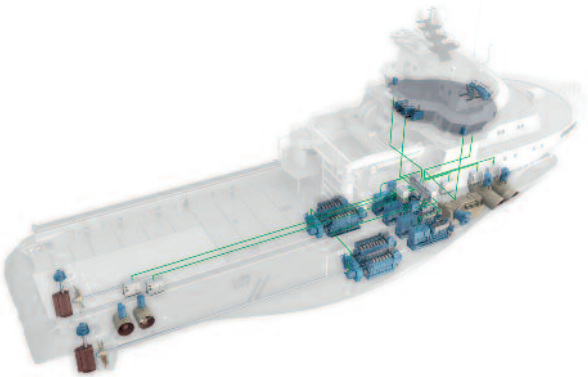
No need of:

- Selective Catalytic Reactors (SCR) to reduce NOx
- Urea/water tanks
- Scrubbers to reduce SOx
- Filters to reduce particles
- Main diesel tanks (bunkers tank, day- and settling tank, waste tank)
- Fuel separators and heat exchanger
- Piping and valves related to the traditional liquid fuel systems

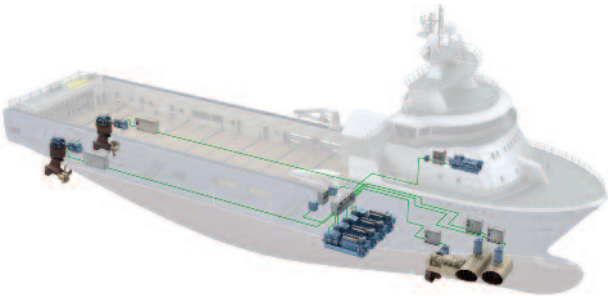
Easier, faster and less expensive installation for the shipyards



HSG hybrid system for ships



Diesel electric system for PSV



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Rolls-Royce Marine AS, Engines – Bergen

PO Box 924, N-5808 Bergen, Norway

Tel: +47 81 52 00 70

Fax: +47 55 53 61 04 (sales)

Fax: +47 55 19 04 05 (service)

Emergency technical customer support: +47 91 58 72 41

Emergency Spare Parts: +47 48 00 96 51

email: bergen.sales@rolls-royce.com

Rolls-Royce Marine AS, Propulsion Ulsteinvik

Serviceboks 22, N-6025 Ålesund, Norway

Tel: +47 81 52 00 70

Fax: +47 70 01 40 14

Emergency Service: +47 90 01 09 97

email: propulsion.ulstein@rolls-royce.com

www.rolls-royce.com