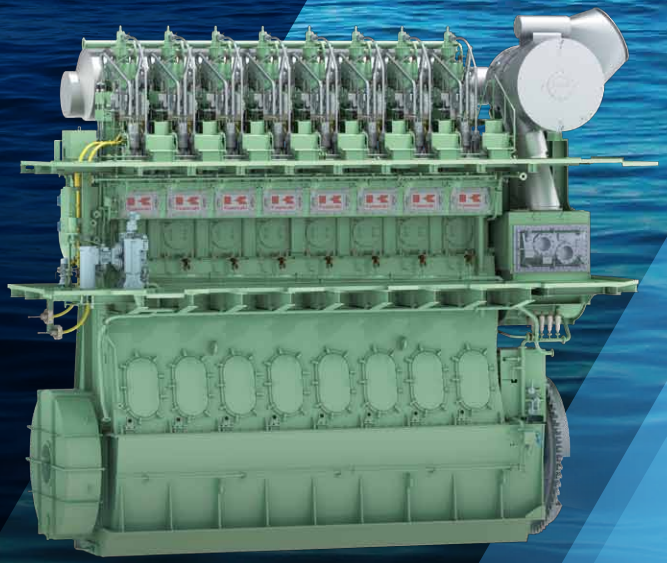
Kawasaki
Powering your potential

KAWASAKI-MAN B&W TWO-STROKE DIESEL ENGINE PROGRAM

KAWASAKI-MAN B&W TWO-STROKE DIESEL ENGINE PROGRAM

川崎-MAN B&W 2サイクルディーゼル機関
プログラム

1st edition 2017



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Our Business 私たちの事業

Through diverse business activities, Kawasaki will continue providing solutions for the issues facing our customers and society.

Together with 100 group companies in Japan and overseas, Kawasaki Heavy Industries oversees a group of technology-based corporations. We use our technological capabilities, refined over more than a century, to produce a diverse range of products that are used on land, sea and air, from the depths of the ocean to the deepness of space. We engage in wide-ranging businesses driven by diverse and high-level engineering technologies, including aerospace, rolling stock, ship and offshore structures, and energy solutions, as well as environmental and recycling plants, industrial plants, precision machinery, industrial robots, and infrastructure equipment. Finally, we operate our leisure and power products business including the production of motorcycles that are built on the Kawasaki brand. Through the development of a broad range of unique, unmatched businesses, we will continue to create new values that solve the issues facing our customers and society.

多彩な事業活動を通じて、いつの時代にもお客様や社会の課題に対するソリューションを提供し続けます。

国内外の100におよぶ関連企業とともに"技術の企業集団"を形成する川崎重工。一世紀を超える歴史のなかで磨きあげた技術力は、今や陸・海・空はもとより、宇宙から深海まで、幅広いフィールドに多彩な製品を送り出しています。航空宇宙事業、鉄道車両事業、船舶海洋事業、エネルギーソリューション事業、さらには環境・リサイクルプラントや産業用プラント、精密機械、産業用ロボット、インフラ設備など、多様かつ高度なエンジニアリング技術を駆使した幅広い事業。そしてKawasakiブランドで知られるモーターサイクルをはじめとしたレジャー&汎用製品事業。川崎重工は、他に類を見ないユニークかつ広汎な事業展開を通じて、お客様や社会の課題を解決する新たな価値創造に挑戦し続けます。

Powering your potential







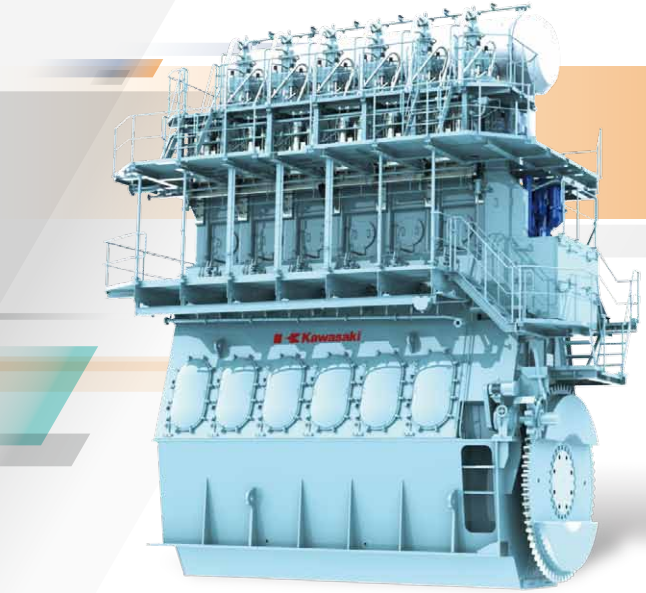





Our Two-Stroke Diesel Engine
川崎重工の2サイクルディーゼル機関

Kawasaki Diesel Engines have high quality backed up by ample experience in production over a century as well as high technology established as a manufacturer of various field products.

重工企業ならではの総合的な技術力と100年以上にわたる製造実績に裏付けられた、高品質2サイクルディーゼル機関をご提供いたします。



- The world's largest two-stroke diesel engine program with layout flexibility to secure the various selection of your propulsion system

  世界で最も豊富な機種を取り揃えており、最適な機関を選定することができます。

- Low specific fuel oil consumption together with optimum engine speed selection

  機関は低燃費設計となっていますが、最適な回転数の選定によりさらに燃料費を削減することができます。

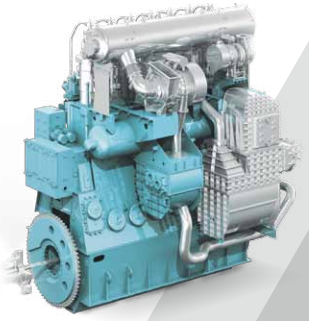
- Low specific fuel oil consumption over a wide operating range of part load by electric controlling and various engine tuning

  部分負荷においても、広い範囲にわたって電子制御及び各種チューニングにより低燃費を実現します。

K-ECOS ▸P.42

Kawasaki-ECO System "K-ECOS" is a Eco-friendly system combined with EGR, WEF (Water Emulsified Fuel) and T/C cut system for two-stroke diesel engines. K-ECOS is capable to clear IMO NOx Tier Ⅲ regulations with fuel saving and economical running.

Kawasaki-ECO System "K-ECOS"はEGR、水エマルジョン燃料、過給機カットシステムを備えた複合低環境負荷システムで、2サイクルディーゼル機関に搭載可能です。IMO NOx 3次規制をクリアするとともに低燃費、低ランニングコストを実現します。

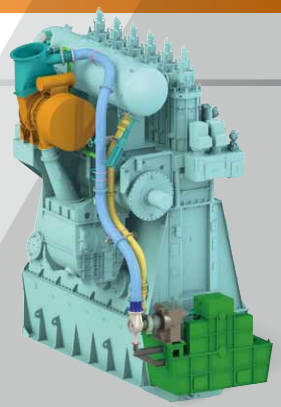


Leading development
世界に先駆けた開発

K-GET ▸P.43

Kawasaki-Green Eco Turbine "K-GET" is a turbo compound system for two-stroke diesel engines. K-GET is capable to achieve lower fuel oil consumption with a high efficiency power turbine developed by Kawasaki.

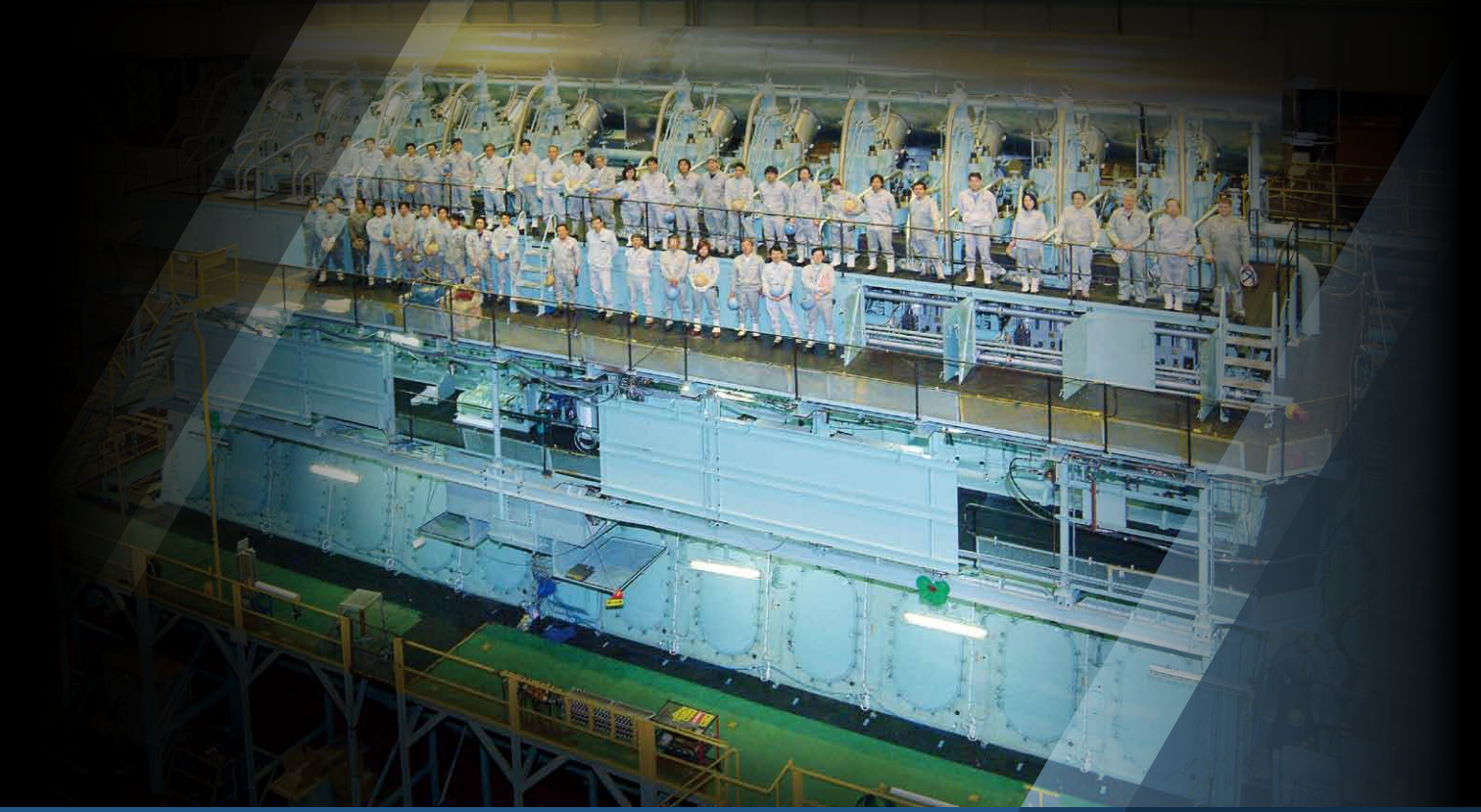
Kawasaki-Green Eco Turbine "K-GET"は2サイクルディーゼル機関に搭載可能なターボコンパウンドシステムです。自社開発の高効率パワータービンを備え、低燃費を実現します。



Full Scale Test Engine

Kawasaki has a full scale test engine 2S50ME-C in Kobe Works. K-ECOS (EGR, WEF, T/C cut system) and ME-GI configuration are applied to the engine, and various tests are being carried out continuously.

実機サイズの試験機関2S50ME-Cを当社神戸工場に設置。試験機関には、K-ECOS(EGR、水エマルジョン燃料、過給機カットシステム)を搭載している他、ME-GI化しており、多種多様な試験を継続的に実施しています。



OUTLINE

概　要

Photo:
World largest electronically controlled engine 12K98ME
世界最大級の12K98ME機関

Kawasaki-MAN B&W Engine Program
川崎-MAN B&W機関プログラム

All engines in this program comply with IMO NOx emission regulations. All engines with K-ECOS, EGR or SCR comply with IMO NOx emission regulations Tier Ⅲ.

本プログラムに記載の全ての機関はIMO NOx 規制に対応しています。当社独自開発のK-ECOSやEGR、SCRを搭載することでIMO NOx 3次規制に対応します。

ME-C/ME-B Engine ME-C/ME-B機関

In ME-C engines, fuel injection timing, actuation of exhaust valves and starting valves and cylinder lubrication are controlled electronically.

ME-C機関では、燃焼噴射や排気弁・始動弁の作動ならびにシリンダ注油が電子制御されます。

In ME-B engines, fuel injection timing is electronically controlled. Exhaust valves are driven by cams and have a variable closing timing function.

ME-B機関では、燃料噴射は電子制御され、排気弁はカムにより開閉します。また、排気弁の閉タイミングを可変制御する機能を備えています。

Advantages of ME-C/ME-B engines

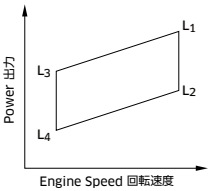
ME-C/ME-B機関の利点

- ■ Optimized fuel oil consumption over a wide power range
  広い負荷範囲にわたる燃費の最適化
- ■ Improved cylinder lube oil consumption
  シリンダ油消費量の低減
- ■ Improved low-load running performance
  低負荷運転性能の向上
- ■ Adaptation to different fuel oil qualities
  さまざまな燃料性状に適応
- ■ Better part-load and low-load efficiency
  良好な部分負荷/低負荷での効率

Layout Diagram 機関計画線図

The layout diagram applicable for the engines is defined by the power and speed combinations L1, L2, L3 and L4. Any combination of speed and power within the layout diagram may be used for selecting the MCO point.

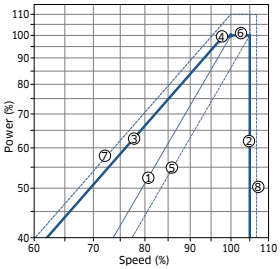
機関計画線図は出力と回転速度の組み合わせによる点L1、L2、L3、L4で定義されます。機関計画線図内で選択した回転数と出力の組み合わせを最大連続出力MCOとして使用することができます。



Load Diagram 機関運転領域線図

The load diagram defines the power and speed limits for continuous as well as overload operation of the engine.

機関運転領域線図は機関の連続および過負荷運転における制限を示します。



① Propeller curve for engine layout (heavy running)
機関計画プロペラ曲線(重力率)
② Speed limit
回転速度制限線
③ Torque/speed limit
トルク/回転速度制限線
④ Mean effective pressure limit
正味平均有効圧力制限線
⑤ Propeller curve for propeller layout (light running)
プロペラ計画プロペラ曲線(軽力率)
⑥ Power limit for continuous running
連続運転出力制限線
⑦ Overload limit
過負荷制限線
⑧ Speed limit at sea trial
海上運転時の回転速度制限

The continuous service range is limited by lines ③,④,⑥ and ②. The area between ③,④,⑥ and ⑦ is available for overload running for limited periods only (1 hour per 12 hours).

連続運転は③、④、⑥、②で囲まれた運転領域に限られます。③、④、⑥、⑦で囲まれた領域は過負荷運転となるので短時間(12時間に1時間)だけ許容されます。

Specific Fuel Oil Consumption (SFOC)
燃料消費率

The SFOC figures are based on the use of fuel with a lower calorific value (LCV) equal to 42,700 kJ/kg at ISO conditions:

記載されている燃料消費率は低位発熱量42,700kJ/kg、ISO周囲条件での値です。

■ Ambient air pressure	大気圧	100kPa
■ Ambient air temperature	大気温度	25°C
■ Cooling water temperature	冷却水温度	25°C

SFOC guarantee tolerances are as follows:

保証燃費のトレランスは以下の通りです。

- 100% – 85% MCO: 5% tolerance
- 84% – 65% MCO: 6% tolerance
- 64% – 50% MCO: 7% tolerance

Please note that the SFOC guarantee can only be given in one load point under Tier Ⅱ and Fuel Oil operation mode.

燃費保証は1つの負荷で行います。運転モードは2次規制の燃料油運転モードです。

SFOC Optimization 燃費最適化

SFOC is optimized in high-load range as standard.
To the above 45 cm bore engines, SFOC optimization for improved part-load and low-load SFOC can be applied as an option.

標準では高負荷で燃費最適化を行います。ボア径45cm以上の全ての機関では、オプションとして部分負荷および低負荷で燃費最適化を適用することができます。

Optimization of SFOC in the part-load or low-load range requires selection of a tuning method:

部分負荷もしくは低負荷での燃費最適化の方法として以下を選択できます。

- EGB: Exhaust Gas Bypass
- HPT: High Pressure Tuning (only available on ME-C engines)

The above tuning methods are available for all MCO in the specific engine layout diagram, but cannot be combined. The SFOC reduction potential of each tuning method together with full rated (L1/L3) and maximum derated (L2/L4) can be seen on Product Specification page.

上記の最適化手法は、機関計画線図の中から選択された全てのMCOでの適用が可能ですが、組み合わせることはできません。L1/L3ライン・L2/L4ラインにおける各最適化手法適用時の燃費低減効果を製品仕様のページに記載しています。

ME-GI Engine ME-GI機関

GI Dual Fuel Engines / GI 2元燃料機関

With the designation GI (gas injection), ME-C/ME-B engines are available as dual fuel engines for natural gas operation.

ME-C/ME-B機関は、GI用機器の搭載により天然ガス運転も可能な2元燃料機関として使用することができます。

LGI Dual Fuel Engines / LGI 2元燃料機関

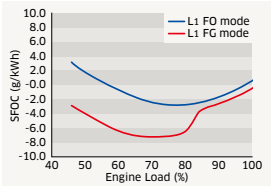
With the designation LGI (liquid gas injection), ME-C/ME-B engines are available as dual fuel engines for operation on low flashpoint liquid (LFL) fuels like methanol and LPG.

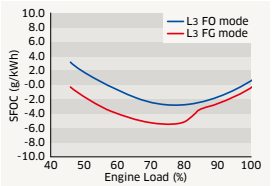
ME-C/ME-B機関は、LGI用機器の搭載により、メタノールやLPGといった発火点の低い液体燃料による運転も可能な2元燃料機関として使用することができます。

SFOC Curves for GI Engines / GI機関の燃費カーブ

Examples of SFOC curves for GI engines with liquid fuel and gas fuel are shown on the following two graphs for L1 and L3 layout points, respectively. Fuel savings depend on the engine type.

GI機関の重油燃料とガス燃料における燃料消費量の例をL1点とL3点それぞれにおいて示します。燃費削減効果は機関型式によって異なります。





Conventional Engines 従来型機関

Regarding selection of the conventional engines, please contact us individually.

従来型機関の対応については個別に弊社までご相談ください。

PRODUCT SPECIFICATION

製品仕様

Photo:
World first S60ME-C electronically controlled engine
世界初のS60ME-C機関

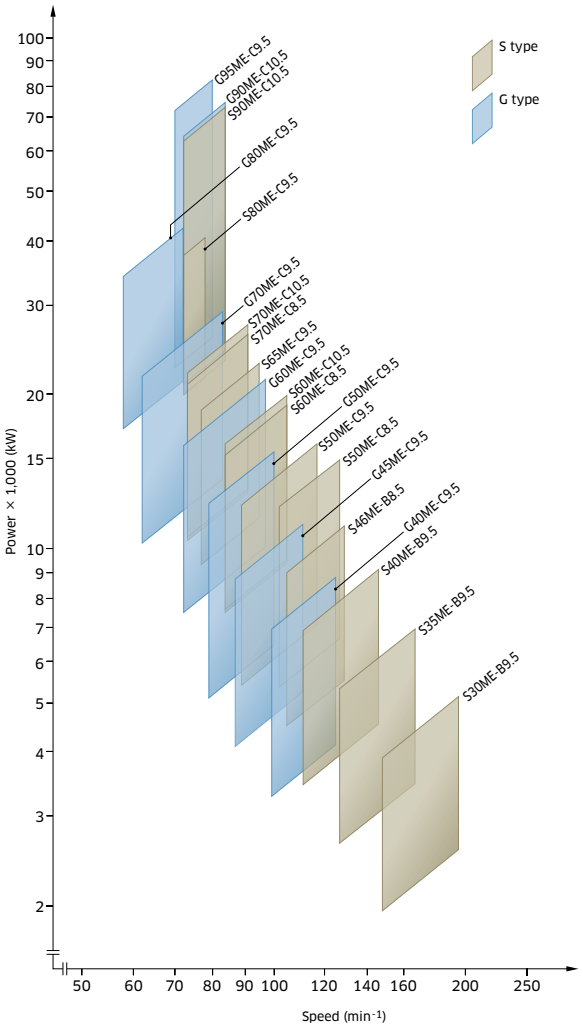
Specification and Dimensions Tables 諸元表

Engine Type Designation / 機関型式

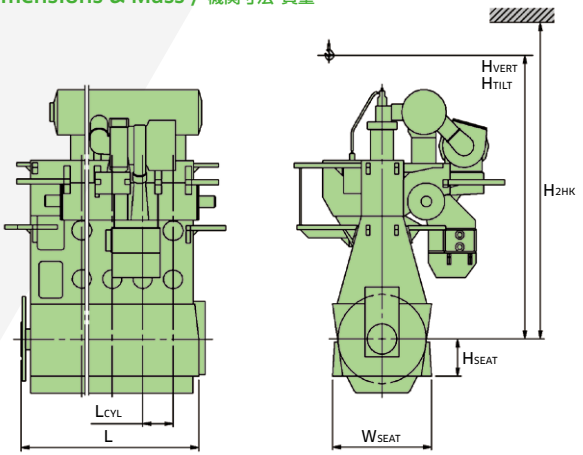
6 S 60 M E -C 8.5 -GI

- **6** — Number of cylinders
  シリンダ数
- **S** — Stroke/bore ratio
  ストローク/ボア比
  - **G** 'Green' Ultra long stroke
    "Green" ウルトラロングストローク
  - **S** Super long stroke
    スーパーロングストローク
- **60** — Diameter of piston in cm
  ピストン径 cm
- **M** — Engine program series
  機関シリーズ
- **E** — Concept
  コンセプト
  - **E** Electronically controlled
    電子制御型
- **-C** — Design
  設 計
  - **B** Exhaust valve controlled by camshaft
    カム制御排気弁型
  - **C** Compact engine
    コンパクト型
- **8.5** — Mark number
  マークナンバー
- **-GI** — Fuel injection concept
  燃料噴射
  - (blank) Fuel oil only
    重油専焼
  - **GI** Gas Injection
    ガス噴射
  - **LGI** Liquid Gas Injection
    液体ガス噴射

Power, Speed Range / 出力、回転速度範囲



Dimensions & Mass / 機関寸法・質量



Dismantling height of piston (guidance only)
ピストン抜き高さ (参考)

HVERT Vertical lift (from crankshaft center to crane hook)
垂直吊り (クランク軸中心からクレーンフックまで)

HTILT Tilted lift (from crankshaft center to crane hook)
傾斜吊り (クランク軸中心からクレーンフックまで)

H2HK Lift using 2-hook crane (from crankshaft center to the lowest beam)
2フッククレーンによる吊上げ (クランク軸中心から1番下のビームまで)

Dry masses are for engines with standard flywheel. Dry masses and installation length L can vary depending on the design and options chosen such as moment compensators, tuning wheel, etc.

乾燥質量は標準のはずみ車を装備した機関のものです。乾燥質量と据付長さLは設計、およびモーメントコンペンセータやチューニングホイールなどのオプションの選択によって変わります。

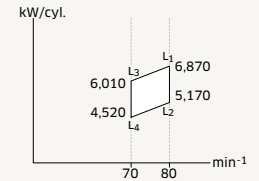
Abbreviation in Product Specification Page
製品仕様ページの略称

EGB : Exhaust Gas Bypass
HPT : High Pressure Tuning
SFOC : Specific Fuel Oil Consumption
Pme : Mean Effective Pressure

G95ME-C9.5(-GI)

Stroke: 3,460mm
Bore: 950mm

Cyl.	L1 [kW]	L1 [PS]
5	34,350	46,716
6	41,220	56,059
7	48,090	65,402
8	54,960	74,746
9	61,830	84,089
10	68,700	93,432
11	75,570	102,775
12	82,440	112,118



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	162.5	161.6	166.0
Part load	EGB/HPT	160.5	160.1	168.5
Low load	EGB/HPT	158.5	161.1	168.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	158.5	155.5	159.0
Part load	EGB/HPT	156.5	154.0	161.5
Low load	EGB/HPT	154.5	155.0	161.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
mm	see below	5,380	2,060	15,925	*	*

LCYL	5-9 cyl.	10 cyl.	11 cyl.	12 cyl.
mm	1,574	1-6: 1,574	1-6: 1,574	1-6: 1,574
mm		7-10: 1,670	7-11: 1,670	7-12: 1,670

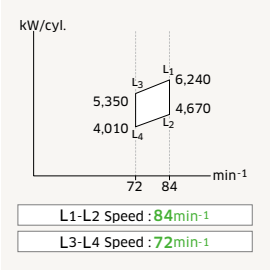
Cylinders:	5	6	7	8	9	10	11	12
L mm	11,468	13,042	14,616	16,190	17,804	19,779	21,489	23,159
Dry mass t	1,080	1,250	1,430	1,625	1,820	2,010	2,210	2,400

*Data is available on request / お問い合わせください。

G90ME-C10.5(-GI)

Stroke: 3,260㎜
Bore: 900㎜

Cyl.	L1 [kW]	L1 [PS]
5	31,200	42,432
6	37,440	50,918
7	43,680	59,405
8	49,920	67,891
9	56,160	76,378
10	62,400	84,864
11	68,640	93,350
12	74,880	101,837



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.15MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	161.5	160.6	165.0
Part load	EGB/HPT	159.5	159.1	167.5
Low load	EGB/HPT	157.5	160.1	167.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.61MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	157.5	154.5	158.0
Part load	EGB/HPT	155.5	153.0	160.5
Low load	EGB/HPT	153.5	154.0	160.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,490	5,110	1,885	14,425	*	*

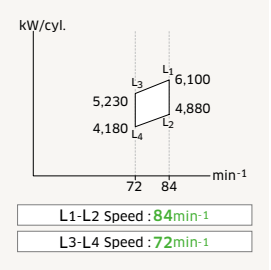
Cylinders:	5	6	7	8	9	10	11	12
L ㎜	9,920	11,410	12,900	14,390	15,880	18,040	19,530	21,020
Dry mass t	876	1,014	1,153	1,295	1,457	1,619	1,771	1,915

*Data is available on request / お問い合わせください。

S90ME-C10.5(-GI)

Stroke: 3,260㎜
Bore: 900㎜

Cyl.	L1 [kW]	L1 [PS]
5	30,500	41,480
6	36,600	49,776
7	42,700	58,072
8	48,800	66,368
9	54,900	74,664
10	61,000	82,960
11	67,100	91,256
12	73,200	99,552



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	162.5	161.6	166.0
Part load	EGB/HPT	160.5	160.1	168.5
Low load	EGB/HPT	158.5	161.1	168.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.68MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	158.5	155.6	160.0
Part load	EGB/HPT	156.5	154.1	162.5
Low load	EGB/HPT	154.5	155.1	162.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,590	5,160	1,900	15,000	*	*

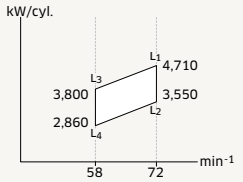
Cylinders:	5	6	7	8	9	10	11	12
L ㎜	10,312	11,902	13,492	16,135	17,725	19,315	20,905	22,495
Dry mass t	953	1,104	1,255	1,446	1,626	1,771	1,942	2,088

*Data is available on request / お問い合わせください。

G80ME-C9.5(-GI)

Stroke: 3,720㎜
Bore: 800㎜

Cyl.	L1 [kW]	L1 [PS]
6	28,260	38,434
7	32,970	44,839
8	37,680	51,245
9	42,390	57,650



L1-L2 Speed : 72min-1
L3-L4 Speed : 58min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	162.5	161.6	166.0
Part load	EGB/HPT	160.5	160.1	168.5
Low load	EGB/HPT	158.5	161.1	168.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	158.5	155.5	159.0
Part load	EGB/HPT	156.5	154.0	161.5
Low load	EGB/HPT	154.5	155.0	161.5

Dimensions and Mass / 機関寸法および重量

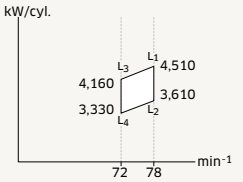
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,400	5,320	1,960	16,100	*	*

Cylinders:	6	7	8	9
L ㎜	10,735	12,135	13,535	15,880
Dry mass t	945	1,055	1,175	1,350

S80ME-C9.5(-GI)

Stroke: 3,450㎜
Bore: 800㎜

Cyl.	L1 [kW]	L1 [PS]
6	27,060	36,802
7	31,570	42,935
8	36,080	49,069
9	40,590	55,202



L1-L2 Speed : 78min-1
L3-L4 Speed : 72min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	164.5	162.1	166.0
Part load	EGB/HPT	161.5	160.6	167.5
Low load	EGB/HPT	159.5	161.6	167.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	160.5	156.1	160.0
Part load	EGB/HPT	157.5	154.6	161.5
Low load	EGB/HPT	155.5	155.6	161.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,334	5,180	1,890	15,050	13,925	13,500

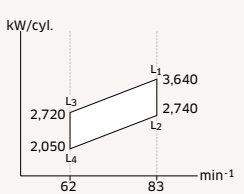
Cylinders:	6	7	8	9
L ㎜	10,100	11,434	12,768	14,102
Dry mass t	833	933	1,043	1,153

*Data is available on request / お問い合わせください。

G70ME-C9.5(-GI)

Stroke: 3,256㎜
Bore: 700㎜

Cyl.	L1 [kW]	L1 [PS]
5	18,200	24,752
6	21,840	29,702
7	25,480	34,653
8	29,120	39,603



L1-L2 Speed : 83min-1
L3-L4 Speed : 62min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	165.5	163.1	167.0
Part load	EGB/HPT	162.5	161.6	168.5
Low load	EGB/HPT	160.5	162.6	168.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	161.5	157.0	160.0
Part load	EGB/HPT	158.5	155.5	161.5
Low load	EGB/HPT	156.5	156.5	161.5

Dimensions and Mass / 機関寸法および重量

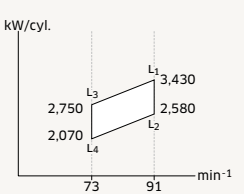
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,260	4,760	1,750	14,225	13,250	12,800

Cylinders:	5	6	7	8
L ㎜	8,486	9,596	10,856	12,116
Dry mass t	585	665	750	855

S70ME-C10.5(-GI)

Stroke: 2,800㎜
Bore: 700㎜

Cyl.	L1 [kW]	L1 [PS]
5	17,150	23,324
6	20,580	27,989
7	24,010	32,654
8	27,440	37,318



L1-L2 Speed : 91min-1
L3-L4 Speed : 73min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	164.5	162.1	166.0
Part load	EGB/HPT	161.5	160.6	167.5
Low load	EGB/HPT	159.5	161.6	167.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	160.5	156.0	159.0
Part load	EGB/HPT	157.5	154.5	160.5
Low load	EGB/HPT	155.5	155.5	160.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,098	4,012	1,520	12,500	*	*

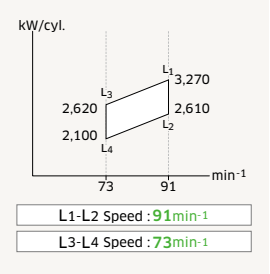
Cylinders:	5	6	7	8
L ㎜	7,464	8,562	9,660	10,758
Dry mass t	442	523	593	667

*Data is available on request / お問い合わせください。

S70ME-C8.5(-GI)

Stroke: 2,800㎜
Bore: 700㎜

Cyl.	L1 [kW]	L1 [PS]
5	16,350	22,236
6	19,620	26,683
7	22,890	31,130
8	26,160	35,578



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	167.5	165.1	169.0
Part load	EGB/HPT	164.5	163.6	170.5
Low load	EGB/HPT	162.5	164.6	170.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	163.5	159.1	163.0
Part load	EGB/HPT	160.5	157.6	164.5
Low load	EGB/HPT	158.5	158.6	164.5

Dimensions and Mass / 機関寸法および重量

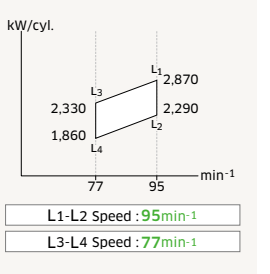
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,190	4,390	1,521	12,550	11,725	11,500

Cylinders:	5	6	7	8
L ㎜	7,781	8,971	10,161	11,351
Dry mass t	451	534	605	681

S65ME-C8.5(-GI)

Stroke: 2,730㎜
Bore: 650㎜

Cyl.	L1 [kW]	L1 [PS]
5	14,350	19,516
6	17,220	23,419
7	20,090	27,322
8	22,960	31,226



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	167.5	165.1	169.0
Part load	EGB/HPT	164.5	163.6	170.5
Low load	EGB/HPT	162.5	164.6	170.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	163.5	159.1	163.0
Part load	EGB/HPT	160.5	157.6	164.5
Low load	EGB/HPT	158.5	158.6	164.5

Dimensions and Mass / 機関寸法および重量

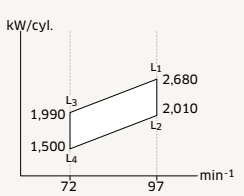
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,084	4,124	1,410	11,950	11,225	11,025

Cylinders:	5	6	7	8
L ㎜	7,148	8,232	9,316	10,400
Dry mass t	382	451	512	575

G60ME-C9.5(-GI)

Stroke: 2,790㎜
Bore: 600㎜

Cyl.	L1 [kW]	L1 [PS]
5	13,400	18,224
6	16,080	21,869
7	18,760	25,514
8	21,440	29,158



L1-L2 Speed : 97min-1
L3-L4 Speed : 72min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	165.5	163.1	167.0
Part load	EGB/HPT	162.5	161.6	168.5
Low load	EGB/HPT	160.5	162.6	168.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	161.5	157.0	160.0
Part load	EGB/HPT	158.5	155.5	161.5
Low load	EGB/HPT	156.5	156.5	161.5

Dimensions and Mass / 機関寸法および重量

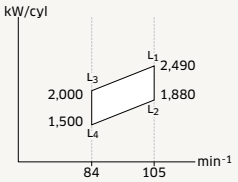
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,080	4,090	1,500	12,175	11,400	11,075

Cylinders:	5	6	7	8
L ㎜	7,390	8,470	9,550	10,630
Dry mass t	395	439	491	543

S60ME-C10.5(-GI)

Stroke: 2,400㎜
Bore: 600㎜

Cyl.	L1 [kW]	L1 [PS]
5	12,450	16,932
6	14,940	20,318
7	17,430	23,705
8	19,920	27,091



L1-L2 Speed : 105min-1
L3-L4 Speed : 84min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	164.5	162.1	166.0
Part load	EGB/HPT	161.5	160.6	167.5
Low load	EGB/HPT	159.5	161.6	167.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	160.5	156.0	159.0
Part load	EGB/HPT	157.5	154.5	160.5
Low load	EGB/HPT	155.5	155.5	160.5

Dimensions and Mass / 機関寸法および重量

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	970	3,500	1,325	*	*	*

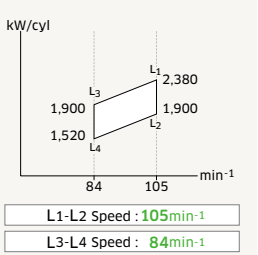
Cylinders:	5	6	7	8
L ㎜	6,455	7,425	8,395	9,365
Dry mass t	*	*	*	*

*Data is available on request / お問い合わせください。

S60ME-C8.5(-GI)

Stroke: 2,400㎜
Bore: 600㎜

Cyl.	L1 [kW]	L1 [PS]
5	11,900	16,184
6	14,280	19,421
7	16,660	22,658
8	19,040	25,894



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	167.5	165.1	169.0
Part load	EGB/HPT	164.5	163.6	170.5
Low load	EGB/HPT	162.5	164.6	170.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	163.5	159.1	163.0
Part load	EGB/HPT	160.5	157.6	164.5
Low load	EGB/HPT	158.5	158.6	164.5

Dimensions and Mass / 機関寸法および重量

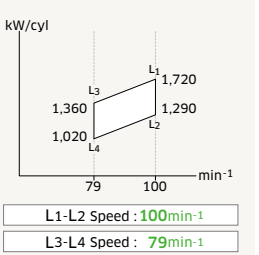
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	1,020	3,770	1,300	10,800	10,000	9,775

Cylinders:	5	6	7	8
L ㎜	6,668	7,688	8,708	9,728
Dry mass t	308	350	393	452

G50ME-C9.5(-GI)

Stroke: 2,500㎜
Bore: 500㎜

Cyl.	L1 [kW]	L1 [PS]
5	8,600	11,696
6	10,320	14,035
7	12,040	16,374
8	13,760	18,714
9	15,480	21,053



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率

L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	166.5	164.1	168.0
Part load	EGB/HPT	163.5	162.6	169.5
Low load	EGB/HPT	161.5	163.6	169.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率

L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	162.5	158.0	161.0
Part load	EGB/HPT	159.5	156.5	162.5
Low load	EGB/HPT	157.5	157.5	162.5

Dimensions and Mass / 機関寸法および重量

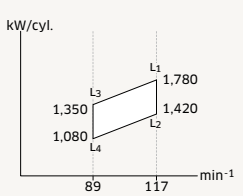
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	872	3,776	1,205	10,775	10,075	9,775

Cylinders:	5	6	7	8	9
L ㎜	6,260	7,132	8,004	8,876	9,748
Dry mass t	210	245	275	310	345

S50ME-C9.5(-GI)

Stroke: 2,214㎜
Bore: 500㎜

Cyl.	L1 [kW]	L1 [PS]
5	8,900	12,104
6	10,680	14,525
7	12,460	16,946
8	14,240	19,366
9	16,020	21,787



L1-L2 Speed : 117min-1
L3-L4 Speed : 89min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	167.5	165.1	169.0
Part load	EGB/HPT	164.5	163.6	170.5
Low load	EGB/HPT	162.5	164.6	170.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 L2/L4 Pme **1.68MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	163.5	159.1	163.0
Part load	EGB/HPT	160.5	157.6	164.5
Low load	EGB/HPT	158.5	158.6	164.5

Dimensions and Mass / 機関寸法および重量

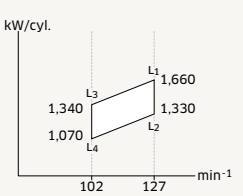
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	875	3,350	1,190	9,775	9,200	8,900

Cylinders:	5	6	7	8	9
L ㎜	6,073	6,948	7,823	8,698	9,573
Dry mass t	190	220	255	285	315

S50ME-C8.5(-GI)

Stroke: 2,000㎜
Bore: 500㎜

Cyl.	L1 [kW]	L1 [PS]
5	8,300	11,288
6	9,960	13,546
7	11,620	15,803
8	13,280	18,061
9	14,940	20,318



L1-L2 Speed : 127min-1
L3-L4 Speed : 102min-1

SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	168.5	166.1	170.0
Part load	EGB/HPT	165.5	164.6	171.5
Low load	EGB/HPT	163.5	165.6	171.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	164.5	160.1	164.0
Part load	EGB/HPT	161.5	158.6	165.5
Low load	EGB/HPT	159.5	159.6	165.5

Dimensions and Mass / 機関寸法および重量

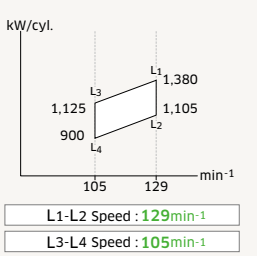
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	850	3,150	1,085	9,050	8,500	8,250

Cylinders:	5	6	7	8	9
L ㎜	5,924	6,774	7,624	8,474	9,324
Dry mass t	180	210	240	270	295

S46ME-B8.5(-GI)

Stroke: 1,932㎜
Bore: 460㎜

Cyl.	L1 [kW]	L1 [PS]
5	6,900	9,384
6	8,280	11,261
7	9,660	13,138
8	11,040	15,014



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.00MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	169.5	167.2	170.0
Part load	EGB	166.5	165.7	171.5
Low load	EGB	164.5	166.7	171.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.60MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	165.5	163.2	166.0
Part load	EGB	162.5	161.7	167.5
Low load	EGB	160.5	162.7	167.5

Dimensions and Mass / 機関寸法および重量

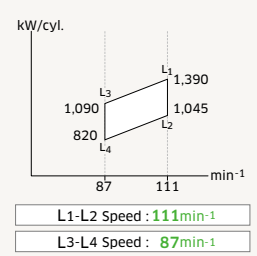
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	782	2,924	986	9,000	8,175	7,900

Cylinders:	5	6	7	8
L ㎜	5,528	6,310	7,092	7,874
Dry mass t	159	177	199	219

G45ME-C9.5(-GI)

Stroke: 2,250㎜
Bore: 450㎜

Cyl.	L1 [kW]	L1 [PS]
5	6,950	9,452
6	8,340	11,342
7	9,730	13,233
8	11,120	15,123



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	168.5	166.1	170.0
Part load	EGB/HPT	165.5	164.6	171.5
Low load	EGB/HPT	163.5	165.6	171.5

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	164.5	160.0	163.0
Part load	EGB/HPT	161.5	158.5	164.5
Low load	EGB/HPT	159.5	159.5	164.5

Dimensions and Mass / 機関寸法および重量

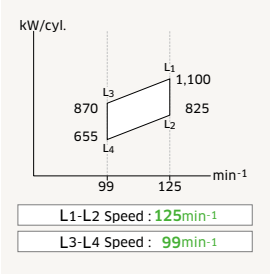
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	784	3,350	1,169	9,725	9,525	9,250

Cylinders:	5	6	7	8
L ㎜	5,638	6,464	7,290	8,116
Dry mass t	163	183	206	234

G40ME-C9.5(-GI)

Stroke: 2,000㎜
Bore: 400㎜

Cyl.	L1 [kW]	L1 [PS]
5	5,500	7,480
6	6,600	8,976
7	7,700	10,472
8	8,800	11,968



SFOC on **L1-L3** Line [g/kWh] / **L1-L3ラインの燃費率** L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	173.5	171.1	175.0

SFOC on **L2-L4** Line [g/kWh] / **L2-L4ラインの燃費率** L2/L4 Pme **1.58MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	169.5	167.0	170.0

Dimensions and Mass / **機関寸法および重量**

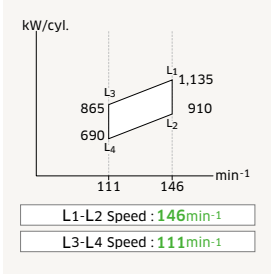
Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	700	3,020	1,039	8,700	*	*

Cylinders:	5	6	7	8
L ㎜	5,012	5,712	6,412	7,112
Dry mass t	119	135	153	173

S40ME-B9.5(-GI)

Stroke: 1,770㎜
Bore: 400㎜

Cyl.	L1 [kW]	L1 [PS]
5	5,675	7,718
6	6,810	9,262
7	7,945	10,805
8	9,080	12,349
9	10,215	13,892



SFOC on **L1-L3** Line [g/kWh] / **L1-L3ラインの燃費率** L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	173.5	171.2	174.0

SFOC on **L2-L4** Line [g/kWh] / **L2-L4ラインの燃費率** L2/L4 Pme **1.68MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	169.5	167.2	170.0

Dimensions and Mass / **機関寸法および重量**

Dimensions:	LCYL	WSEAT	HSEAT	HVERT	HTILT	H2HK
㎜	700	2,650	950	7,800	7,475	7,200

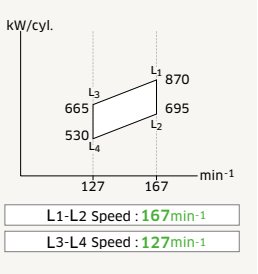
Cylinders:	5	6	7	8	9
L ㎜	5,000	5,700	6,400	7,100	7,800
Dry mass t	112	131	148	163	195

*Data is available on request / お問い合わせください。

S35ME-B9.5(-GI)

Stroke: 1,550㎜
Bore: 350㎜

Cyl.	L1 [kW]	L1 [PS]
5	4,350	5,916
6	5,220	7,099
7	6,090	8,282
8	6,960	9,466



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	174.5	172.2	175.0

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.68MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	170.5	168.4	171.0

Dimensions and Mass / 機関寸法および重量

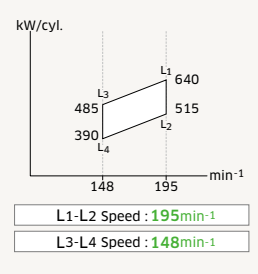
Dimensions:	Lcyl	Wseat	Hseat	Hvert	Htilt	H2hk
㎜	612	2,300	830	6,925	6,625	6,275

Cylinders:	5	6	7	8
L ㎜	4,378	4,990	5,602	6,214
Dry mass t	81	90	99	111

S30ME-B9.5(-GI)

Stroke: 1,328㎜
Bore: 300㎜

Cyl.	L1 [kW]	L1 [PS]
5	3,200	4,352
6	3,840	5,222
7	4,480	6,093
8	5,120	6,963



SFOC on L1-L3 Line [g/kWh] / L1-L3ラインの燃費率 — L1/L3 Pme **2.10MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	175.5	173.2	176.0

SFOC on L2-L4 Line [g/kWh] / L2-L4ラインの燃費率 — L2/L4 Pme **1.68MPa**

SFOC optimized load range	Tuning	50%	75%	100%
High load	—	171.5	169.4	172.0

Dimensions and Mass / 機関寸法および重量

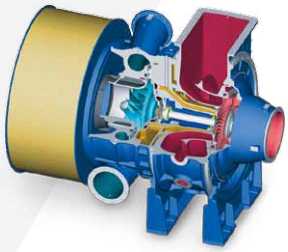
Dimensions:	Lcyl	Wseat	Hseat	Hvert	Htilt	H2hk
㎜	538	1,980	712	6,025	5,950	5,625

Cylinders:	5	6	7	8
L ㎜	4,087	4,625	5,163	5,701
Dry mass t	61	69	77	86

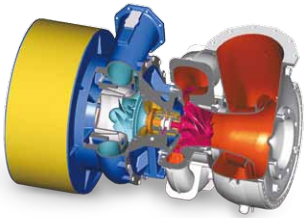
Turbocharger 過給機

Kawasaki-MAN TCA/TCR Turbocharger has been developed to meet the growing demands for high turbocharging two, four-stroke diesel engines and gas engines.

川崎-MAN TCA/TCR型過給機シリーズは、2サイクル/4サイクルディーゼル機関・ガスエンジンに求められる「高圧力比・高効率」の要望に応えるため開発されました。



TCA



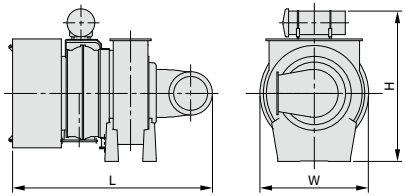
TCR

The features are:
主な特長：

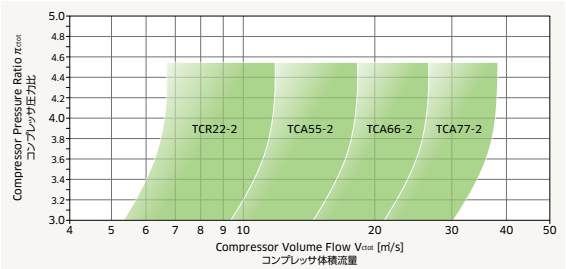
- ■ Increase of the compressor pressure ratio
  コンプレッサの圧力比増加
- ■ High efficiency
  高効率化
- ■ Simple installation to the engine
  容易な据付
- ■ Low noise emissions
  低騒音
- ■ Easy maintenance
  容易なメンテナンス
- ■ Long service life
  長寿命
- ■ VTA (option) can be applied
  オプションでVTA装備可能

Overall dimensions and weight / 主要寸法および重量

Type/型式	Length/長さ(mm)	Width/幅(mm)	Height/高さ(mm)	Mass/重量(kg)
TCR22	1,990	996	1,788	1,900
TCA55	2,439	1,371	1,819	3,300
TCA66	2,837	1,625	2,076	5,400
TCA77	3,416	1,930	2,397	9,300



Turbocharger application range / 過給機適用範囲 〈For two-stroke〉

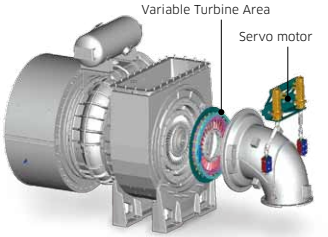


Turbocharger program / 過給機要目 〈For two-stroke〉

Type/型式	Max. Supercharged engine output/ 過給機関の最高出力(kW)*	Max. Turbine inlet temperature/ タービン入口最高許容温度(℃)
TCR22	6,200	650
TCA55	9,000	500
TCA66	13,000	500
TCA77	18,600	500

*: assumed specific air consumption le = 8 kg/kWh / 空気消費量 8kg/kWhを仮定
Note: Selection of turbocharger strongly depends on engine type and engine tuning. For detail information, please contact us. / 過給機型式は機関型式、機関チューニングに大きく影響されます。詳細はお問い合わせください。

VTA (Variable Turbine Area) / 可変タービン静翼

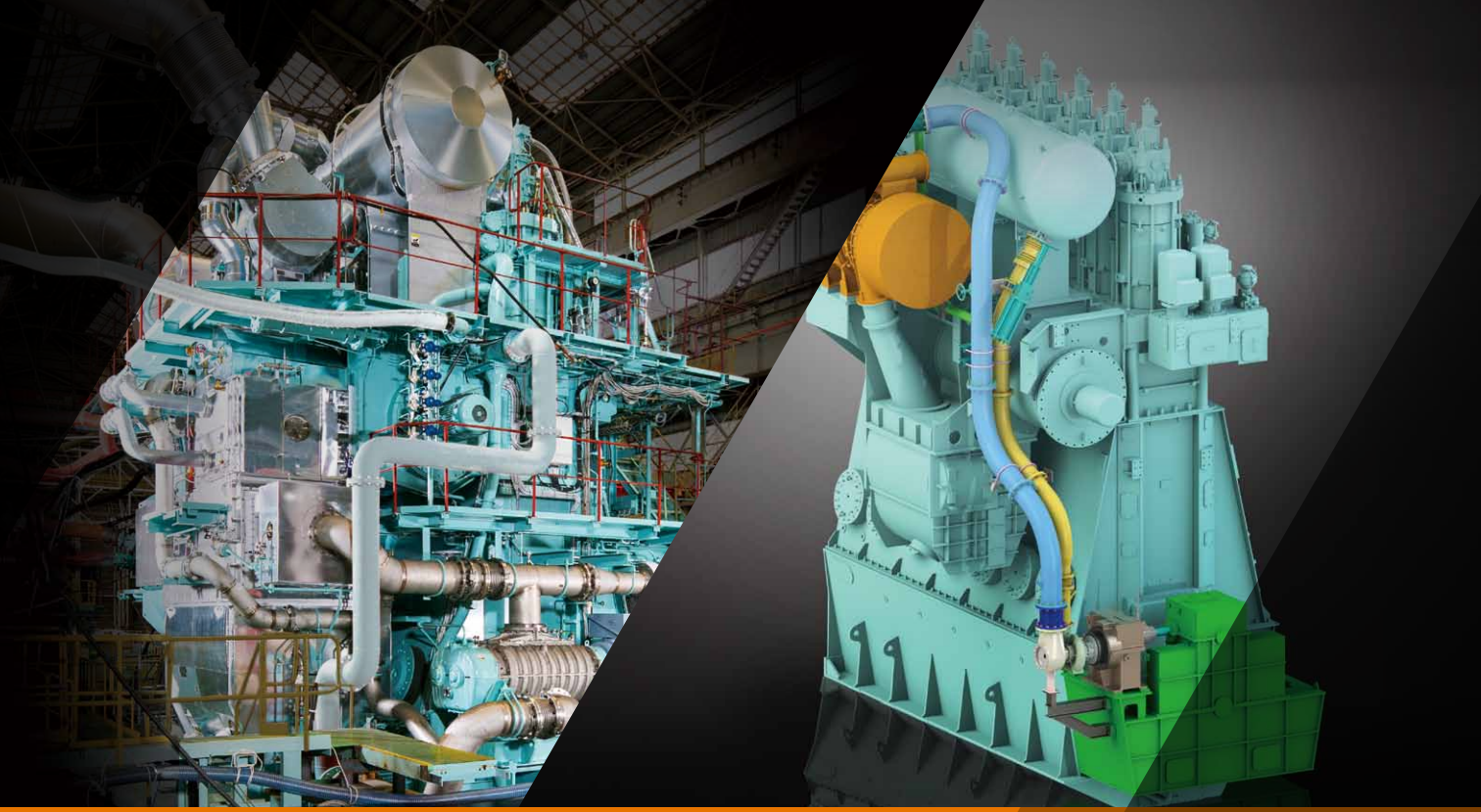


VTA makes it possible for diesel and gas engines to supply more appropriate combustion air pressure at each engine loads, then specific fuel oil consumption and emission of CO_2/HC will be reduced.

Close / 閉

Open / 開

タービン静翼角度に可変性をもたせることで、ディーゼル機関およびガスエンジンの各負荷における燃焼空気圧のより適切な設定が可能となり、燃費の向上とCO_2/HCなど排ガスを削減できます。



ECO-FRIENDLY PRODUCT

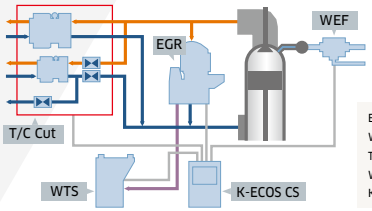
環境対応製品

Image:
Left/Kawasaki-ECO system "K-ECOS"
(Completed in May 2015)
Right/Kawasaki-Green Eco Turbine "K-GET"
(Completed in May 2014)

K-ECOS

The combined system with EGR and WEF to reduce NOx emission and T/C cut system to improve fuel oil consumption at part load is able to clear IMO NOx Tier Ⅲ and to achieve fuel saving and economical running.

NOx削減に効果的な「排気再循環システム(EGR)」と「水エマルジョン燃料(WEF)」、部分負荷で燃費を向上させる「過給機カットシステム」の最適な組み合わせにより、IMO NOx 3次規制をクリアし、低燃費・低ランニングコストを実現します。

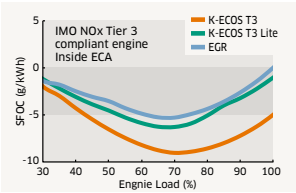


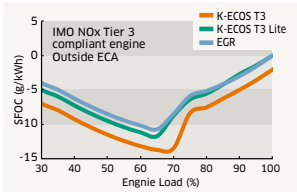
EGR: Exhaust Gas Recirculation
WEF: Water Emulsified Fuel
T/C Cut: Turbocharger Cut-out System
WTS: Waste Water Treatment System
K-ECOS CS: K-ECOS Control System

Fuel Saving 低燃費

K-ECOS T3 is able to achieve lower fuel oil consumption than EGR alone system both inside and outside ECA.

K-ECOS T3は、ECA内/外で排気再循環システム(EGR)の単独使用に比べて低燃費を実現します。





Application / アプリケーション

Component	EGR	WEF	T/C Cut	WTS	K-ECOS CS
K-ECOS T3	○	○	○	○	○
K-ECOS T3 Lite	○	—	○	○	○
K-ECOS T2	—	○	○	—	○

K-ECOS T3 For Tier Ⅲ engines
Possible fuel saving by NOx reduction of WEF compared to only EGR solution
水エマルジョン燃料とEGRの組み合わせによりEGR単体より低燃費を実現

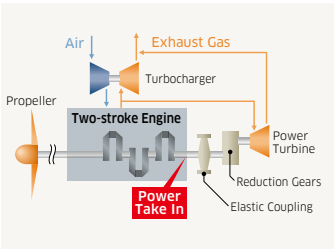
K-ECOS T3 Lite For Tier Ⅲ engines
Compact EGR and simplified WTS by using specified low sulfur fuel
低硫黄燃料に特化し、EGRの小型化と廃水処理システムの簡素化を実現

K-ECOS T2 For Tier Ⅱ engines
Fuel saving at part load by T/C Cut-out System and WEF compared to standard Tier Ⅱ engine
過給機カットと水エマルジョン燃料の併用でNOx 2次規制対応機関の燃費を大幅に低減

K-GET

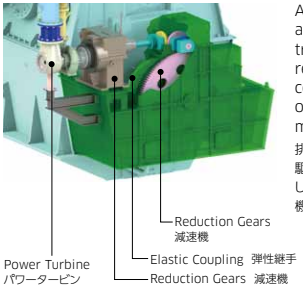
A part of exhaust gas energy is converted to shaft power by high efficiency power turbine which has been developed by Kawasaki. The system is designed compactly and is able to achieve lower fuel oil consumption.

排ガスエネルギーの一部を推進出力に還元するシステムです。自社開発の高効率パワータービンの使用により低燃費を実現したほか、機器構成をシンプルに設計しています。




K-GET on 6S50ME-B8

Simplified Structure 効率的でシンプルな構成



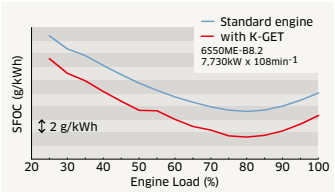
A part of exhaust gas energy drives a power turbine and the shaft power transmits to engine crankshaft via reduction gears. By simplifying configuration of equipment, impact on engine room layout is kept minimum.

排ガスエネルギーの一部でパワータービンを駆動、減速機を介して動力をクランク軸へ伝達します。機器構成をシンプルに設計したことで、機関室配置への影響を最小限にしています。

Fuel Saving 低燃費

K-GET is able to achieve lower fuel oil consumption than standard engine over all operating range.

K-GETを装備した機関は全運転範囲にわたって標準機関より低燃費を実現できます。



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KAWASAKI
GREEN GAS ENGINE
for Marine
川崎グリーンガスエンジン《船用》

Type Approved by
DNV·GL ClassNK

L30KG Series

ECOLOGICAL FRIENDLY
ENVIRONMENTALLY FRIENDLY
未来を見据えた環境負荷低減・低燃費

Kawasaki Green Gas Engine for marine, model L30KG series, pure gas engine,developed by original standout technology, can effectively reduce the amount of NOx, SOx and CO_2, and contributes to the improvement of global environment.

船用川崎グリーンガスエンジン、L30KGシリーズピュアガスエンジンは、川崎重工独自の卓越した技術により、船舶からのNOx、SOx、CO_2排出量を削減し、環境への負荷低減を実現します。

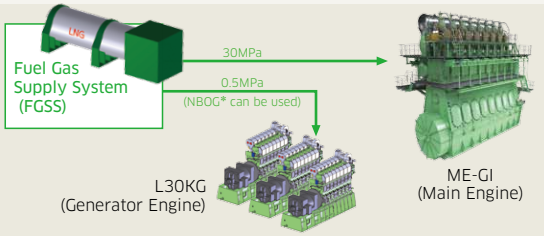
GREEN Gas Engines

Main Particulars / 主要目

		6L30KG	8L30KG	9L30KG
Bore	mm	300		
Stroke	mm	480		
Speed	min^{-1}	750		
Power[1)]	kW	2,670	3,560	4,005

1) Based on ISO3046. Without attached pumps.
ISO3046を基準に計測。潤滑油ポンプ・冷却水ポンプが機関駆動ではない場合の数値。

Application / アプリケーション



*NBOG : Natural Boil Off Gas / ナチュラルボイルオフガス