



BAB X

KESIMPULAN

X.I Kesimpulan

I. Untuk menentukan besarnya daya motor induk sebagai penggerak utama,

Maka factor kecepatan, daerah pelayaran dan ukuran utama rancangan mempunyai pengaruh yang sangat besar. Dengan ukuran utama mesin kapal sebagai berikut :

Merk	: MAN B&W DIESEL A/S
Type	: S26MC
Jumlah Silinder	: 5
Bore & Stroke	: 260 mm x 980 mm
Daya	: 2000 kW 2725 BHP
Putaran Mesin	: 250 rpm
Berat mesin	: 37 Ton
Konsumsi bahan bakar	: 179 gr/kW.h atau sama dengan 5,41 lt/menit
Dimensi	: 3460 x 1880 x 4825 (mm)



Kapal pembanding adalah BARUNA JAYA VIII

Dengan spek mesin sebagai berikut :

MAIN ENGINE / MESIN UTAMA

Jumlah	: 1 Unit
Merk	: CATERPILLAR
Model	: 3516 B WITH HEUI
Type	: 4 Stroke Cycle, Turbo Charger dan
After Cooler	
Engine Serial Number	: 8KN00198
Low Idle Speed	: 650 Rpm
Full Load Rpm	: 1600 Rpm
HI Idle Rpm	: 1732
Perf Spec	: 2T7848
Max Alt	: 1200 m
Fuel Timing	: 64 34
Power	: 2000 Hp / 1491 Kw
Rated Speed	: 1600 – 1925 Rpm
Modification No	:
AR NO OEM	: 100 – 8318
Full Load	: 20.8
Static Fuel Full Torq	: 22.3



Number of Cylinder	: 650 degree Vee 16
Bore	: 170 mm (6,7 Inch)
Stroke	: 190 mm (7,5 Inch)
Comprestion Ratio	: 13 : 5 : 1
Aspiration	: Thurbocharged (TA) with SCAC
Displacement / Cylinder total	: 4,31 (263 Cu Inch) - 69,11 (4210 Cu Inch)
Rotation	: CW Optimal
Injection Menthod	: Electronic Unit Injectors
Fuel	: See Fuel Specifications
Starting Menthod	: Air Motors
Exhaust system Design	: 2.5 kPa (10 inches of H2O)
Allowable Exhaust system Back Pressure	: 6.75 kPa (27 inches of H2O)
Max yang Diperbolehkan	: 5 kPa (20 inches of H2O)
Maximum Inlet system Restriction	: 6.2 kPa (25 inches of H2O)
Max yang Diperbolehkan	: 6.2 kPa (25 inches of H2O)
Air Cleaner	: Single or Two stage
Pabrik pembuatan	: USA

2. Pemilihan generator set ditentukan berdasarkan BKI 2009 Vol IV Section 14 C dimana kapasitas Generator harus dapat memberikan daya yang dibutuhkan untuk keperluan pelayanan mesin induk ,sistem keselamatan kapal dan penerangan serta pengkondisian udara yang nyaman.



Spesifikasi Generator set

Merk	= Cummins
Type	= KTA – 19G2
Daya Motor	= 318 kW
RPM	= 1500
Jumlah silinder	= 6
Cylinder (bore x stroke)	= 159 x 159
Jumlah	= 2 set

3. Untuk perencanaan daun baling baling maka ditentukan ukuran baling baling sebagai berikut :

- Type propeller berada pada : B4-85
- Diameter propeller (D) : 4,63
- Pitch Ratio propeller (Ho/D) : 0,7 :
- Developed Blade Ratio (Fa/F) : 0,85
- Effisiensi propeller (η_p) : 43%
- Jumlah daun propeller (Z) : 4

4. Dalam perencanaan kamar Mesin tidak terlepas dari adanya asumsi asumsi yang diberikan untuk mempermudah perhitungan dengan tidak mengabaikan tanggung jawab secara teknis, ekonomi serta peraturan peraturan yang ada sehingga hasil perhitungan dapat mendekati keadaan sebenarnya.

5. Pada kapal baruna jaya 8 sering terjadi kerusakan kerusakan yang bersifat umum diantara lain karena faktor usia kapal. Dan disini sering terjadi korosi pada mesin mesin atau pompa pompa, maka harus ada perawatan secara berkala dari teknisi



6. Pompa pompa di kapal baruna jaya 8 harus di cek bearingnya secara berkala khususnya, agar tidak terjadi keausan dan kebisingan pada pompa yang mengakibatkan kerusakan pada pompa.
7. Sering juga bermasalah pada sistem kelistrikannya juga, yang nota bene belum pernah diganti MCB nya.
8. Perbandingan antara kapal baruna jaya 7 dan 8 terletak pada segi pelayanan kapal, dan pembuatan kapal. Dimana baruna jaya 8 lebih modern dan sistem di kamar mesin lebih kompleks. Pembuatannya juga dari luar negeri/NORWEGIA.
9. Harapan kedepan dengan adanya kapal riset ini adalah menciptakan iklim pengetahuan Indonesia yang lebih maju, modern, dinamis dan bermartabat. Serta yang tak kalah pentingnya adalah sumbangsih riset sebagai Aset budaya bangsa.
10. Rumus Perhitungan Bull bows bow berdasarkan referensi buku Ship Design for Efficiency and Economy adalah $0,85 D$, diketahui nilai D sebesar $4,3$ m, nilai D dilihat dari Gambar kapal. Jadi Bull bows bow $0,85 \times 4,3 = 3,655$ m
11. Gear box yang dipakai dengan spesifikasi sebagai berikut
 - Merk : mekanord
 - Power factor : 2400 kW/rpm
 - Ratio : 2,03 : 1
 - Model : 500HS5000D



JURUSAN TEKNIK SISTEM PERKAPALAN

FAKULTAS TEKNOLOGI KELAUTAN

UNIVERSITAS DARMA PERSADA



DAFTAR PUSTAKA

1. Harvald,SV,Aa.Tahanan dan propulsi kapal,Airlangga University Press,edisi 1992
2. Principle of Naval Architecture hal 202
3. Elemen Mesin SOELARSO
4. (Dr.Ir. W. P. A. Van Lammern, “Resistance Propulsion and Steering of Ship”)
5. (BKI , Peraturan BKI vol. III Th. 1988)
6. (T. O’brien , The Design Of Marine Screw Propeller)
7. BKI VOLUME II
BKI vol.II section 9.1.1
BKI Vol. II section 11.2.1.1&2.
BKI Vol.II section 11.1 table 11.1
8. ship design and construction” oleh sname
9. aturan SOLAS 1978
10. BKI (Ref.No 6, Hal.10)
11. BKI Volume III
12. BKI 2009 vol III section 2H-2.10
13. BKI 2009 Vol. III section 11 G- 2.2.4
14. BKI 2009 VOL III section 11 G-4.4.3
15. BKI 2009 VOL III section 11 H-3.1.1
16. BKI 2009 VOL III section 11 K-4.1
17. BKI 2009 Vol III section II N-24,
18. BKI 2009 VOL III section 11N-3-4-6
19. BKI 2009 VOL III section 11Q-2
20. BKI 2009 Vol III section 12 N-1.2.3 dan table 12.2
21. BKI Vol III Section 11 - 25 Sub. 3,1
22. BKI 2009 VOL III section 11G.10.1-2
23. BKI 2009 VOL III section 11 l-5.1.1
24. BKI 2009 vol III section 12 E-2.3.1-2
25. BKI 2009 VOL III section 12E-1.1.1



26. BKI VOL IV
27. BKI 2009 Vol IV section 38-1.1-2
28. BKI 2009 VOL IV section 14 C-1.1-4.
29. BKI 2009 Vol IV Section 14 C
30. MARINE AUXILARY MACHINERY & SYSTEM, p 453
31. PEMBANDING BARUNA JAYA 8
32. Standart Amerika B36.10-1950 (CARBON STEEL)
33. Referensi diktat permesinan bantu unsada
34. profile NACA dan plat
35. “ Practical Ship Building “ oleh M. Khetagurof
36. FR.FASSMER & CO Untuk SEKOCI
37. M. Khetagurof (*Marine Auxiliary Machinery & System hal 310-312*)
38. Marine Engineering Hand Book
39. www.rentalac-indonesia.com
40. tabel R404a (Refrigeran & air conditioning)
41. Ship Design for Efficiency and Economy

INTERNET

- a. [www.masson gear box](http://www.masson-gear-box.com)
- b. [Jiangsu Province Qichuang Electric Power Equipment Manufacturing Co., Ltd.](http://www.jiangsu-qichuang.com)
- c. [Alpha Seismic Compressors, LLC](http://www.alpha-seismic.com)
- d. Alpha Seismic Compressors Air Source Solutions
- e. Tahap 1 - 100l min, Jerman dibuat - AlatSelam.com
- f. BKI Register
- g. Blower sentrifugal Fan, Blower Abc, 30 Hp SPI
- h. Centrifugal pumps Product information Taiko Kikai Industries
- i. CUMMINS 400KW Diesel Generator Set for Marine---Diesel Engine, Diesel Engine Parts, Generator set Exporter



- j. Fujita Electric Motor - Fujita Y2 motor listrik 3 phase - Indotara Hoist crane Indonesia, kargo angkat Jual, Barang angkat, pallet tangan, stacker tangan, udara komprehensif
- k. Gear pumps Product information Taiko Kikai Industries
- l. Genset Cummins Spesifikasi Genset Cummins Type Genset Cummins
- m. MARINE ENGINEERING Teknik Sistem Perkapalan Kaskus - The Largest Indonesian Community
- n. Pompa sentrifugal Informasi Produk Taiko Kikai Industries
- o. Rental AC-Sewa AC-Sewa Tenda-Misty Fan-Genzet - Perhitungan Beban Pendinginan Pada Perancangan Sistem Tata Udara
- p. Trojan L-16-RE-B 6V, 370AH (20HR) Premium Line Flooded Battery
- q. Turbo Blower BlueHeat Technology



Musa Casy

Donny Priyo Utomo

N: 2010320902
CAPAL Riset STZ PWT

Jgl. 13 Agustus
2013

embahasan :

P' Agustinus

Lay Out Kamar Mesin
- Pendudukan exhaust.

Penjelasan penempatan Gen-Set. (Bab IX)

Sistem Control AC.

Main Engine spesifikasi

Hal - 170. → SKI Vol IV th 1978. → kenapa tidak
terbaru? → untuk pemertayaan (E)

Penempatan exhaust / pendinginan untuk
kamar mesin.

Bahan bakar jenisnya.

Untuk Perawatan Mesin = nya.

kepala gambar harus seragam! (Bloknya).

Perhitungan Stern truster? harus dibuat!

Hal 120 → profil NACA, maksudnya?

Perhitungan Bul Bosh Bow dibuat!

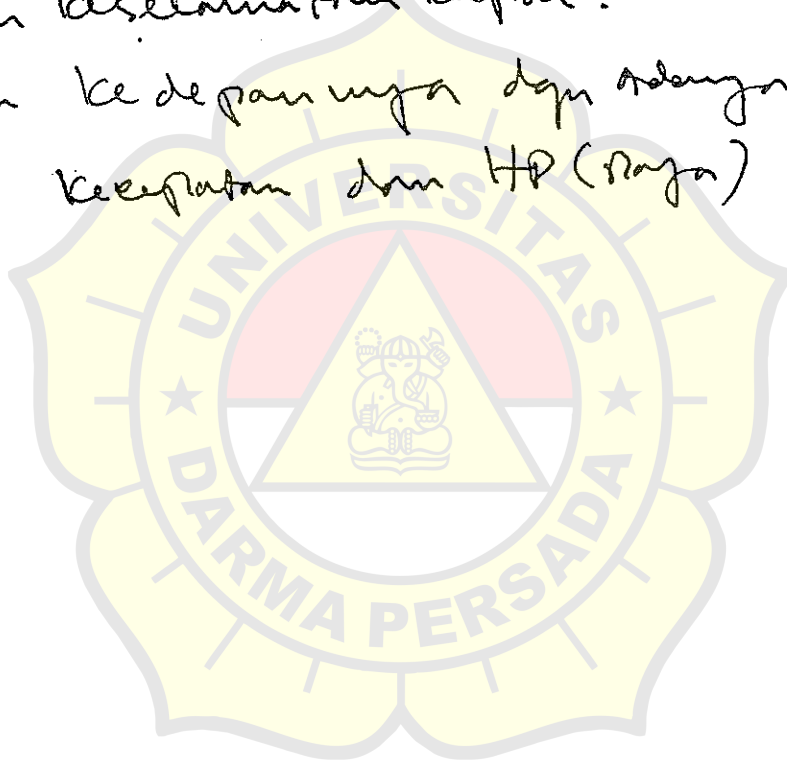
- Giras kope.

- Rencana Umum Hal - 50. Sumbernya dari mana?

- Propellernya → CPP apa bukan?

Danny

- Hal 71 → Referensi BKI th. 2009
- sering terjadi masalah
 - * kemisan → usia.
 - * korosi.
- Perawatan Bearing
- Sistem kelas tritannya kadang ber masalah.
- Perbandingan kapal RSJ VII & VIII.
- Peralatan keselamatan kapal.
- Harapan kedepannya dgn adanya kapal Riset.
- Kurva kecepatan dan HP (Horsepower) dibuat?
-



Aryan

Caterpillar → spek mesin.

Sistem udara start disesuaikan dgn Spee rpm.

Hal 179, sistem kalistrikan (Sepa Gen Set).

Spee Cummins yg disesuaikan dgn bahan bakar.

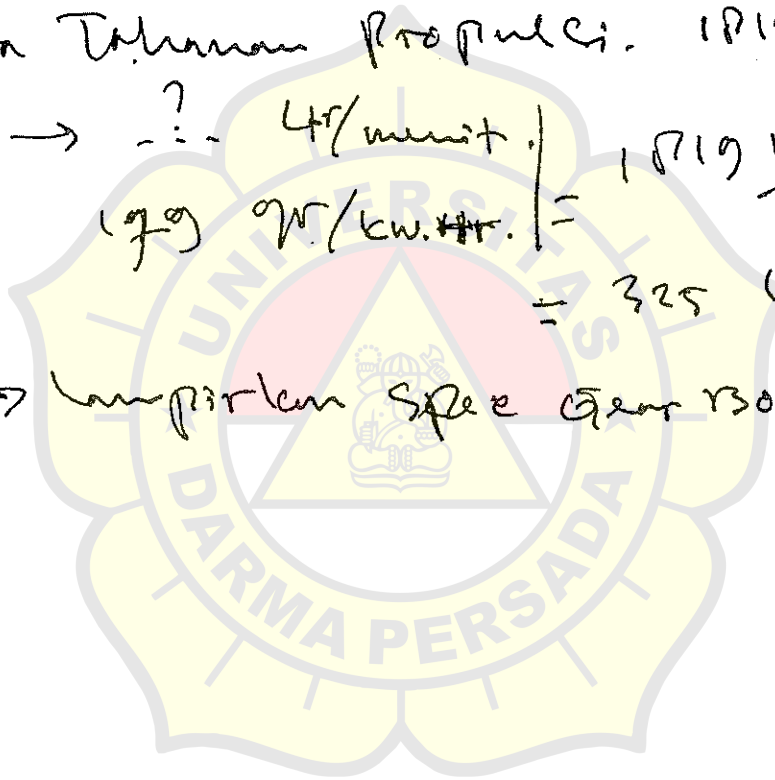
kel 104, konsumsi bahan bakar.

Dalga pada Tolokan Propulsi. 1819 kw.

$$1819 \text{ kw} \rightarrow \dots \text{ 4r/menit.} \quad \left| \quad \frac{1819 \text{ kw} \times 79 \text{ gr}}{\text{kwH}} \right.$$

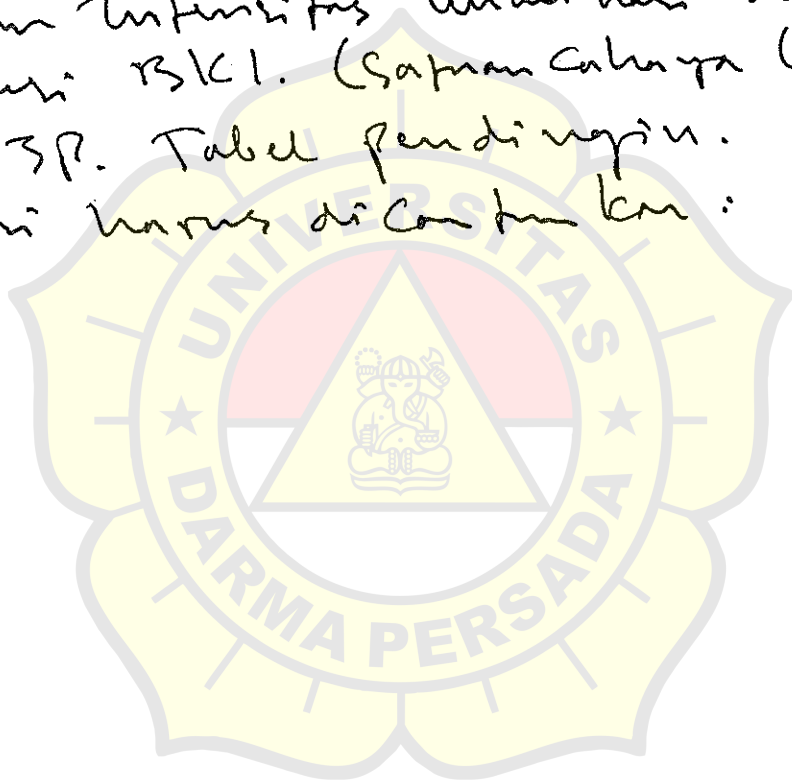
$$\left. \frac{179 \text{ gr}}{\text{kw.Hr.}} \right| = 325 \text{ 4/r} = 5,41 \frac{\text{4}}{\text{min}}$$

Hal 23 → lampirkan Spee Gear Box!



1115 :

- Hal 15. Perhitungan GHP → harus ada referensi
- Di tulis ulang hal. 15.
- Penjelasan kavitas.
- Hal 93 - 94 → kompresor seri's mic.
- Hal 95. Pipa hisap, apakah bahan bakar-
nilainya di perkirakan?
- Hal 130. Padam Ventilasi. temperaturanya?
- Pedoman Intensitas Uraian neri Cahaya.
Referensi BKL. (Satuan Cahaya Luxen).
- Hal 137. Tabel pendingin.
Referensi harus di cantumkan :



ClassNK
ISO 9001

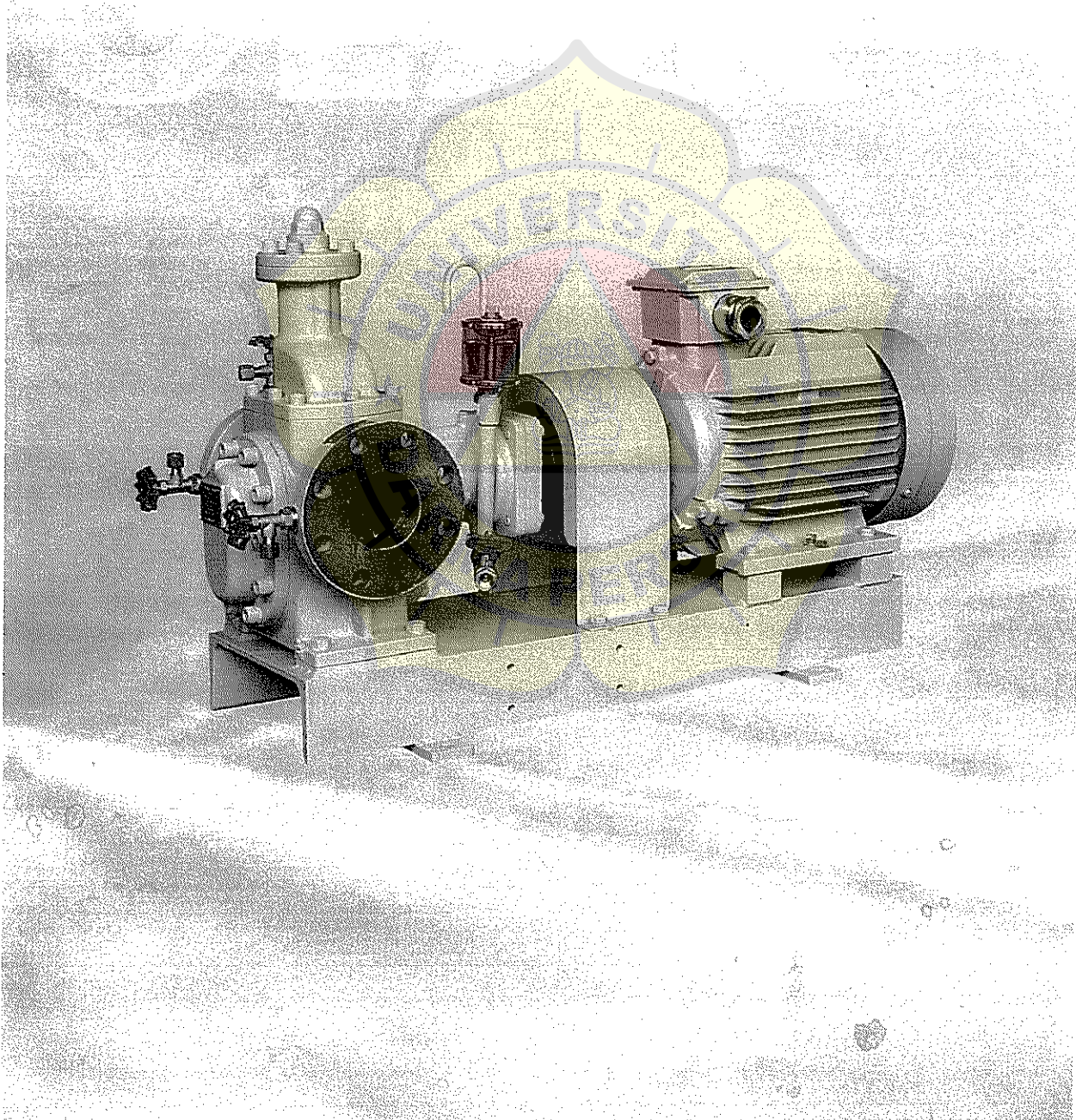


ClassNK
ISO 9001



TAIKO

GEAR PUMP HHC



大晃機械工業株式会社
TAIKO KIKAI INDUSTRIES CO., LTD.

特長

Feature

HHCシリーズは、
一般電動横形中圧内装軸受式
歯車ポンプです。

HHC series is motor driven horizontal
medium pressure internal bearing type
gear pumps. The pump series is
applied for F.O.CIRC. PUMP generally.

- 歯 形：世界にさきがけて考案された、
一点連続接触歯車"欠円ギヤー"が
標準です。
※HHC-1～2：インボリュート歯車

- Tooth Profile : To be the first in the world to design a one-point-contact-gear called "Segmental Gear" as our standard model.
※HHC-1to 2 : Involute Gear

仕様

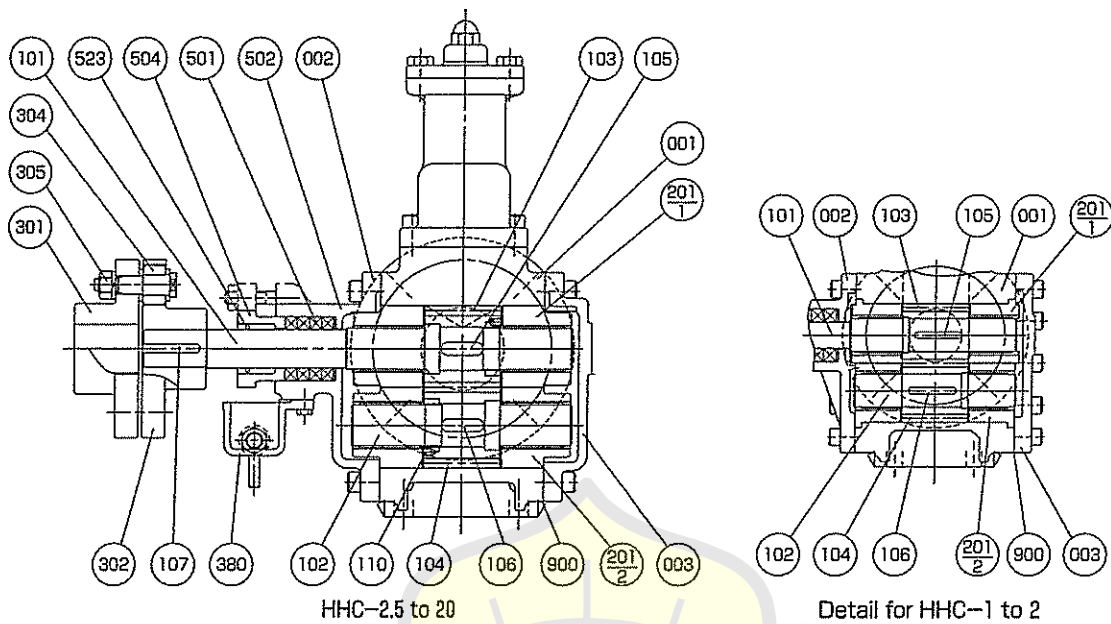
Specification

- 温 度：取扱い油温は最高150℃です。
■ Temperature : Maximum handling oil temperature is 150℃.
- 軸 受：内装軸受式で揚液による自己潤滑方式のため、潤滑性を有する液に適しています。
■ Bearing : Internal bearing is self-lubricated by pumping liquid which is suitable to serve lubricant fluids.
- 軸 封：メカニカルシール式が標準です。軸封箱にオイルクエンチングを設けています。グランドパッキンも製作いたします。
■ Shaft Seal : The mechanical seal is our standard. Oil quenching is provided in the shaft seal box. The conventional gland packing is also available.
- フランジ：吸込JIS10K、吐出しJIS16Kです。
■ Flange : Suction is JIS10K. Discharge is JIS16K.
- 軸 心：ポンプと電動機との軸継手の芯の振れの許容範囲は、回転速度2000～500min⁻¹において、軸継手側面で0.1mm以下、軸継手端面で0.1mm以下です。
■ Centering : If connecting the pump with the motor, the allowable alignment value at the rate of 2000 to 500min⁻¹ at the shaft coupling side surface should be under 0.1mm and at the shaft coupling end surface should be under 0.1mm.
- 水圧試験：計画仕様圧力の2倍が標準です。最高3.20MPaです。
■ Hydraulic Test : Twice the value of the designed specification pressure with a maximum value of 3.20MPa.
- 吐出し量：吐出し量は、吐出圧力1.6MPa、粘度25.8mm²/sにおける量です。許容吸込圧力範囲は、ポンプ入口において、-0.05～0.60MPaです。
■ Capacity : The following capacity shows at viscosity of 25.8mm²/s with total pressure of 1.60MPa. The allowable suction pressure range is -0.05 to 0.60MPa at the pump suction.

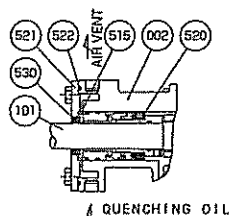
形 番 Model No.	口径 Bore (mm) 吸込×吐出し Suc.× Dis.	吐出し量 Capacity (m ³ /h)	
		60Hz 1200min ⁻¹	50Hz 1000min ⁻¹
HHC-1MA	32×25	1	0.8
HHC-1.5MA	40×32	1.5	1.2
HHC-2MA		2	1.6
HHC-2.5MA	50×40	2.5	2
HHC-3MA		3	2.5
HHC-4MA	65×50	4	3.3
HHC-5MA		5	4
HHC-6MA		6	5
HHC-7.5MA	80×65	7.5	6
HHC-10MA		10	8
HHC-12MA		12	9.6
HHC-15MA		15	12
HHC-20MA		20	16

構造及び材質

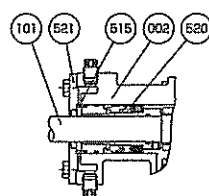
Structure and Material



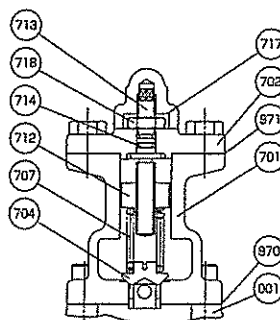
No.	Name	Material			No.	Name	Material		
		Symbol	Name of Material	Qty			Symbol	Name of Material	Qty
001	ケーシング Casing	FC200	Cast iron	1	504	グランド Gland	AC4C-T6	Al-alloy casting	1
002	サイドカバー Side cover	FC200	Cast iron	1	515	スペーサリング Spacer ring	S45C	Carbon steel	1
003	サイドカバー Side cover	FC200	Cast iron	1	520	メカニカルシール Mechanical seal	-	T.C & carbon	1
101	主動軸 Drive shaft	SCM440H	Cr-Mo STEEL	1	521	メカニカルシールカバー Seal cover	SS400	Mild steel	1
102	従動軸 Driven shaft	SCM440H	Cr-Mo STEEL	1	522	Oリング O-ring	FPM	Rubber	1
103	主動歯車 Drive gear	S45C	Carbon steel	1	523	Oリング O-ring	FPM	Rubber	1
104	従動歯車 Driven gear	S45C	Carbon steel	1	530	オイルシール Oil seal	FPM	Rubber	1
105	キー Key	S45C	Carbon steel	1	701	逃し弁本体 Safety v.box	FC200	Cast iron	1
106	キー Key	S45C	Carbon steel	1	702	逃し弁カバー Safety v.cover	S45C	Carbon steel	1
107	キー Key	S45C	Carbon steel	1	704	逃し弁 Safety valve	SUS410	Stainless steel	1
110	歯車締付ナット Gear set ring	S45C	Carbon steel	2	706	弁座 Safety v.seat	CAC402	Bronze	1
201/1	ベアリングメタル Bearig metal	(WJ1)	(White metal)	2	707	逃し弁ばね Safety v.spring	SWP6 or SUP6	Piano wire or Spring steel	1
201/2		S25C	Carbon steel	2	712	ばね押さえ Spring carrier	SS400	Mild steel	1
301	軸継手 Coupling	FC200	Cast iron	1	713	調整ねじ Adjust screw	SS400	Mild steel	1
302	軸継手 Coupling	FC200	Cast iron	1	714	Oリング O-ring	FPM	Rubber	1
304	軸継手用リング Coupling ring	NBR	Rubber	4	717	キャップ Safety v.cap	FC200	Cast iron	1
305	軸継手用ボルト、ナット Coupling bolt&nut	SS400	Mild steel	4	718	ロックナット Lock nut	SS400	Mild steel	1
380	油受皿 Oil pan	FC200	Cast iron	1	900	ガスケット Gasket	-	Paper	2
501	グランドパッキン Gland packing	-	Carbonized fiber	4	970	ガスケット Gasket	-	Paper	1
502	テフロンリング Teflon ring	PTFE	Teflon	1	971	ガスケット Gasket	-	Paper	1



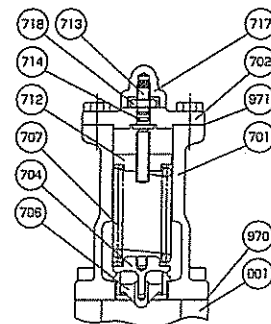
HHC-00MA



HHC-00MN



HHC-1 to 2



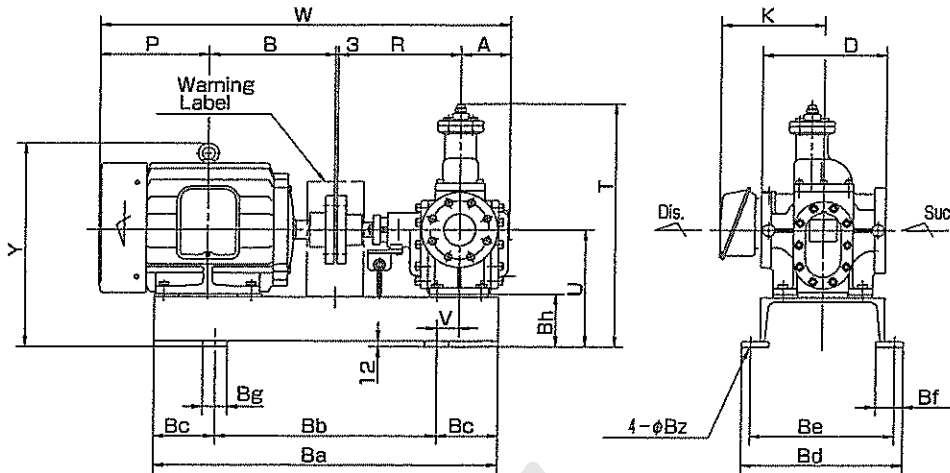
HHC-2.5 to 20

メカニカルシール詳細
Detail for Mechanical Seal

逃し弁詳細
Detail for Safety Valve

寸法

Dimension



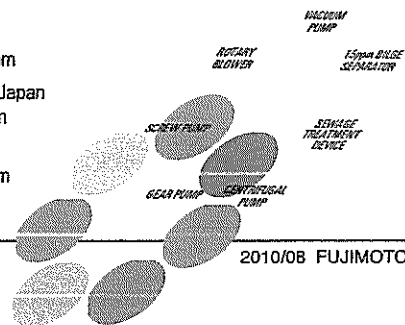
形番 Model No.	電動機 Motor (kW)	寸法 Dimensions (mm)																	質量 Weight (kg)			軸継手 Coupling						
		A	B	D	K	P	R	S	T	U	V	W	Y	Ba	Bb	Bc	Bd	Be	Bf	Bg	Bh		Bz	ポンプ Pump	台座 Base	電動機 Motor		
HHC-1MA	0.75	80	188.5	200	160	143		220	3	385	210	35	615	307		600	400	100	275	240	55	50	110	15	16	18	19	A-125
	1.5		193		165	148.5							665	348												17	31	
HHC-1.5MA HHC-2MA	0.75	85	168.5	200	160	143		220	3	385	210	35	620	307		600	400	100	275	240	55	50	110	15	17	18	19	A-125
	1.5		193		165	148.5							670	348												17	31	
HHC-2.5MA HHC-3MA	0.75	100	200	240	175	176		250	3	460	240	45	715	378		700	450	125	325	290	55	50	108	15	28	28	31	A-125
	1.5		200		175	176							729	397												27	41	
HHC-4MA	2.2	100	200	250	175	176		250	3	470	240	45	729	397		700	450	125	325	290	55	50	108	15	30	26	58	A-140
	3.7		239		190	207.5							800	413												27	41	
HHC-5MA	2.2	105	239	250	190	207.5		250	3	500	240	45	805	413		700	450	125	325	290	55	50	108	15	30	26	58	A-140
	3.7		258		190	226.5							848	413												27	41	
HHC-6MA	2.2	110	239	250	190	207.5		250	3	500	240	45	810	413		700	450	125	325	290	55	50	108	15	30	26	58	A-140
	3.7		258		190	226.5							848	413												27	41	
HHC-7.5MA	2.2	110	239	280	190	207.5		250	3	540	270	45	810	443		700	450	125	325	290	55	50	110	15	45	29	58	A-140
	3.7		258		190	226.5							848	443												37	105	
HHC-10MA HHC-12MA	5.5	130	258	280	265	252		320	3	575	270	65	900	443		800	500	150	325	290	55	50	110	15	48	33	58	A-160
	7.5		282		265	252							1028	483		900	550	175	390	350	65	60	110	19	48	38	105	
HHC-15MA	11	145	345		265	274						75	1087	483		1000	600	200							19	41	130	A-180
	15		370.5		290	313.5		320	3	595	290	75	1119	547		1000	600	200	390	350			110	19	60	60	170	
HHC-20MA	15	150	351.5	320	290	284.5		320	3	605	300	75	1119	547		1000	600	200	470	430	65	60	120	19	60	60	170	A-180
	18.5		370.5		290	313.5							1157	547												60	200	

※電動機メーカー及び形番によりW、K寸法及び質量は異なります。
 Depend on motor manufacturer and model, measurement of W, K and weight maybe changed.

大晃機械工業株式会社 TAIKO KIKAI INDUSTRIES CO., LTD.

URL <http://www.taiko-kk.com>

- 本 社 営 業 部 〒742-1598 山口県熊毛郡田布施町大字下田布施209-1
 TEL: (0820)52-3114 FAX: (0820)53-1001 E-mail: business@taiko-kk.com
- 東 京 支 店 〒101-0061 東京都千代田区三崎町3-4-9 水道橋MSビル4階
 TEL: (03)3221-8551 FAX: (03)3221-8555 E-mail: tokyo-br@taiko-kk.com
- 大 阪 支 店 〒541-0048 大阪市中央区瓦町3-4-7 KCビル8階
 TEL: (06)6231-6241 FAX: (06)6222-3295 E-mail: osaka-br@taiko-kk.com
- 北京駐在事務所・上海駐在事務所・韓国大晃
- Head Office 209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi Pref. 742-1598 Japan
 TEL: 81-820-52-3114 FAX: 81-820-53-1001 E-mail: business@taiko-kk.com
- Tokyo Branch 4th floor, Suidobashi MS Building, 3-4-9 Misaki-cho, Chiyoda-ku, Tokyo 101-0061 Japan
 TEL: 81-3-3221-8551 FAX: 81-3-3221-8555 E-mail: tokyo-br@taiko-kk.com
- Osaka Branch 8th floor, KC Building, 3-4-7 Kawara-machi, Chuo-ku, Osaka 541-0048 Japan
 TEL: 81-6-6231-6241 FAX: 81-6-6222-3295 E-mail: osaka-br@taiko-kk.com
- Beijing Office · Shanghai Office · Taiko Korea



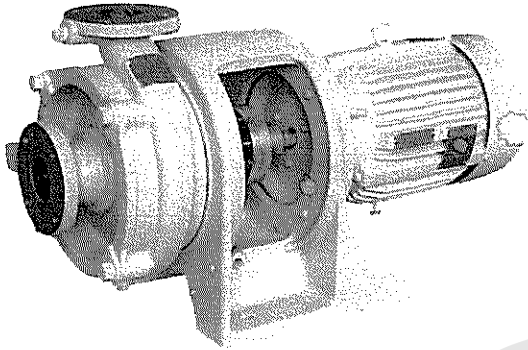
ISO9001の認証取得 御問い合わせの詳細は別紙【BUSINESS OFFICE NETWORK】を御覧ください。
 ISO9001 certified For any inquiries, please refer to attached 【BUSINESS OFFICE NETWORK】
 ●このカタログに記載した製品は性能向上のため予告なしに寸法及び仕様を変更することがあります。
 ●The sizes and specifications of the products in this catalog are subject to improvement.

2010/08 FUJIMOTO



CENTRIFUGAL PUMP

TMC



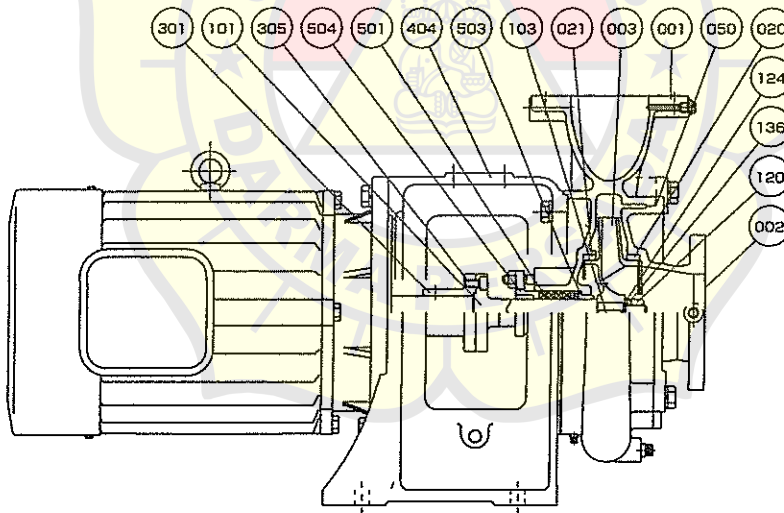
Application

Cooling Fresh Water
Cooling Sea Water
Sea Water Service

Feature

Horizontal Single-stage Single-suction
Closed Coupling Type

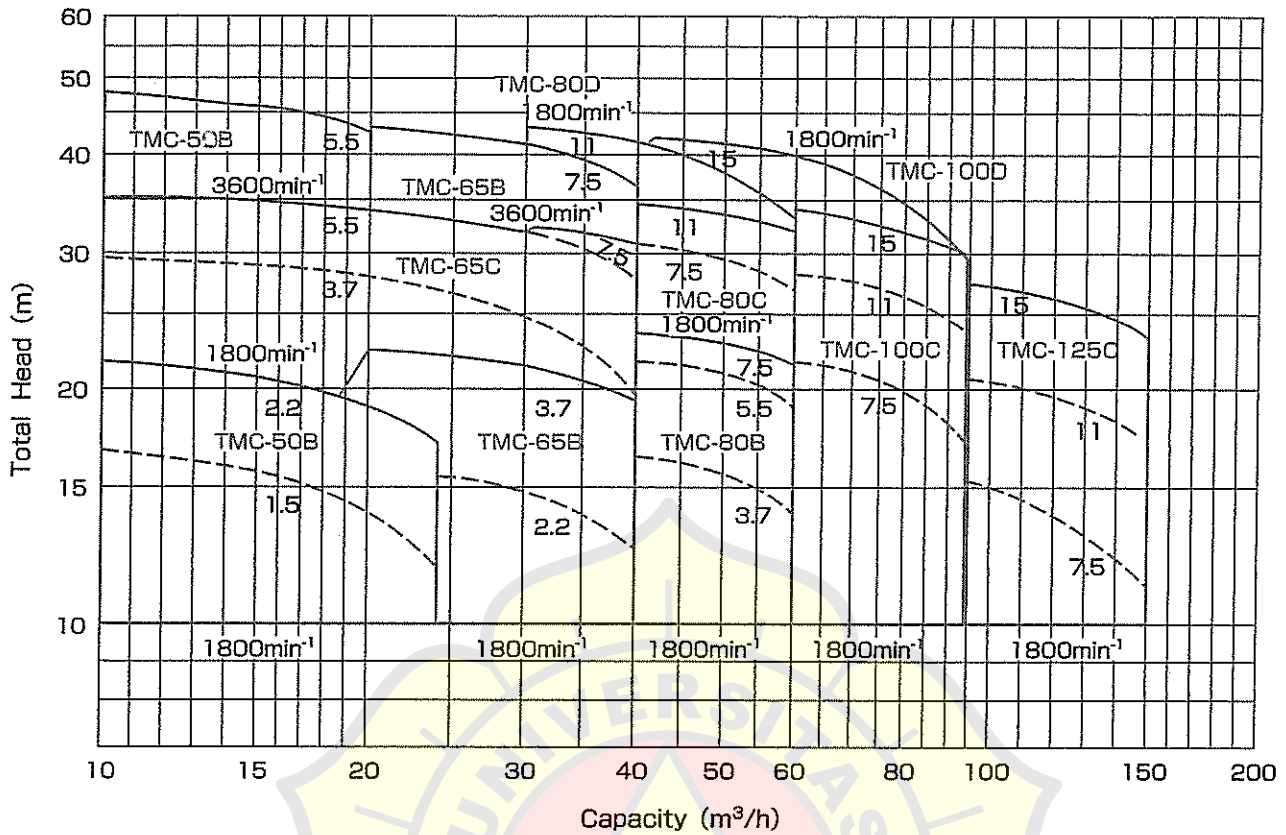
Structure & Material



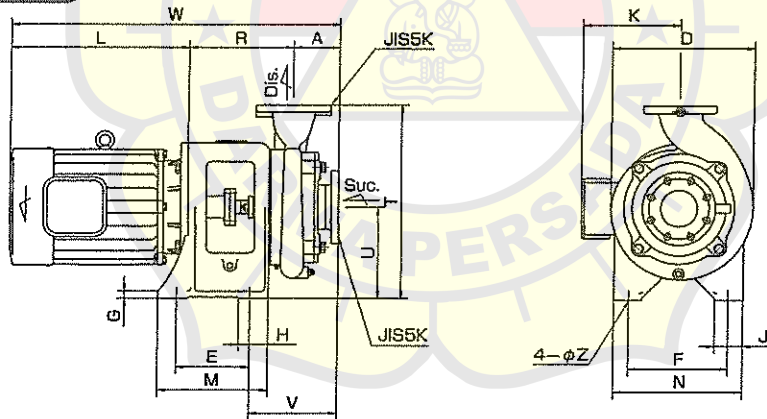
Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
001	CASING	1	BRONZE	CAC402	CAST IRON	FC200
002	CASING COVER	1	BRONZE	CAC402	CAST IRON	FC200
003	IMPELLER	1	PHOSPHOR BRONZE	CAC502A	PHOSPHOR BRONZE	CAC502A
020	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
021	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
050	O-RING	1	RUBBER	NBR	RUBBER	NBR
101	SHAFT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
103	IMPELLER KEY	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
120	IMPELLER NUT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304

Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
124	IMPELLER WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
136	SPRING WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
301	COUPLING	1	MILD STEEL	SS400	MILD STEEL	SS400
305	COUPLING BOLT	4	Cr-Mo STEEL	SCM435	Cr-Mo STEEL	SCM435
404	FRAME	1	CAST IRON	FC200	CAST IRON	FC200
501	GLAND PACKING	4	CARBONIZED FIBER	—	CARBONIZED FIBER	—
503	LANTERN RING	1	BRONZE	CAC402	BRONZE	CAC402
504	GLAND	1	BRONZE	CAC402	BRONZE	CAC402

Performance



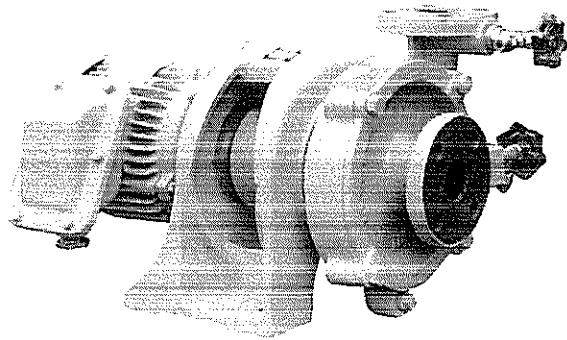
Dimension



Model No.	Motor		Bore		Dimension (mm)																
	kW	min ⁻¹	Suc.	Dis.	A	D	E	F	G	H	J	K	L	M	N	R	T	U	V	W	Z
TMC-50B	1.5	1800	50	50	100	265	150	220	15	80	65	195	300	250	280	215	370	190	205	615	16
	2.2	1800					180	270	18			205	330	280	225	225	210	655			
	5.5	3600					200	270	18			265	400	300	330	245	390	210		745	
TMC-65B	2.2	1800	65	65	100	285	180	220	18	80	65	205	330	280	280	227	390	190	207	657	15
	3.7	1800					215	355				265	400	300	330	247	410	210		747	
	7.5	3600					265	400				300	330	247	410	210	747				
TMC-65C	3.7	1800	65	65	100	335	180	220	18	80	65	215	355	280	280	227	415	190	207	682	15
	5.5	1800					200	270				265	400	300	330	247	435	210		747	
	7.5	1800					200	270				265	400	300	330	247	435	210		747	
TMC-80B	3.7	1800	80	80	100	325	180	220	18	80	65	215	355	280	280	232	415	190	212	687	15
	5.5	1800					200	270				265	400	300	330	252	435	210		752	
	7.5	1800					200	270				265	400	300	330	252	435	210		752	
TMC-80C	7.5	1800	80	80	100	365	200	270	18	80	75	265	400	300	350	252	500	250	212	752	19
	11	1800					20	270	20			285	485	282	282	500	250	867			
TMC-80D	11	1800	80	80	125	405	200	270	20	80	75	285	485	300	350	290	530	250	245	900	19
	7.5	1800					20	270	20			285	485	282	282	530	250	778			
TMC-100C	11	1800	100	100	125	385	200	270	20	80	75	285	485	300	350	283	530	250	238	833	19
	15	1800					20	270	20			285	525	283	283	250	933				
	7.5	1800					20	270	20			265	400	265	265	250	805				
TMC-100D	15	1800	100	100	125	405	200	270	20	80	75	285	525	300	350	290	565	250	245	940	19
	7.5	1800					20	270	20			265	400	265	265	250	805				
TMC-125C	11	1800	125	125	140	420	200	270	20	80	75	285	485	300	350	295	530	250	265	920	19
	15	1800					20	270	20			285	525	295	295	250	960				
	7.5	1800					20	270	20			265	400	265	265	250	805				



CENTRIFUGAL PUMP TMC (TMV)



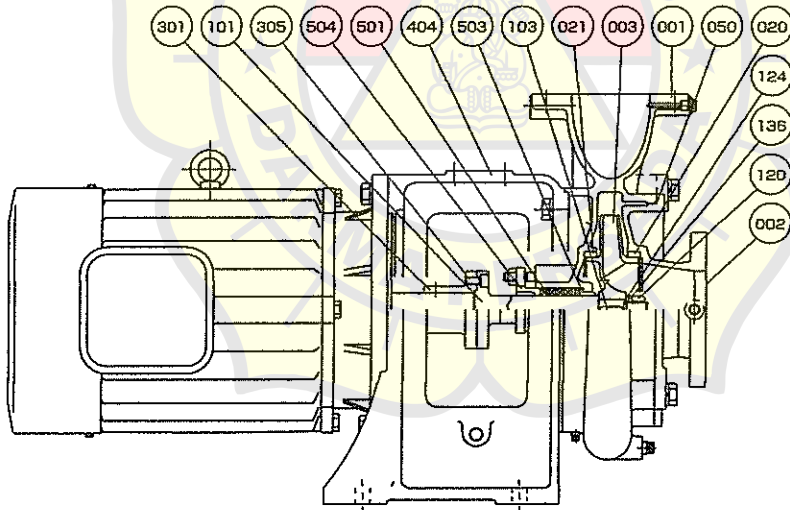
Application

- Fresh Water Pump
- Sanitary Pump
- Drinking Water Pump

Features

- Horizontal Single-stage Single-suction
- Closed-coupling Type

Exploded View of the Pump

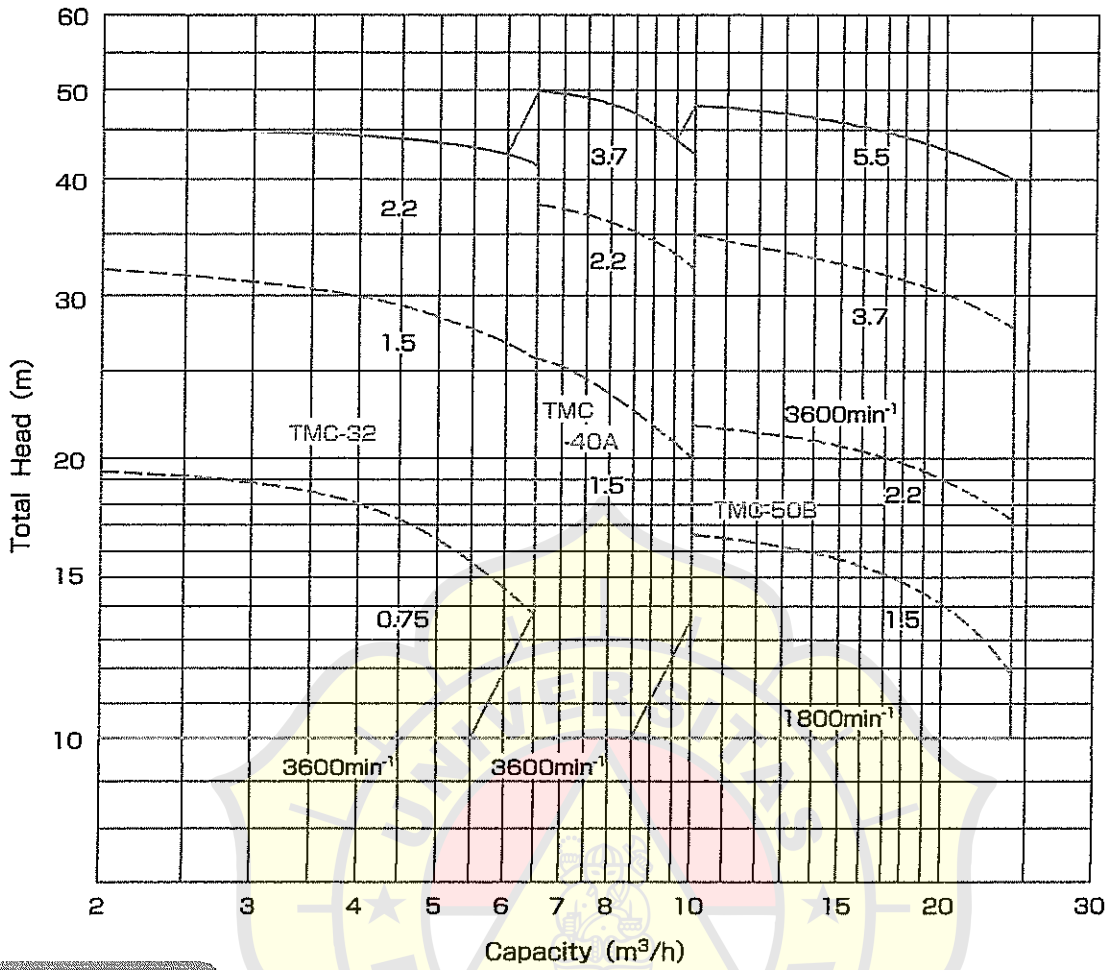


Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
01	CASING	1	BRONZE	CAC402	CAST IRON	FC200
02	CASING COVER	1	BRONZE	CAC402	CAST IRON	FC200
03	IMPELLER	1	PHOSPHOR BRONZE	CAC502A	PHOSPHOR BRONZE	CAC502A
20	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
21	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
50	O-RING	1	RUBBER	NBR	RUBBER	NBR
31	SHAFT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
33	KEY	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
20	IMPELLER NUT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304

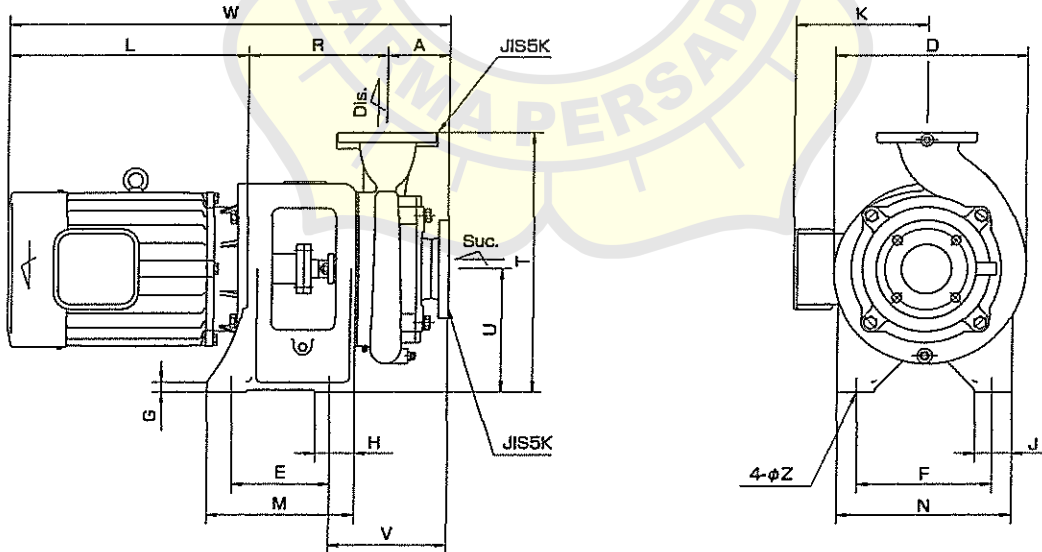
Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
124	IMPELLER WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
136	SPRING WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
301	COUPLING	1	MILD STEEL	SS400	MILD STEEL	SS400
305	COUPLING BOLT	4	Cr-Mo STEEL	SCM435	Cr-Mo STEEL	SCM435
404	PUMP FRAME	1	CAST IRON	FC200	CAST IRON	FC200
501	GLAND PACKING	4	CARBONIZED FIBER	-	CARBONIZED FIBER	-
503	LANTERN RING	1	BRONZE	CAC402	BRONZE	CAC402
504	GLAND	1	BRONZE	CAC402	BRONZE	CAC402



Performance



Dimension

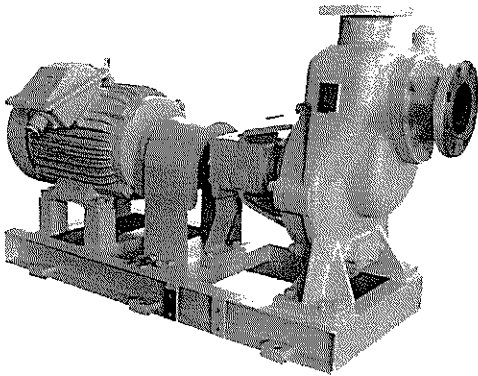


Model No.	Motor		Bore		Dimension (mm)																
	kW	min ⁻¹	Suc.	Dis.	A	D	E	F	G	H	J	K	L	M	N	R	T	U	V	W	Z
TMC-32	0.75	3600	32	32	82	270	120	160	15	50	65	173	260	180	220	160	280	140	156	502	12
	1.5						140	180													
	2.2						140	180													
TMC-40A	1.5	3600	40	40	80	205	140	180	15	50	65	188	302	200	250	175	320	160	160	557	12
	2.2						212	368													
	3.7						212	368													
TMC-50B	1.5	1800	50	50	100	265	150	220	15	80	65	188	302	250	280	215	370	190	205	627	15
	2.2						197														
	3.7	212					368														
	5.5	245					375														



CENTRIFUGAL PUMP

EHS



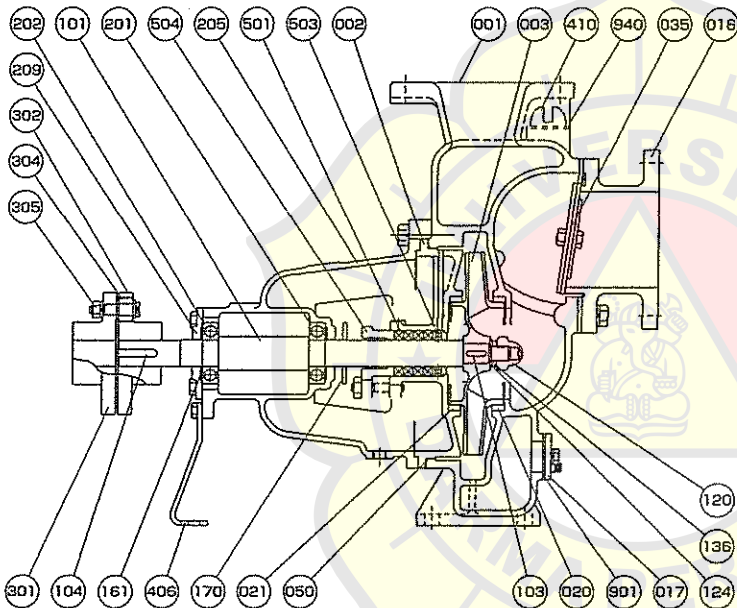
Application

Fire & G.S. Pump
Bilge & Ballast Pump

Feature

Horizontal Single-stage Single-suction
Self-priming Type

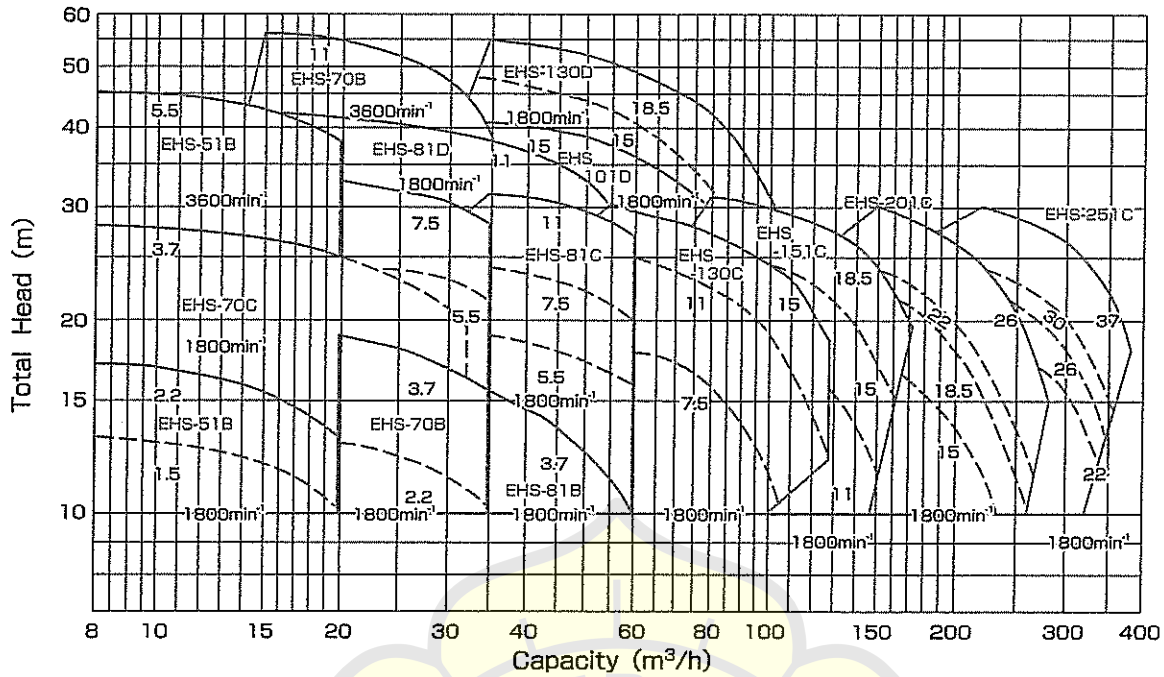
Structure & Material



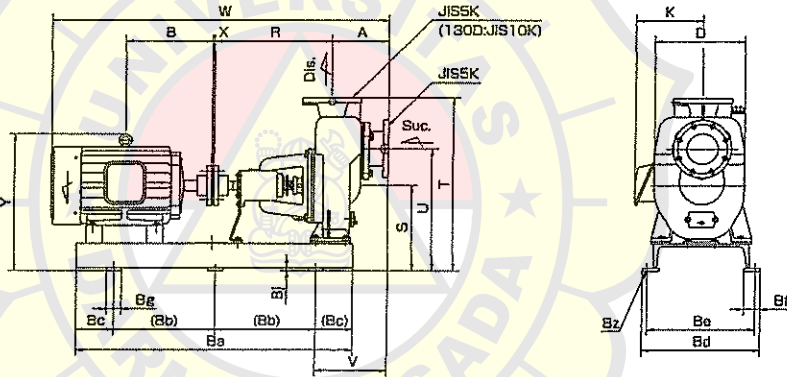
Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
001	CASING	1	BRONZE	CAC402	CAST IRON	FC200
002	CASING COVER	1	BRONZE	CAC402	CAST IRON	FC200
003	IMPELLER	1	PHOSPHOR BRONZE	CAC502A	PHOSPHOR BRONZE	CAC502A
016	SUCTION COVER	1	BRONZE	CAC402	CAST IRON	FC200
017	DRAIN COVER	1	BRONZE	CAC402	CAST IRON	FC200
020	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
021	CASING RING	1	BRONZE	CAC402	BRONZE	CAC402
035	CHECK VALVE	1	RUBBER / BRONZE	NBR / CAC402	RUBBER / BRONZE	NBR / CAC402
050	O-RING	1	RUBBER	NBR	RUBBER	NBR
101	SHAFT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
103	KEY	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
104	KEY	1	CARBON STEEL	S45C	CARBON STEEL	S45C
120	IMPELLER NUT	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
124	IMPELLER WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
136	SPRING WASHER	1	STAINLESS STEEL	SUS304	STAINLESS STEEL	SUS304
161	RETAINING RING	1	SPRING STEEL	SUP6	SPRING STEEL	SUP6

Part No.	Name	Req. No.	Sea Water		Fresh Water	
			Material	JIS	Material	JIS
170	FLINGER	1	RUBBER	NBR	RUBBER	NBR
201	BALL BEARING	1	BEARING STEEL	SUJ2	BEARING STEEL	SUJ2
202	BALL BEARING	1	BEARING STEEL	SUJ2	BEARING STEEL	SUJ2
205	BEARING HOUSING	1	CAST IRON	FC200	CAST IRON	FC200
209	BEARING COVER	1	CAST IRON	FC200	CAST IRON	FC200
301	COUPLING	1	CAST IRON	FC200	CAST IRON	FC200
302	COUPLING	1	CAST IRON	FC200	CAST IRON	FC200
304	COUPLING RING	8	RUBBER	NBR	RUBBER	NBR
305	COUPLING BOLT&NUT	8	MILD STEEL	SS400	MILD STEEL	SS400
406	SUPPORT	1	MILD STEEL	SS400	MILD STEEL	SS400
410	PRIMING CAP	1	BRONZE	CAC402	BRONZE	CAC402
501	GLAND PACKING	4	CARBONIZED FIBER	-	CARBONIZED FIBER	-
503	LANTERN RING	1	BRONZE	CAC402	BRONZE	CAC402
504	GLAND	1	BRONZE	CAC402	BRONZE	CAC402
901	GASKET	1	RUBBER	NBR	RUBBER	NBR
940	GASKET	1	RUBBER	NBR	RUBBER	NBR

Performance



Dimension



Model No.	Motor		Bore		Dimension (mm)																					
	kW	min ⁻¹	Suc.	Dis.	A	B	D	K	R	S	T	U	V	W	X	Y	Ba	Bb	Bc	Bd	Be	Bf	Bg	Bi	Bz	
EHS-51B	1.5	1800	50	50	168.5	189	178	254	189	355	270	538	380	238	867	3	365	700	450	125	325	290	55	60	12	4-φ15
	2.2	193			375	914											375	50								
	5.5	3600			239	245											428	800	500	150	60					
EHS-70B	2.2	1800	65	65	193	197	188	262	197	355	270	538	380	248	924	3	375	700	450	125	325	290	55	50	12	4-φ15
	3.7	200			416	800											500	150	60							
	11	3500			323	285											500	1000	700	150	390	350	65	60	4-φ19	
EHS-70C	3.7	1800	65	65	200	212	188	313	212	355	290	585	430	248	944	3	436	800	500	150	390	350	65	60	12	4-φ15
	5.5	239			944	900											550	175	60							
	7.5	258			1038	900											550	175	60	4-φ19						
EHS-81B	3.7	1800	80	80	230	200	230	276	212	365	290	585	400	300	996	3	436	800	500	150	390	350	65	60	12	4-φ15
	5.5	239			1132	60																				
	7.5	1800			80	80											205	256	337	245	470	320	670	470	265	1171
EHS-81C	11	323	285	550	1100	400	60																			
	7.5	1800	80	80	205	256	337	245	470	320	670	470	265	1171	3	478	1000	350	150	470	430	65	60	12	6-φ19	
	11	323	285	550	1100	400	60																			
EHS-81D	11	1800	80	80	215	323	215	384	285	470	345	720	520	275	1296	3	575	1100	400	150	470	430	65	60	12	6-φ19
	15	345			1348	60																				
	7.5	1800			100	100											225	345	400	285	470	370	745	545	285	1348
EHS-101D	15	1800	100	100	225	345	225	400	285	470	370	745	545	285	1348	3	500	1100	400	150	470	430	65	60	12	6-φ19
	7.5	258			245	1191											503	1000	350	60						
	15	323			358	285											470	345	700	495	285	1305	3	575	1100	400
EHS-130C	11	1800	125	125	225	323	225	358	285	470	345	700	495	285	1305	3	575	1100	400	150	470	430	65	60	12	6-φ19
	15	345			1348	60																				
	15	1800			125	100											280	345	416	285	575	370	770	545	340	1508
EHS-130D	18.5	351.5	330	575	370	770	545	340	1508	1520	630	60														
	11	323	1386	60																						
	15	1800	150	150	285	345	353	285	470	345	720	520	345	1408	3	575	1100	400	150	470	430	65	60	12	6-φ19	
EHS-151C	18.5	351.5	330	575	370	770	545	340	1508	1520	630	60														
	15	345	1448	600																						
	15	1800	200	200	325	351.5	400	330	470	370	810	570	385	1460	3	630	1100	400	150	470	430	65	60	12	6-φ19	
EHS-201C	18.5	351.5	330	575	370	770	545	340	1508	1520	630	60														
	22	370.5	1498	1200	450																					
	26	345	285	575	370	770	545	340	1508	1520	630	60														
EHS-251C	22	351.5	330	575	370	770	545	340	1508	1520	630	60														
	26	370.5	1498	1200	450																					
	30	351.5	1530	1200	450	150	550	500	65	60	25	6-φ19														
EHS-251C	37	425.5	345	530	430	960	660	365	1658	1650	4	705	1300	500	150	550	500	65	60	25	6-φ19					

ClassNK 
ISO 9001 

ClassNK 
ISO 9001 

TAIKO

GEAR PUMP VG



大晃機械工業株式会社
TAIKO KIKAI INDUSTRIES CO., LTD.

特長

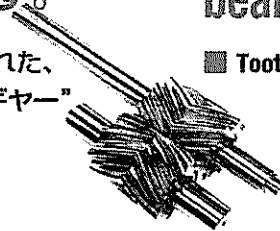
Feature

VGシリーズは、
一般電動立形低圧・
内装軸受式歯車ポンプです。

VG series is motor driven
vertical low pressure internal
bearing type gear pumps.

- 歯 形：世界にさきがけて考案された、
一点連続接触歯車“欠円ギヤー”
が標準です。

- Tooth Profile : To be the first in the world to design a
one-point-contact-gear called
“Segmental Gear” as our standard
model.



仕様

Specification

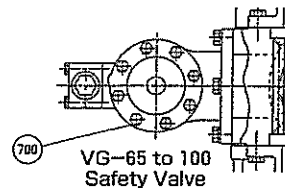
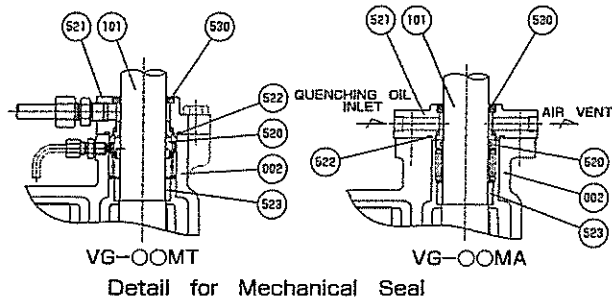
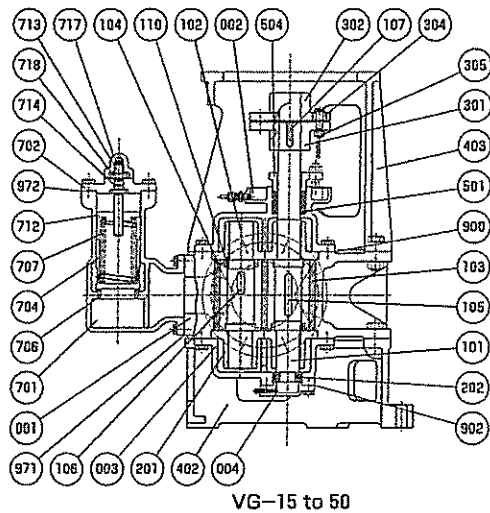
- 温 度：取扱い油温は、最高80℃です。
- 軸 受：内装軸受式で揚液による自己潤滑方式
のため、潤滑性を有する液に適します。
- 軸 封：グランドパッキン式が標準です。
ご要望に応じて、メカニカルシール式を
製作します。
- フランジ：吸込、吐出し共JIS10Kです。
- 軸 心：ポンプと電動機との軸継手の芯の振れの
許容範囲は、回転速度2000~500min⁻¹
において、軸継手側面で0.1mm以下、
軸継手端面で0.1mm以下です。
- 水圧試験：計画仕様圧力の2倍が標準です。
最高1.20MPaです。
- 吐出し量：吐出し量は、吐出し圧力0.60MPa、粘度
25.8mm²/sにおける量です。
許容吸込圧力範囲は、ポンプ入口におい
て、-0.05~0.20MPaです。

- Temperature : Maximum handling oil temperature is
80℃.
- Bearing : Internal bearing is self-lubricated by
pumping liquid which is suitable to
serve lubricant fluids.
- Shaft Seal : The conventional gland packing is our
standard; however, the mechanical
seal type is also available.
- Flange : Both suction and discharge is JIS10K.
- Cantering : If connecting the pump with the motor,
the standard allowable alignment
value at the rate of 2000 to 500min⁻¹
at the shaft coupling side surface
should be under 0.1mm and at the
shaft coupling end surface should be
under 0.1mm.
- Hydraulic Test : Twice the value of the designed specifi-
cation pressure with a maximum value
of 1.20MPa.
- Capacity : The following capacity shows at viscosity
of 25.8mm²/s with discharge
pressure of 0.60MPa.
The allowable suction pressure range
is -0.05 to 0.20MPa at the pump suction.

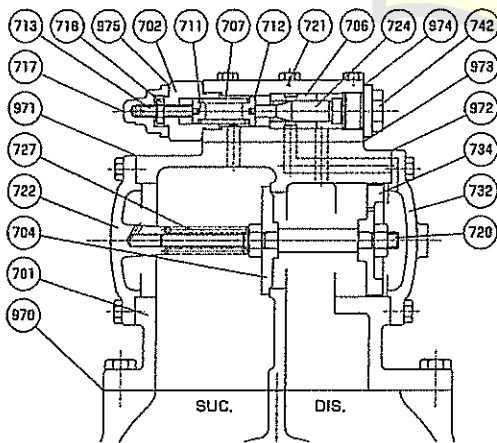
形 番 Model No.	口径 Bore (mm) 吸 込×吐出し Suc.×Dis.	吐出し量 Capacity (m ³ /h)			
		60Hz		50Hz	
		1200min ⁻¹	900min ⁻¹	1000min ⁻¹	750min ⁻¹
VG-15	100×80	15		12	
VG-20		20		16	
VG-25		25		20	
VG-30	125×100	30		25	
VG-35		35		29	
VG-40		40		33	
VG-50	150×125	50		40	
VG-65			65		55
VG-80			80		65
VG-90			90		75
VG-100			100		85
	200×150				

構造及び材質

Structure and Material



No.	Name		Material		Q'ty	No.	Name		Material		Q'ty
	Symbol	Name of Material	Symbol	Name of Material			Symbol	Name of Material	Symbol	Name of Material	
001	ケーシング	Casing	FC200	Cast iron	1	520	メカニカルシール	Mechanical seal	-	SiC & Carbon or Ceramic & Carbon	1
002	サイドカバー	Side cover	FC200	Cast iron	1	521	メカニカルシールカバー	Mech.seal cover	FC200	Cast iron	1
003	サイドカバー	Side cover	FC200	Cast iron	1	522	Oリング	O-ring	NBR	Rubber	1
004	エンドカバー	End cover	FC200	Cast iron	1	523	調整リング	Spacer	SS400	Mild steel	1
101	主動軸	Drive shaft	S45C	Carbon steel	1	530	オイルシール	Oil seal	NBR	Rubber	1
102	従動軸	Driven shaft	S45C	Carbon steel	1	700	逃し弁完備品	Safety v.complete	-	-	1
103	主動歯車	Drive gear	S45C	Carbon steel	1	701	逃し弁本体	Safety v.box	FC200	Cast iron	1
104	従動歯車	Driven gear	S45C	Carbon steel	1	702	逃し弁カバー	Safety v.cover	FC200	Cast iron	1
105	キー	Key	S45C	Carbon steel	1	704	逃し弁	Safety valve	S45C	Carbon steel	1
106	キー	Key	S45C	Carbon steel	1	706	弁座	Safety v.seat	SUS410	Stainless steel	1
107	キー	Key	S45C	Carbon steel	1	707	逃し弁ばね	Safety v.spring	SUP6	Spring steel	1
110	歯車摺付ナット	Gear set ring	S45C	Carbon steel	2	712	ばね押さえ	Spring carrier	SS400	Mild steel	1
201	平軸受	Bearing metal	CAC603 or FC200+WAJ1	Lead bronze or Cast iron+White metal	4	713	調整ねじ	Adjust screw	SS400	Mild steel	1
202	スラスト玉軸受	Thrust ball bearing	SUJ2	Bearing steel	1	714	Oリング	O-ring	NBR	Rubber	1
301	軸継手	Coupling	FC200	Cast iron	1	717	キャップ	Safety v.cap	FC200	Cast iron	1
302	軸継手	Coupling	FC200	Cast iron	1	718	ロックナット	Lock nut	SS400	Mild steel	1
304	軸継手用リング	Coupling ring	NBR	Rubber	8	900	ガスケット	Gasket	-	Paper	2
305	軸継手用ボルト	Coupling bolt	SS400	Mild steel	8	902	ガスケット	Gasket	-	Paper	1
402	ポンプ台	Pump bed	FC200	Cast iron	1	971	ガスケット	Gasket	-	Paper	1
403	フレーム	Frame	FC200	Cast iron	1	972	ガスケット	Gasket	-	Paper	1
501	グランドパッキン	Gland packing	-	Carbonized fiber	4						
504	グランド	Gland	CAC402	Bronze	1						



Parts No.700:Safety V.Complete
VG-65 to 100

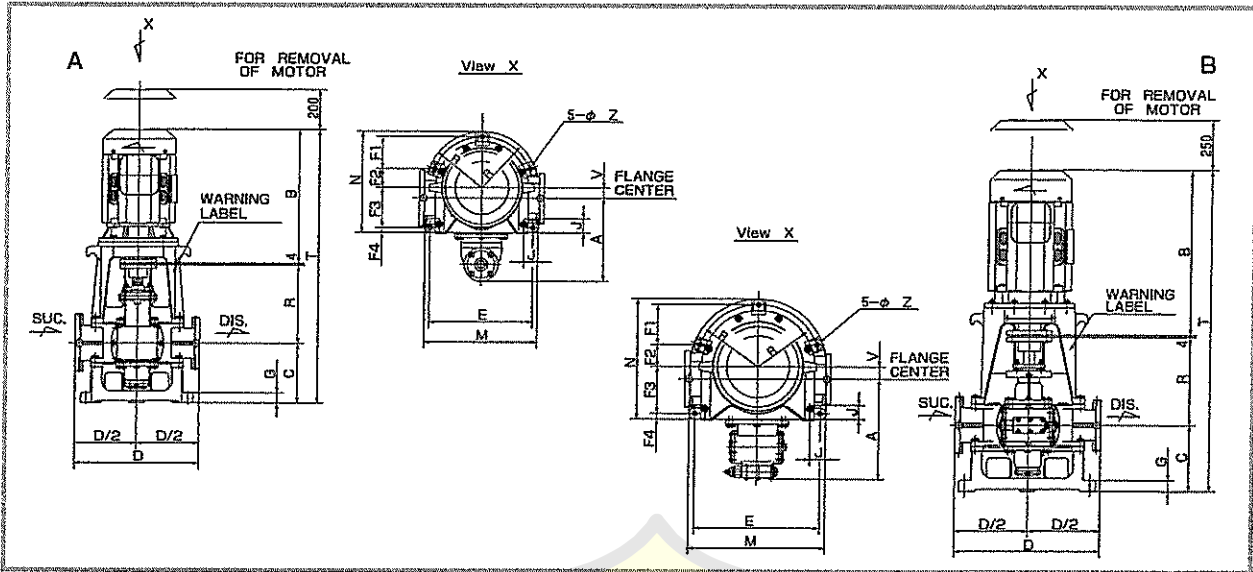
No.	Name		Material		Q'ty
	Symbol	Name of Material	Symbol	Name of Material	
701	逃し弁本体	Safety v.box	FC200	Cast iron	1
702	逃し弁カバー	Safety v.cover	SS400	Mild steel	1
704	逃し弁	Safety valve	S45C	Carbon steel	1
706	弁座	Safety v.seat	CAC402	Bronze	1
707	逃し弁ばね	Safety v.spring	SWPA	Piano wire	1
711	ばね押さえ	Spring carrier	SS400	Mild steel	1
712	ばね押さえ	Spring carrier	SS400	Mild steel	1
713	調整ねじ	Adjust screw	SS400	Mild steel	1
717	キャップ	Safety v.cap	FC200	Cast iron	1
718	ロックナット	Lock nut	SS400	Mild steel	1
720	ピストン棒	Piston rod	S45C	Carbon steel	1
721	逃し弁本体	Safety v.box	FC200	Cast iron	1
722	逃し弁カバー	Safety v.cover	FC200	Cast iron	1
724	逃し弁	Safety valve	SUS410	Stainless steel	1
727	逃し弁ばね	Safety v.spring	SWPA	Piano wire	1
732	逃し弁カバー	Safety v.cover	FC200	Cast iron	1
734	ピストン弁	Piston valve	S45C	Carbon steel	1
742	逃し弁カバー	Safety cover	FC200	Cast iron	1
970	ガスケット	Gasket	-	Paper	1
971	ガスケット	Gasket	-	Paper	1
972	ガスケット	Gasket	-	Paper	1
973	ガスケット	Gasket	-	Paper	1
974	ガスケット	Gasket	-	Paper	2
975	ガスケット	Gasket	-	Paper	1

NOTICE

This safety valve is not a pressure regulating valve.
If required, please install a pressure regulating valve or bypass valve on the line.

寸法

Dimension



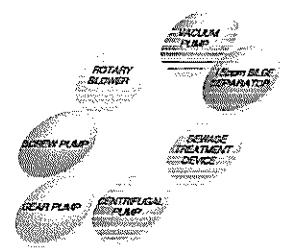
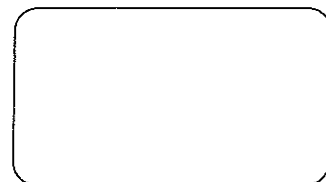
形番 Model No.	図 fig.	電動機 Motor		寸法 Dimension (mm)																	質量 Weight (kg)		軸継手 Coupling		
		出力 Output (kW)	極数 Pole No.	A	B	C	D	E	F1	F2	F3	F4	G	J	K	M	N	D	R	T	V	Z		ポンプ Pump	電動機 Motor
VG-15 20 25	A	5.5	6	320	570	253	500	400	125	75	150	25	40	50	225	450	400	200	345	1172	45	23	220	86	A-160
		7.5		638	1240															115					
		7.5		638	1252															115					
VG-30 35	A	11.0	6	320	638	265	500	400	125	75	150	25	40	50	225	450	400	200	345	1252	45	23	230	130	A-160
		11.0		678	1292															130					
VG-40	A	15.0	6	400	678	300	620	510	160	95	200	25	50	70	280	560	505	255	390	1372	53	23	340	130	A-180
		15.0		732	1426															180					
VG-50	A	15.0	6	400	732	290	620	510	160	95	200	25	50	70	280	560	505	255	390	1416	53	23	350	180	A-180
		18.5		770	1454															250					
VG-65	B	18.5	8	495	868	330	720	620	200	110	235	30	55	70	335	670	600	310	445	1647	62	24	500	340	A-200
		22.0		868	1667															340					
VG-80	B	22.0	8	495	960	350	720	620	200	110	235	30	55	70	335	670	600	310	445	1759	62	24	500	530	A-224
		30.0		960	1759															530					
VG-90	B	22.0	8	495	868	350	720	620	200	110	235	30	55	70	335	670	600	310	445	1667	62	24	500	340	A-224
		30.0		960	1759															530					
VG-100	B	30.0	8	525	960	417	780	680	215	125	250	30	60	80	370	740	650	340	515	1896	70	28	750	530	A-250

※電動機メーカー及び形番によりT.B寸法及び質量が異なります。
 Depend on motor manufacturer and model, measurement of T.B and weight maybe changed.

大晃機械工業株式会社 TAIKO KIKAI INDUSTRIES CO., LTD.

URL <http://www.taiko-kk.com>

- 本 社 ・ 工 場 〒742-1598 山口県熊毛郡田布施町大字下田布施209-1
 TEL: (0820) 52-3113~4 FAX: (0820) 53-1001 E-mail: business@taiko-kk.com
- 東 京 支 店 〒101-0061 東京都千代田区三崎町3-4-9 水道橋MSビル4階
 TEL: (03) 3221-8551 FAX: (03) 3221-8555 E-mail: tokyo-br@taiko-kk.com
- 大 阪 支 店 〒541-0048 大阪市中央区瓦町3-4-7 KCビル8階
 TEL: (06) 6231-6241 FAX: (06) 6222-3295 E-mail: osaka-br@taiko-kk.com
- 北京駐在事務所・上海駐在事務所・韓国大晃
- Head Office & Factory 209-1 Shimotabuse, Tabuse-cho, Kumage-gun, Yamaguchi pref. 742-1598 Japan
 TEL: 81-820-52-3113~4 FAX: 81-820-53-1001 E-mail: business@taiko-kk.com
- Tokyo Branch 4th floor, Suidobashi MS Building, 3-4-9 Misaki-cho, Chiyoda-ku, Tokyo 101-0061 Japan
 TEL: 81-3-3221-8551 FAX: 81-3-3221-8555 E-mail: tokyo-br@taiko-kk.com
- Osaka Branch 8th floor, KC Building, 3-4-7 Kawara-machi, Chuo-ku, Osaka 541-0048 Japan
 TEL: 81-6-6231-6241 FAX: 81-6-6222-3295 E-mail: osaka-br@taiko-kk.com
- Beijing Office・Shanghai Office・Taiko Korea



■ ISO 9001の認定取得 お問い合わせ先の詳細は別紙【BUSINESS OFFICE NETWORK】をご覧ください。
 ■ ISO 9001 certified For any inquiries, please refer to attached 【BUSINESS OFFICE NETWORK】
 ● このカタログに記載した製品は性能向上のため予告なしに寸法及び仕様を変更することがあります。
 ● The sizes and specifications of the products in this catalog are subject to improvement.

2010/11 MUTSUMI

2 SERIES MOTOR TECHNICAL DATA

Model	Output		Voltage (V)	Current (A)	Speed (r.p.m)	Eff (%)	Power factor	Start torque Rated torque	Start current Rated current	Max torque Rated torque	Min torque Rated torque
	HP	KW									
380V 50Hz Synchronous Speed 3000 r/min (2 poles)											
Y2-6312	0.24	0.18	380	0.53	2800	65	0.80	2.2	5.5	2.2	1.6
Y2-6322	0.33	0.25	380	0.69	2800	68	0.81	2.2	5.5	2.2	1.6
Y2-7112	0.50	0.37	380	0.99	2800	70	0.81	2.2	6.1	2.2	1.6
Y2-7122	0.75	0.55	380	1.40	2800	73	0.82	2.2	6.1	2.3	1.6
Y2-8012	1	0.75	380	1.80	2825	75	0.83	2.2	6.1	2.3	1.5
Y2-8022	1.5	1.1	380	2.58	2825	77	0.84	2.2	7.0	2.3	1.5
Y2-90S-2	2	1.5	380	3.39	2840	79	0.84	2.2	7.0	2.3	1.5
Y2-90L-2	3	2.2	380	4.85	2840	81	0.85	2.2	7.0	2.3	1.4
Y2-100L-2	4	3	380	6.31	2880	83	0.87	2.2	7.5	2.3	1.4
Y2-112M-2	5.5	4	380	8.13	2890	85	0.88	2.2	7.5	2.3	1.4
Y2-132S1-2	7.5	5.5	380	11.0	2900	86	0.88	2.2	7.5	2.3	1.2
Y2-132S2-2	10	7.5	380	14.9	2900	87	0.88	2.2	7.5	2.3	1.2
Y2-160M1-2	15	11	380	21.3	2930	88	0.89	2.2	7.5	2.3	1.2
Y2-160M2-2	20	15	380	28.8	2930	89	0.89	2.2	7.5	2.3	1.2
Y2-160L-2	25	18.5	380	34.7	2930	90	0.90	2.2	7.5	2.3	1.1
Y2-180M-2	30	22	380	41.0	2940	90.5	0.90	2.0	7.5	2.3	1.1
Y2-200L1-2	40	30	380	55.5	2950	91.2	0.90	2.0	7.5	2.3	1.1
Y2-200L2-2	50	37	380	67.9	2950	92	0.90	2.0	7.5	2.3	1.1
Y2-225M-2	60	45	380	81	2950	92.3	0.90	2.0	7.5	2.3	1.0
Y2-250M-2	75	55	380	99.6	2950	92.5	0.90	2.0	7.5	2.3	1.0
Y2-280S-2	100	75	380	133.3	2950	93	0.90	2.0	7.5	2.3	0.9
Y2-280M-2	120	90	380	158.2	2950	93.8	0.91	2.0	7.5	2.3	0.9
Y2-315S-2	150	110	380	195.1	2950	94	0.91	1.8	7.1	2.2	0.9
Y2-315M-2	176	132	380	231.6	2950	94.5	0.91	1.8	7.1	2.2	0.9
Y2-315L1-2	213	160	380	279.6	2950	94.6	0.92	1.8	7.1	2.2	0.9
Y2-315L2-2	267	200	380	347.7	2950	94.8	0.92	1.8	7.1	2.2	0.8
Y2-355M-2	336	250	380	429.4	2950	95.3	0.92	1.6	7.1	2.2	0.8
Y2-355L-2	420	315	380	538.9	2950	95.6	0.92	1.6	7.1	2.2	0.8
380V 50Hz Synchronous Speed 1500 r/min (4 poles)											
Y2-6314	0.16	0.12	380	0.44	1400	57	0.72	2.1	4.4	2.2	1.7
Y2-6324	0.24	0.18	380	0.62	1400	60	0.73	2.1	4.4	2.2	1.7
Y2-7114	0.33	0.25	380	0.79	1400	65	0.74	2.1	5.2	2.2	1.7
Y2-7124	0.50	0.37	380	1.12	1400	67	0.75	2.1	5.2	2.2	1.7
Y2-8014	0.75	0.55	380	1.57	1390	71	0.75	2.1	5.2	2.3	1.7
Y2-8024	1	0.75	380	2.03	1390	73	0.76	2.3	6.0	2.3	1.6
Y2-90S-4	1.5	1.1	380	2.89	1400	75	0.77	2.3	6.0	2.3	1.6
Y2-90L-4	2	1.5	380	3.70	1400	78	0.78	2.3	6.0	2.3	1.6
Y2-100L1-4	3	2.2	380	5.16	1420	80	0.81	2.3	7.0	2.3	1.5
Y2-100L2-4	4	3	380	6.78	1420	82	0.82	2.3	7.0	2.3	1.5
Y2-112M-4	5.5	4	380	8.82	1440	84	0.82	2.3	7.0	2.3	1.5
Y2-132S-4	7.5	5.5	380	11.7	1440	85	0.83	2.3	7.0	2.3	1.4
Y2-132M-4	10	7.5	380	15.6	1440	87	0.84	2.3	7.0	2.3	1.4
Y2-160M-4	15	11	380	22.3	1460	88	0.84	2.2	7.0	2.3	1.4
Y2-160L-4	20	15	380	30.1	1460	89	0.85	2.2	7.5	2.3	1.4
Y2-180M-4	25	18.5	380	36.5	1470	90.5	0.85	2.2	7.5	2.3	1.2
Y2-180L-4	30	22	380	43.2	1470	91	0.86	2.2	7.5	2.3	1.2
Y2-200L-4	40	30	380	57.6	1480	92	0.86	2.2	7.2	2.3	1.2
Y2-225S-4	50	37	380	69.9	1480	92.5	0.87	2.2	7.2	2.3	1.2
Y2-225M-4	60	45	380	84	1480	92.8	0.87	2.2	7.2	2.3	1.1
Y2-250M-4	75	55	380	102.9	1480	93	0.87	2.2	7.2	2.3	1.1
Y2-280S-4	100	75	380	138	1480	93.8	0.87	2.2	7.2	2.3	1.0
Y2-280M-4	120	90	380	165.6	1480	94.2	0.87	2.2	7.2	2.3	1.0
Y2-315S-4	150	110	380	200.2	1480	94.5	0.88	2.1	6.9	2.2	1.0
Y2-315M-4	176	132	380	239.1	1480	94.8	0.88	2.1	6.9	2.2	1.0
Y2-315L1-4	213	160	380	288	1480	94.9	0.89	2.1	6.9	2.2	1.0
Y2-315L2-4	267	200	380	358.9	1480	95	0.89	2.1	6.9	2.2	0.9
Y2-355M-4	336	250	380	437.5	1480	95.3	0.90	2.1	6.9	2.2	0.9
Y2-355L-4	420	315	380	547.4	1480	95.6	0.90	2.1	6.9	2.2	0.8

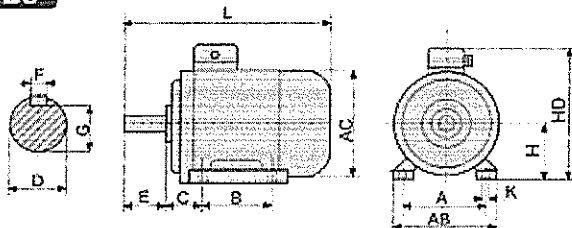
bearing use NSK Bearings Japan

Y/440V/380V/660V Voltage are available upon request

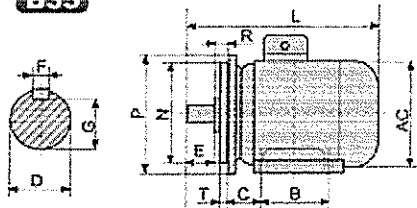
Assembled with NSK Bearings



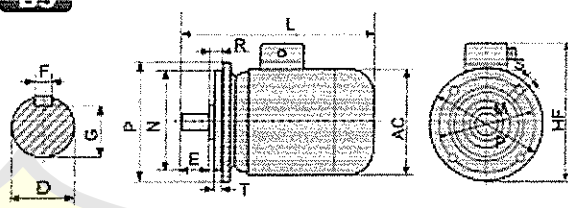
B3



B35



B5



SERIES MOTOR OVERALL & INSTALLATION DIMENSIONS

Frame Size	Mounting Dimensions (mm)															Overall Dimensions (mm)					
	A	B	C	D	E	F	G	H	K	M	N	P	R	S	T	AB	AC	AD	HD	HE	L
I	100	80	40	11	23	4	8.5	63	7	115	95	140	0	10	3	135	130	70	180	130	230
	112	90	45	14	30	5	11	71	7	130	110	160	0	10	3.5	150	145	80	195	145	255
	125	100	50	19	40	6	15.5	80	10	165	130	200	0	12	3.5	165	175	145	220	185	295
S	140	100	56	24	50	8	20	90	10	165	130	200	0	12	3.5	180	195	155	250	195	320
L	140	125	56	24	50	8	20	90	10	165	130	200	0	12	3.5	180	195	155	250	195	345
OL	160	140	63	28	60	8	24	100	12	215	180	250	0	15	4	205	215	180	270	245	385
2M	190	140	70	28	60	8	24	112	12	215	180	250	0	15	4	230	240	190	300	265	400
2S	216	140	89	38	80	10	33	132	12	265	230	300	0	15	4	270	275	210	345	315	470
2M	216	178	89	38	80	10	33	132	12	265	230	300	0	15	4	270	275	210	345	315	510
3M	254	210	108	42	110	12	37	160	15	300	250	350	0	19	5	320	330	255	420	385	615
3L	254	254	108	42	110	12	37	160	15	300	250	350	0	19	5	320	330	255	420	385	670
3M	279	241	121	48	110	14	42.5	180	15	300	250	350	0	19	5	355	380	280	455	430	700
3L	279	279	121	48	110	14	42.5	180	15	300	250	350	0	19	5	355	380	280	455	430	740
4L	318	305	133	55	110	16	49	200	19	350	300	400	0	19	5	395	420	305	505	480	770
S	356	286	149	60	140	18	53	225	19	400	350	450	0	19	5	435	470	335	560	535	815
M-2	356	311	149	55	110	16	49	225	19	400	350	450	0	19	5	435	470	335	560	535	820
M-4, 6	356	311	149	60	140	18	53	225	19	400	350	450	0	19	5	435	470	335	560	535	845
M-2	406	349	168	60	140	18	53	250	24	500	450	550	0	19	5	490	510	370	615	595	910
M-4, 6	406	349	168	65	140	18	58	250	24	500	450	550	0	19	5	490	510	370	615	595	910
S-2	457	368	190	65	140	18	58	280	24	500	450	550	0	19	5	550	580	410	680	650	985
S-4, 6	457	368	190	75	140	20	67.5	280	24	500	450	550	0	19	5	550	580	410	680	650	985
f-2	457	419	190	65	140	18	58	280	24	500	450	550	0	19	5	550	580	410	680	650	1035
f-4, 6	457	419	190	75	140	20	67.5	280	24	500	450	550	0	19	5	550	580	410	680	650	1035
3-2	508	406	216	65	140	18	58	315	28	600	550	660	0	24	6	635	645	530	845	900	1160
3-4, 6	508	406	216	80	170	22	71	315	28	600	550	660	0	24	6	635	645	530	845	900	1270
1-2	508	457	216	65	140	18	58	315	28	600	550	660	0	24	6	635	645	530	845	900	1190
1-4, 6	508	457	216	80	170	22	71	315	28	600	550	660	0	24	6	635	645	530	845	900	1300
-2	508	508	216	65	140	18	58	315	28	600	550	660	0	24	6	635	645	530	845	900	1190
-4, 6	508	508	216	80	170	22	71	315	28	600	550	660	0	24	6	635	645	530	845	900	1300
1-2	610	560	254	75	140	20	67.5	355	28	740	680	800	0	24	6	730	710	655	1010	1010	1500
1-4, 6	610	560	254	95	170	25	86	355	28	740	680	800	0	24	6	730	710	655	1010	1010	1530
-2	610	630	254	75	140	20	67.5	355	28	740	680	800	0	24	6	730	710	655	1010	1010	1500
-4, 6	610	630	254	95	170	25	86	355	28	740	680	800	0	24	6	730	710	655	1010	1010	1530

bearing use NSK Bearings Japan

Y2 SERIES MOTOR TECHNICAL DATA

Model	Output		Voltage (V)	Current (A)	Speed (r.p.m.)	Eff (%)	Power factor	Start torque Rated torque	Start current Rated current	Max. torque Rated torque	Min. torque Rated torque
	HP	KW									
380V 50Hz Synchronous Speed 1000 r/min (6 poles)											
Y2-7116	0.24	0.18	380	0.74	900	56	0.66	1.9	4.0	2.0	1.6
Y2-7126	0.33	0.25	380	0.9	900	59	0.68	1.9	4.0	2.0	1.6
Y2-8016	0.5	0.37	380	1.3	900	62	0.70	1.9	4.7	2.0	1.6
Y2-8026	0.75	0.55	380	1.8	900	65	0.72	1.9	4.7	2.1	1.6
Y2-90S-6	1	0.75	380	2.3	910	69	0.72	2.0	5.5	2.1	1.5
Y2-90L-6	1.5	1.1	380	3.2	910	72	0.73	2.0	5.5	2.1	1.5
Y2-100L-6	2	1.5	380	3.9	940	76	0.75	2.0	5.5	2.1	1.5
Y2-112M-6	3	2.2	380	5.6	940	79	0.76	2.1	6.5	2.1	1.4
Y2-132S-6	4	3	380	7.4	960	81	0.76	2.1	6.5	2.1	1.3
Y2-132M1-6	5.5	4	380	9.7	960	82	0.76	2.1	6.5	2.1	1.3
Y2-132M2-6	7.5	5.5	380	12.9	960	84	0.77	2.1	6.5	2.1	1.3
Y2-160M-6	10	7.5	380	17.0	970	86	0.78	2.0	6.5	2.1	1.2
Y2-160L-6	15	11	380	24.2	970	87.5	0.78	2.0	6.5	2.1	1.2
Y2-180L-6	20	15	380	31.6	970	89	0.81	2.0	7.0	2.1	1.2
Y2-200L1-6	25	18.5	380	38.6	970	90	0.81	2.1	7.0	2.1	1.2
Y2-200L2-6	30	22	380	44.7	970	90	0.83	2.1	7.0	2.1	1.2
Y2-225M-6	40	30	380	58.4	970	91.5	0.84	2.0	7.0	2.1	1.2
Y2-250M-6	50	37	380	70.4	970	92	0.86	2.1	7.0	2.1	1.2
Y2-280S-6	60	45	380	85.4	970	92.5	0.86	2.1	7.0	2.0	1.1
Y2-280M-6	75	55	380	103.3	970	92.8	0.86	2.1	7.0	2.0	1.1
Y2-315S-6	100	75	380	140.2	970	93.5	0.86	2.0	7.0	2.0	1.0
Y2-315M-6	120	90	380	167	970	93.8	0.86	2.0	7.0	2.0	1.0
Y2-315L1-6	150	110	380	202.3	970	94	0.86	2.0	6.7	2.0	1.0
Y2-315L2-6	176	132	380	242.3	970	94.2	0.87	2.0	6.7	2.0	1.0
Y2-355M1-6	213	160	380	287.9	970	94.5	0.88	1.9	6.7	2.0	1.0
Y2-355M2-6	267	200	380	358.4	970	94.7	0.88	1.9	6.7	2.0	0.9
Y2-355L-6	336	250	380	444.8	970	94.9	0.88	1.9	6.7	2.0	0.9
380V 50Hz Synchronous Speed 750 r/min (8 poles)											
Y2-801-8	0.25	0.18	380	0.88	630	51.0	0.61	1.8	3.3	1.9	1.3
Y2-802-8	0.34	0.25	380	1.15	640	54.0	0.61	1.8	3.3	1.9	1.3
Y2-90S-8	0.50	0.37	380	1.49	660	62.0	0.61	1.8	4.0	1.9	1.3
Y2-90L-8	0.75	0.55	380	2.18	660	63.0	0.61	1.8	4.0	2.0	1.3
Y2-100L1-8	1	0.75	380	2.17	690	71.0	0.67	1.8	4.0	2.0	1.3
Y2-100L2-5	1.5	1.1	380	2.39	690	73.0	0.69	1.8	5.0	2.0	1.2
Y2-112M-8	2	1.5	380	4.50	690	75.0	0.69	1.8	5.0	2.0	1.2
Y2-132S-8	3	2.2	380	6.00	710	78.0	0.71	1.8	6.0	2.0	1.2
Y2-132M-8	4	3.0	380	7.90	710	79.0	0.73	1.8	6.0	2.0	1.3
Y2-160M1-8	5.5	4.0	380	10.3	720	81.0	0.73	1.9	6.0	2.0	1.2
Y2-160M2-8	7.5	5.5	380	13.6	720	83.0	0.74	2.0	6.0	2.0	1.2
Y2-160L-8	10	7.5	380	17.8	720	85.5	0.75	2.0	6.0	2.0	1.2
Y2-180L-8	15	11	380	25.1	730	87.5	0.76	2.0	6.6	2.0	1.1
Y2-200L-8	20	15	380	34.1	730	88.0	0.76	2.0	6.6	2.0	1.1
Y2-225S-8	25	18.5	380	40.6	730	90.0	0.76	1.9	6.6	2.0	1.1
Y2-225M-8	30	22	380	47.4	740	90.5	0.78	1.9	6.6	2.0	1.1
Y2-250M-8	40	30	380	64.0	740	91.0	0.79	1.9	6.6	2.0	1.1
Y2-280S-8	50	37	380	78.0	740	91.5	0.79	1.9	6.6	2.0	1.1
Y2-280M-8	60	45	380	94.0	740	92.0	0.79	1.9	6.6	2.0	1.0
Y2-315S-8	75	55	380	111	740	92.8	0.81	1.8	6.6	2.0	1.0
Y2-315M-8	100	75	380	151	740	93.0	0.81	1.8	6.6	2.0	0.8
Y2-315L1-8	125	90	380	178	740	93.8	0.82	1.8	6.6	2.0	0.9
Y2-315L2-8	150	110	380	217	740	94.0	0.82	1.8	6.4	2.0	0.9
Y2-355M1-8	180	132	380	261	740	93.7	0.82	1.8	6.4	2.0	0.9
Y2-355M2-8	220	160	380	313	740	94.2	0.82	1.8	6.4	2.0	0.9
Y2-355L-8	270	200	380	388	740	94.5	0.83	1.8	6.4	2.0	0.9
380V 50Hz Synchronous Speed 600 r/min (10 poles)											
Y2-115S-10	60	45	380	100	590	91.5	0.75	1.5	6.2	2.0	0.8
Y2-115M-10	75	55	380	121	590	92.0	0.75	1.5	6.2	2.0	0.8
Y2-115L1-10	100	75	380	162	590	92.5	0.76	1.5	6.2	2.0	0.8
Y2-115L2-10	120	90	380	191	590	93.0	0.77	1.5	6.2	2.0	0.8
Y2-155M1-10	150	110	380	230	590	93.2	0.78	1.3	6.0	2.0	0.8
Y2-155M2-10	180	132	380	275	590	93.5	0.78	1.3	6.0	2.0	0.8
Y2-155L-10	215	160	380	334	590	93.5	0.78	1.3	6.0	2.0	0.8

! bearing use NSK Bearings Japan

! 0V/440V/380V/660V Voltage are available upon request

Compressors USA, Inc.

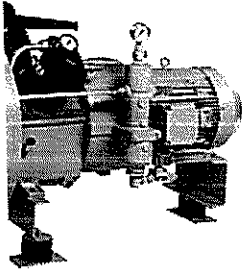
One Circle

Bellevue, MD 21666

Tel: 410-604-3142 • Fax: 410-604-3209

Email: sales@sauerusa.com • Web site: www.sauerusa.com

WP 45L Air Cooled Compressor



The 2-stage air-cooled compressors helped establish Sauer's reputation for high quality. After 75 years of production, these models are now in their third generation of development. These models are designed to have the following advantages:

- Direct drive (no belt maintenance)
- Light weight with small installation footprint
- Engineered for continuous operation in extreme environments
- Extended operation time between required maintenance intervals (2000 operating hours)

SPECIFICATIONS · FLOW AND POWER

SPECIFICATIONS

Stages	2/2
Pressure Range	100 to 580 psi
Power @ 1150 RPM, 60 Hz	11 to 13.4 hp
A. D. @ 1150 RPM, 60 Hz	20 to 23.2 SCFM
Power @ 1770 RPM, 60 Hz	13.2 to 16 hp
A. D. @ 1770 RPM, 60 Hz	31.4 to 35.7 SCFM
Power @ 1170 RPM, 60 Hz	10 hp
Power @ 1770 RPM, 60 Hz	15 hp
110 Volts @ 1170 RPM, 60 Hz	13.4 Amps
110 Volts @ 1770 RPM, 60 Hz	17.9 Amps
230 Volts @ 1170 RPM, 60 Hz	26.8 Amps
230 Volts @ 1770 RPM, 60 Hz	35.8 Amps
Weight @ 1150 RPM, 60 Hz	699.6 Pound
Weight @ 1770 RPM, 60 Hz	699.6 Pound
Sound @ 3 ft, 1170 RPM (60Hz)	83 dB(A)

Pressure @ 3 ft, 1770 RPM (60Hz)	87 dB(A)
Capacity @ 1170 RPM, 60 Hz	34,000 Btu/hr
Capacity @ 1770 RPM, 60 Hz	51,000 Btu/hr
Air Needed @ 1170 RPM, 60 Hz	1,000 CFM
Air Needed @ 1770 RPM, 60 Hz	1,530 CFM
Oil content at gas outlet (without filtration)	
Temperature (gas outlet vs. ambient) @ 1170 Hz	16 °F
Temperature (gas outlet vs. ambient) @ 1770 Hz	22 °F
Oil ambient temperature range	40-130 °F
Capacity	5.5 Quarts
Dimensions (L x W x H)	48 X 29 X 32 Inch
Method	Air-Cooled
	Direct Drive

AND POWER

5 PSIG, 1170 RPM, 60 Hz	8.7 hp
5 PSIG, 1170 RPM, 60 Hz	23.2 SCFM
5 PSIG, 1770 RPM, 60 Hz	13.3 hp
5 PSIG, 1770 RPM, 60 Hz	35.7 SCFM
10 PSIG, 1170 RPM, 60 Hz	9.7 hp
10 PSIG, 1170 RPM, 60 Hz	22.2 SCFM
10 PSIG, 1770 RPM, 60 Hz	14.6 hp
10 PSIG, 1770 RPM, 60 Hz	34.3 SCFM
15 PSIG, 1170 RPM, 60 Hz	10.2 hp
15 PSIG, 1170 RPM, 60 Hz	20.8 SCFM
15 PSIG, 1770 RPM, 60 Hz	15.4 hp

135 PSIG, 1770 RPM, 60 Hz	33.2 SCFM
580 PSIG, 1170 RPM, 60 Hz	10.7 hp
80 PSIG, 1170 RPM, 60 Hz	20.0 SCFM
580 PSIG, 1770 RPM, 60 Hz	16.1 hp
30 PSIG, 1770 RPM, 60 Hz	31.5 SCFM



Product Catalogue

CUMMINS 400KW Diesel Generator Set for Marine

Home / Product / Generator Set / Diesel Marine Generator Set /

Generator Engine

- [Cummins Diesel Engine](#)
- [Cummins Diesel Engine Parts](#)
- [Cummins Diesel Engine Spare Parts](#)

Generator Spare Parts

- [Cummins Diesel Engine](#)
- [Cummins Diesel Engine Parts](#)
- [Cummins Diesel Engine Spare Parts](#)

Generator Set

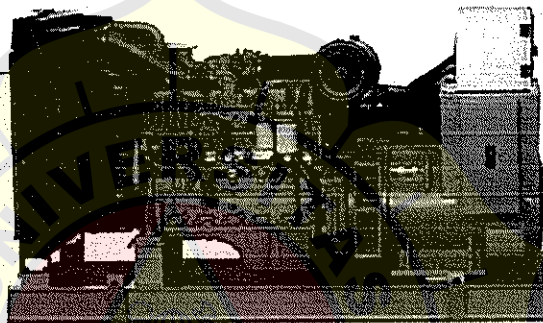
- [Cummins Diesel Engine](#)
- [Cummins Diesel Engine Parts](#)
- [Cummins Diesel Engine Spare Parts](#)
- [Marine Generator Set](#)

Generator Service

- [Yu](#)
- [Die](#)
- [e](#)
- [Lee](#)

755-33676112
 -755-29077178

[ine-trade.com](#)
[engine-trade.com](#)
[@gmail.com](#)



CUMMINS 400KW Diesel Generator Set for Marine

Engine of CUMMINS EGM400 Diesel Generator Set for Marine

Model	KTA19-G4(M)
Type	6 Cylinders In-line
Bore X Stroke (mm)	159*159
Displacement(L)	19
Compression ratio	13.9:1
Rated speed(rpm)	1500/1800
100% load fuel consumption(L/H)	83
Lube oil capacity(L)	38
Starting method	D.C. 24V Electric starting

Alternator of CUMMINS EGM400 Diesel Generator Set for Marine



Model (Marathon)	MP-H-400-4
Model (Stamford)	UCM534E
Rated voltage(V)	230/440
Rated current	According to the selected voltage and phase
Rated frequency(Hz)	50/60
Rated speed(rpm)	1500/1800
Phase	3
Winding connection	4 -wire connection, Y type
Excitation method	Brushless
Starter battery capacity(Ah)	195*2
Starter battery voltage(V)	24
Power factor	0.8
Steady-state voltage regulation	±1.0%
Temperature class	H
Insulation class	H
Voltage regulation	AVR

CUMMINS EGM400 Diesel Generator Set for Marine

Model	EGM400
Continuous output(Kw)	400
Net Weight(kg)	4700
Packing size(mm)	3400*1030*1913
Control panel	V-meter, A-meter, Frequency meter,circuit breaker, transfer switch, temp.and pressure gauges indicating lamp, hour meter, key starter, etc.

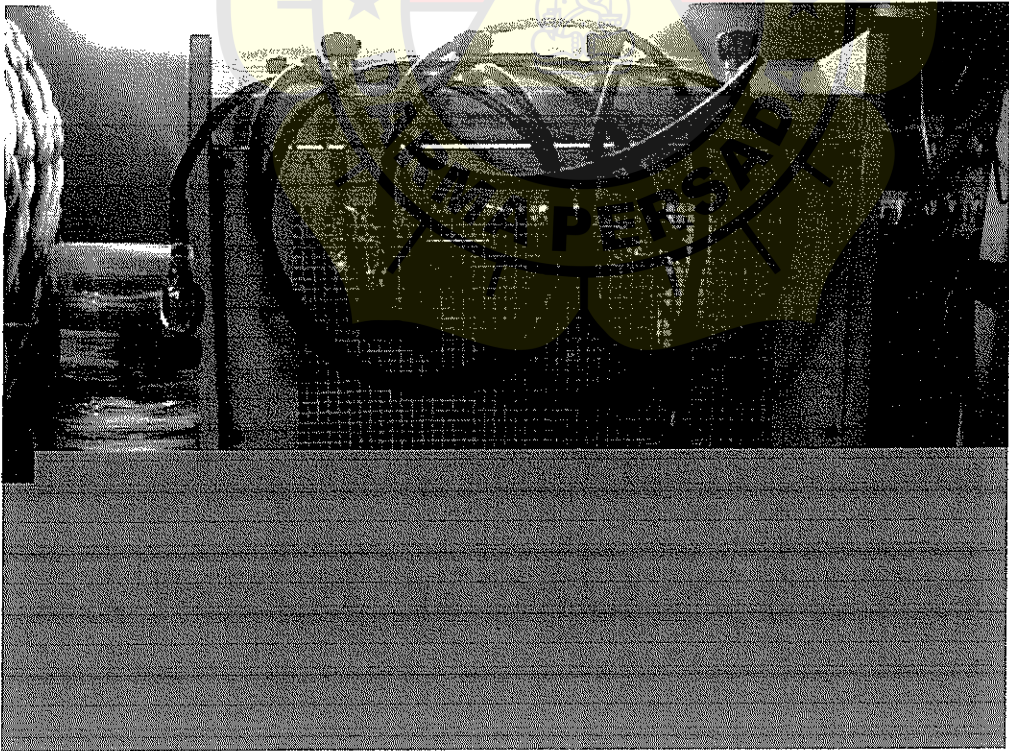
Welcome to [contact us](#) for more information of **CUMMINS 400KW Diesel Generator Set for Marine** .
Quick search: [CUMMINS Generator Set \(30KW 40KW 50KW 65KW 75KW 80KW 90KW 100KW 115KW 120KW 136KW 160KW 200KW 250KW 270KW 300KW 350KW 500KW 600KW 800KW\)](#) for Marine.

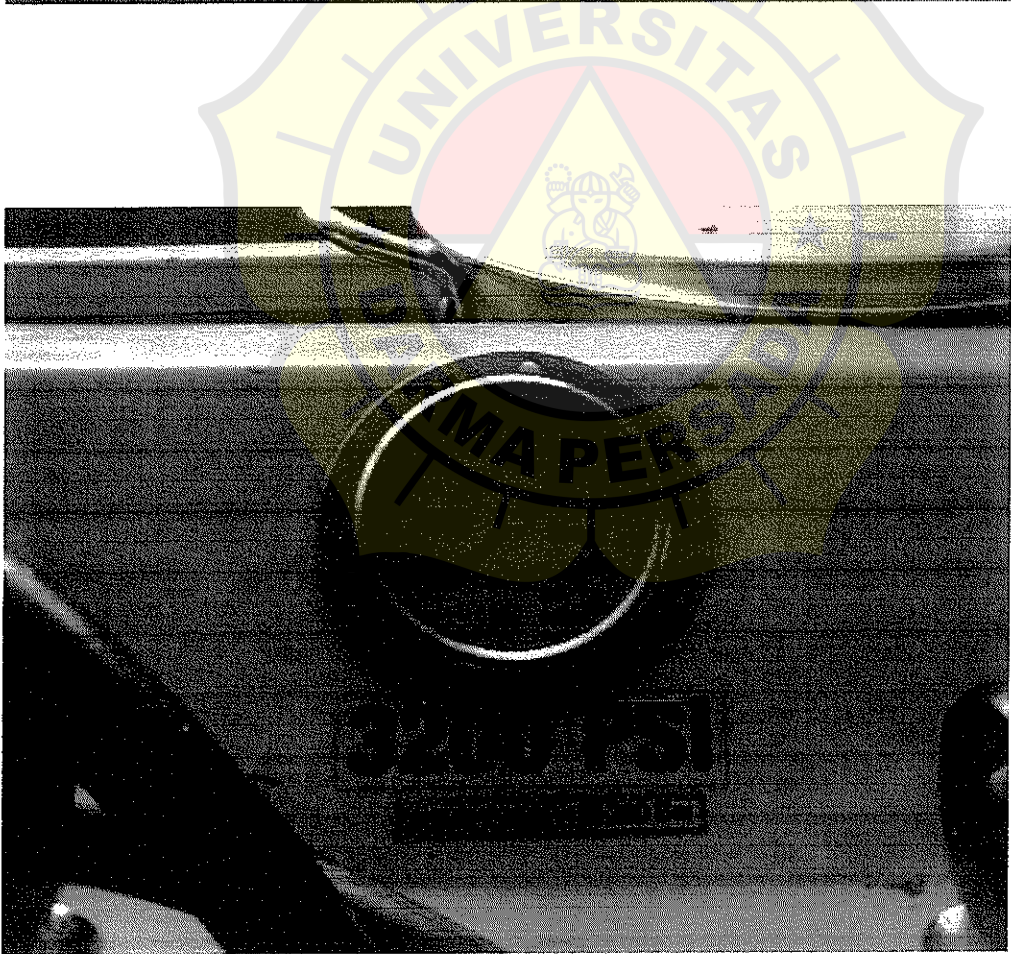
Add: ROOM 2204, MEILONGYUAN BUILDING, LONGHUA STREET,
BAOAN DISTRICT, SHENZHEN, CHINA. 518109
Tel:+86-755-33676112 Fax: +86-755-29077178 Email: service@engine-trade.com

© 2006 ET Power Machinery Co., Ltd. All rights reserved.  



HP Air Compressor Rose bauer (Austria)







Hp Air Compressor RosenBauer (Made in Austria)

Type : P135

Bar : 330 & 4700

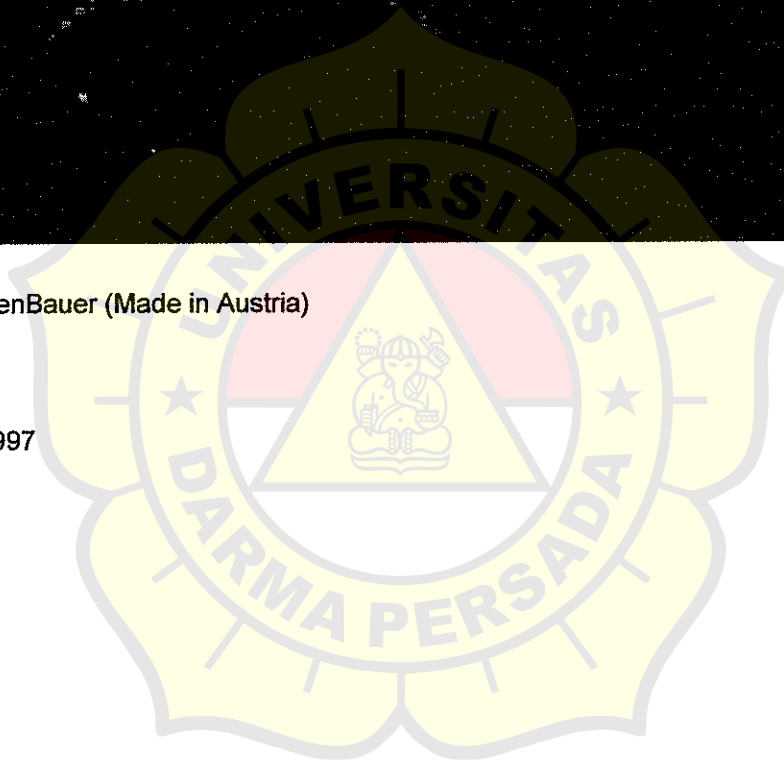
Year of Manufacture : 1997

Rpm : 1300

KW : 4

L/Min : 150

Sumber : OLX.COM PK



Series #

ASC 425D

Capacity: 678 m³/h - 400 cfm

Pressure: 5800 psig

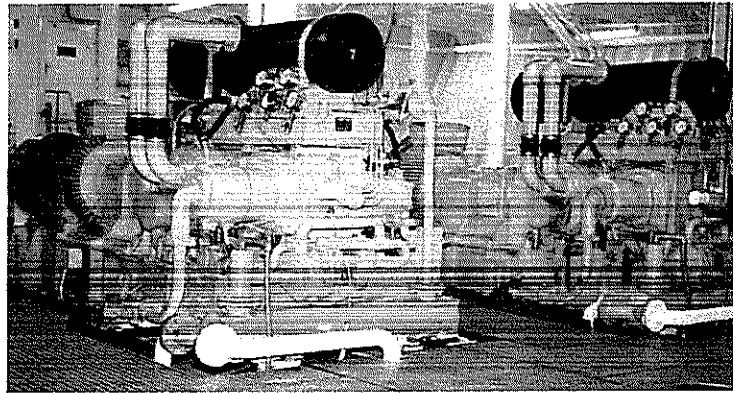
Power Supply: Diesel

Stages: 4

Design Style: Containerized

Manufacturer: Hamworthy 425

Model: Hamworthy 425



Alpha Seismic ASC 425D Hamworthy compressors offer you an integrated and compact high pressure air source solution on a rental basis for all your high-pressure needs.

General Description

Hamworthy 100mm series medium and high pressure water cooled compressors are three or four stage, two crank, water cooled, dry pressure lubricated machines. Designed for land and marine applications involving the supply of air or gas at high pressure. Available for **electric*** motor or **diesel*** engine drives.

Applications

Pressure Air Supply
 Whole Seismic Data Acquisition
 Well Seismic Data Acquisition
 etc???

Standard Features

- ▶ Air pressure gauge and safety valve for each stage
- ▶ Oil pressure gauge and relief valve
- ▶ Suction filter and silencer
- ▶ Cooler drain valves
- ▶ Integral interstage and after coolers
- ▶ High efficiency low lift concentric valves at each stage
- ▶ Fusible plugs for high temperature protection
- ▶ Air coolers and water inlet and outlet temperatures via thermometers
- ▶ Air delivery non-return valve
- ▶ Separator column
- ▶ Automatic cooler drainage and unloading systems
- ▶ Stainless steel lubricating oil tank with condensate management system
- ▶ High air temperature switch
- ▶ Low lubricating oil pressure switch
- ▶ Anti vibration mounting system
- ▶ Flexible hoses for all terminal points
- ▶ Integral SW/FW tube heat exchanger with thermostatic control valve
- ▶ Cooling water flow switch



Alpha Seismic Compressors
Corporate and Sales Office:
 One World Trade Center - Portland, Oregon
 503-244-0701 - Voice
 888-800-2232 - Toll-free
 503-244-0589 - Fax

Fleet Operations: Houston, Texas

fred@alpha seismiccompressors.com
 www.alpha seismiccompressors.com



Classification

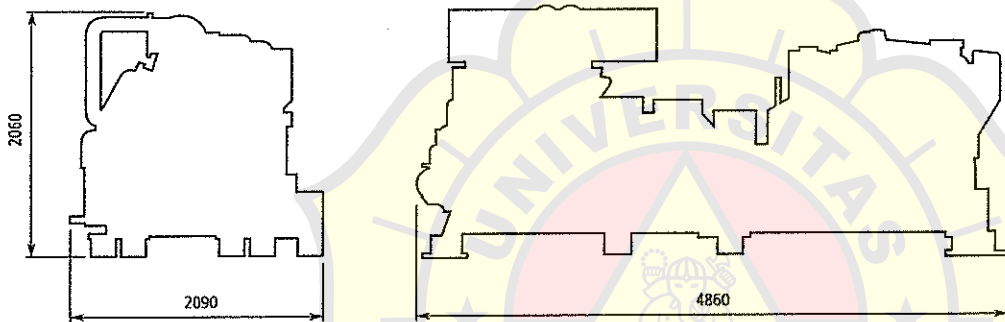
Compressor Type	Capacity		Pressure		Absorbed Power (kW)
	m ³ /h	cfm	bar	psig	
4TH 565	750 - 678	444 - 400	100 - 350	1450 - 5000	197 - 232
4TH 430	479 - 433	284 - 256	100 - 400	1450 - 5800	126 - 158
4TH 275	368 - 277	218 - 164	100 - 400	1450 - 5800	97 - 121

Capacities shown are free air delivered at constant pressure

Speed Range: 60 - 1200 rev/min

Typical model 425 D diesel driven compressor (Dimensions mm)

Weight: 7960kg



Other ASC High Pressure Compressors Rentals Available

Other models available for renting

Is Available for RENT	Stages	Air Flow Rate (CFM)	Width (inches)	Length (inches)	Height (inches)	Net Weight (lbs)	Motor Power (hp)
300D (2)		75	75	75	75	6,500	75
300E-EP (1)		75	75	75	75	6,500	75
300E-EP (1)		75	75	75	75	6,500	75
300E-EP (1)	4	425	75	75	75	6,500	75
300E (1)		75	75	75	75	6,500	75
Compressor WP 5000 (2)	4	48 - 90	61"	120"	66"	6,500	75

Electric, (2) Diesel



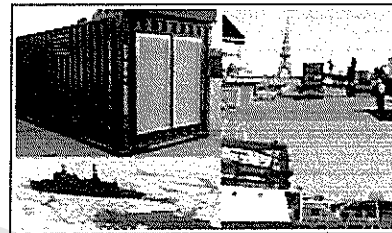
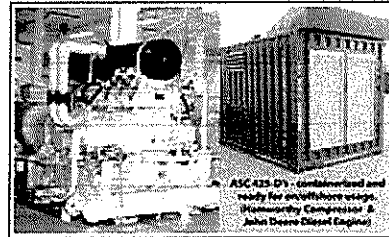
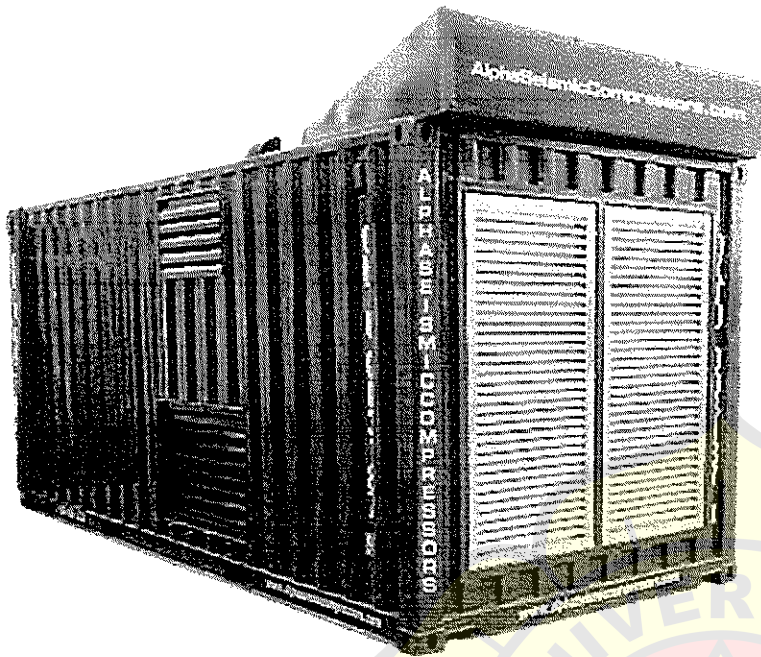
Alpha Seismic Compressors
Corporate and Sales Office:
 One World Trade Center - Portland, Oregon
 503-244-0701 - Voice
 888-800-2232 - Toll-free
 503-244-0589 - Fax

Fleet Operations: Houston, Texas

 fred@alphaseismiccompressors.com
 www.alphaseismiccompressors.com



SC 425D High Pressure Containerized Alpha Seismic Compressor



Engine: Diesel
Capacity #: Diesel - 425 CFM
Performance: Excellent
Dimensions: Width: 60 in /
 Depth: 132 in / Height: 72 in
Weight: 8,000+ lbs
Availability: Yes
 425

Houston, TX

Containerized Direct Drive Diesel powered high pressure air compressor

- 425 SCFM @ 2000 PSI
- 400 SCFM @ 3000 PSI

Features List:

- Closed loop water cooled Opposed designed pressure lubricated 4 stage Hamworthy Model - - 425 compressor
- Powered By John Deere 6135 PowerTech® Tier 3
- Rated 500BHP Diesel Engine Continuous Duty @ 1800 RPM
- Controlled by Reintjes WVS Hydraulic Reduction transmission
- 300 gallon Diesel Fuel Tank
- 30 gallon Lube Oil Tank
- On board Hydraulically driven 30KW 3 phase generator 240/120VAC
- Packaged in ISO 20ft modified ISO container suitable for worldwide shipping
- Constructed of A606 Corten - self contained seismic
- Compressor package can be connected into any master monitor system via Ethernet connection
- Meets current emission standards
- Fully automated with manual overrides
- Go anywhere with minimal mobilization (from the North Pole to the desert, land based or on board vessel)
- Unit only requires fuel

Listing Website: <http://vflyer.us/kbtgtc>



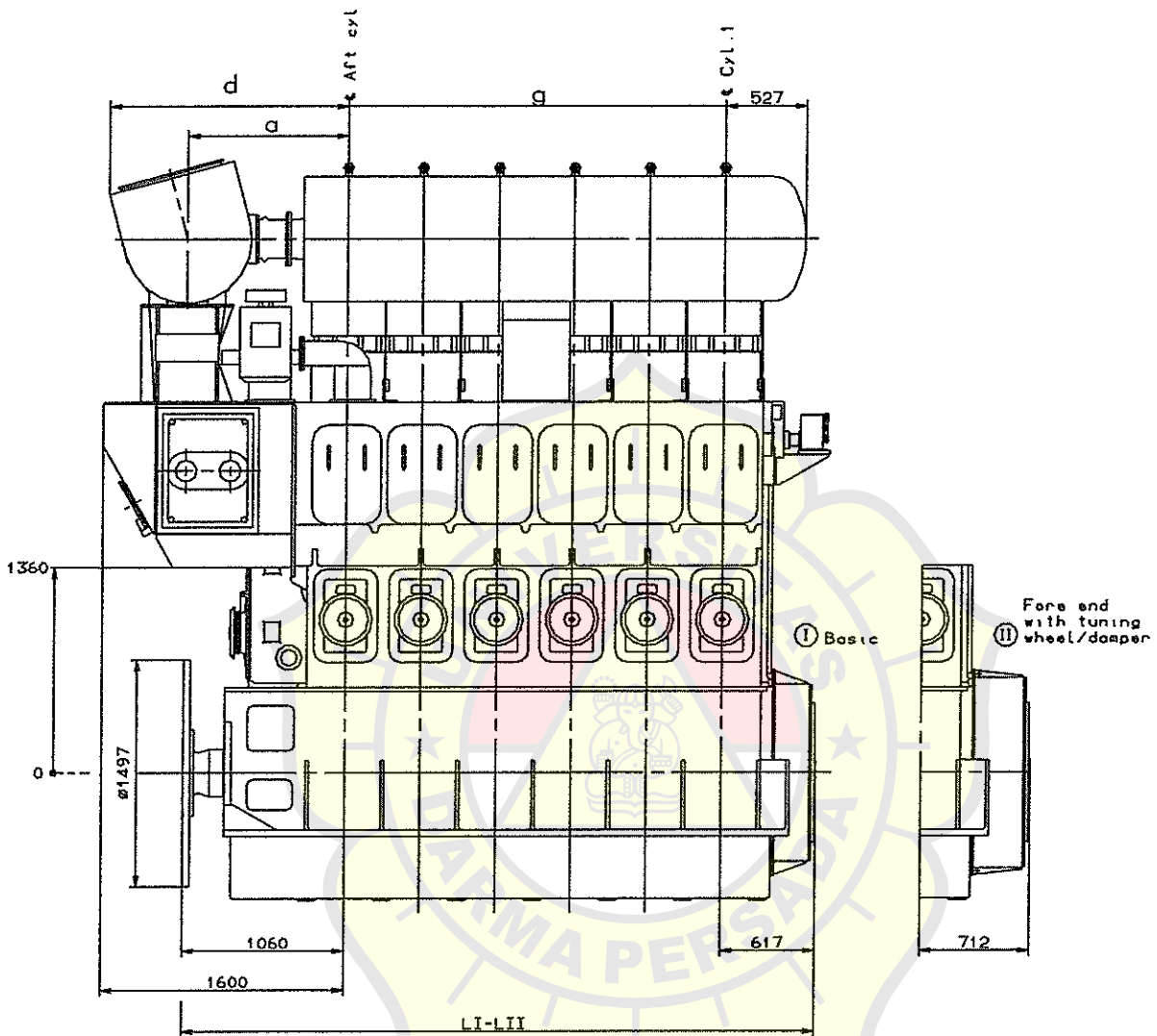
Fred Pffaffe
fred@alphaseismiccompressors.com
 1-888-800-2232



BY VFLYER.COM

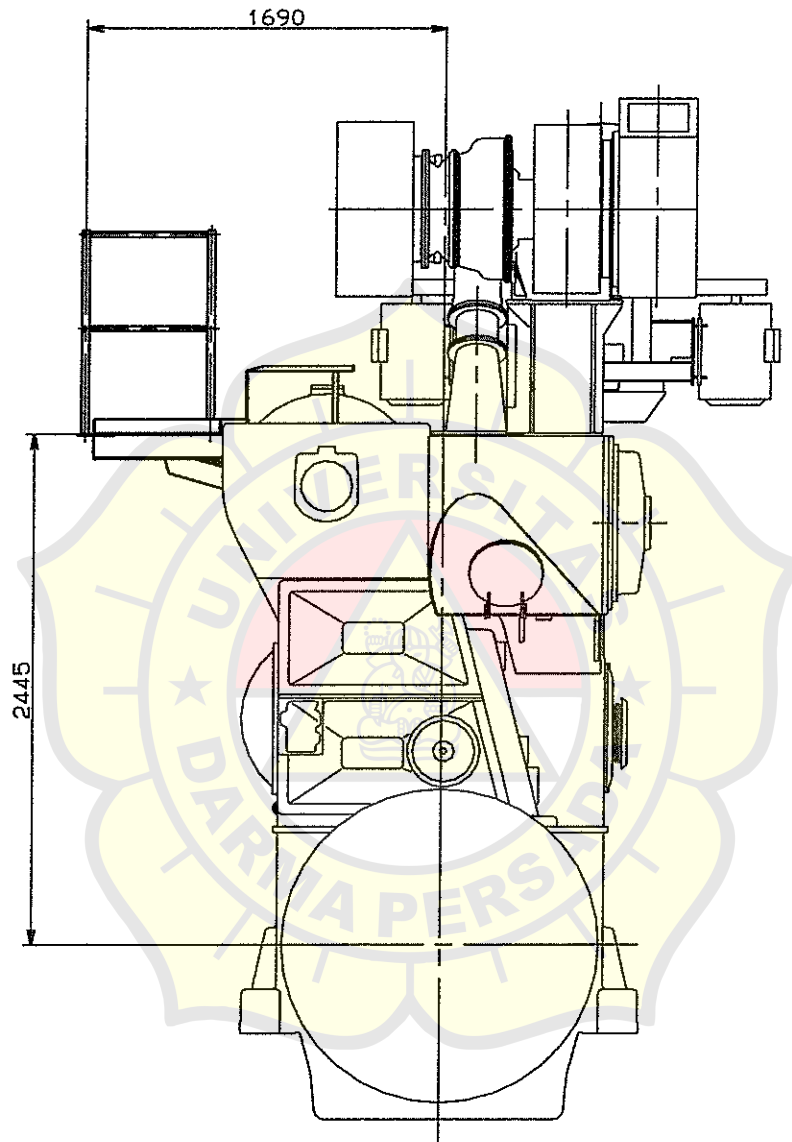
VFLYER ID: 194819004

All information in this site is deemed reliable but is not guaranteed and is subject to change



1. 5.04a: Engine outline

178 41 57-9.0



.5.07a: Gallery outline

178 41 61-4.0

SHOP ALL PRODUCTS

Store / Deep Cycle Batteries / Batteries: Flooded Lead Acid

View all products in this category: [Deep Cycle Batteries](#) [Batteries: Flooded Lead Acid](#)



\$355.52 List price \$430.00

1

Availability: 1 - 2 Weeks
Estimate Shipping



DETAILS | DOCUMENTS | SIMILAR PRODUCTS | REVIEWS

Item code	Model number	Volts	Amp Hours
TROL-16-RE-B	L-16-RE-B	6V	370A-H

Please Note: All of our Trojan batteries are shipped directly, fresh from the Trojan factory to ensure the longest lifetime and minimize their self-discharging.

Trojan will only drop ship batteries within the lower 48 states and Canada. Shipments to HI or AK will need to be consolidated in our warehouse prior to shipping.

Trojan Battery Company
6V, 370AH Premium Line Flooded Battery
L16RE-B



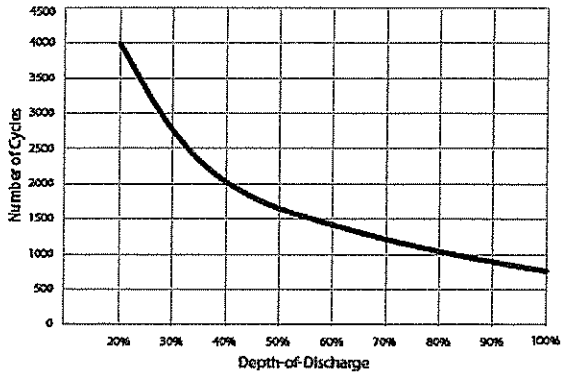
Help us improve our website:

- [Feedback](#)
- [Report a problem](#)

Product Specifications

SC Group	Type	Capacity (20-Hr)	Voltage	Weight	Length	Height	Weight
6V	Flooded	370 AH	6V	11.8 lbs	11.8 in	8.7 in	11.8 x 8.7 in

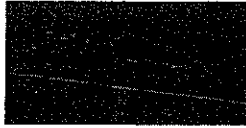
TYPICAL CYCLE LIFE IN A STATIONARY APPLICATION



Terminal Configurations



Terminal Configuration	
Terminal Material	Lead
Terminal Size (mm)	12.5 (1/2)
Terminal Spacing (mm)	100 (4.0)
Terminal Mounting	Through Hole
Terminal Orientation	Vertical



ACCREDITED BUSINESS
 BBB Rating: A+
 as of 9/5/2013
 Click For Review



AMERICAN SOLAR ENERGY SOCIETY MEMBER

McAfee SECURE TESTED DAILY 05-SEPT

PayPal VISA DISCOVER

CUSTOMER CERTIFIED 00/04/13 by bizrate

Secured by Thawte 2013-09-05

© 2013 Alternative Energy Inc. All rights Reserved.

- [ALTE®](#)
- [Press](#)
- [Affiliate Program](#)
- [Popular Searches](#)
- [Site Map](#)
- [Job Openings](#)

MORE INFORMATION

- [About Us](#)
- [Contact Us](#)
- [Help](#)
- [Returns](#)
- [Terms & Conditions](#)

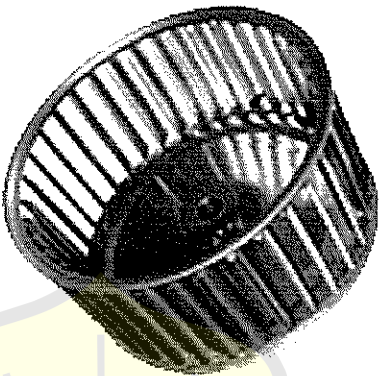
[Home](#)

[About Us](#)

[Product](#)

[Enquiry](#)

[Contact Us](#)



FPM WHEEL

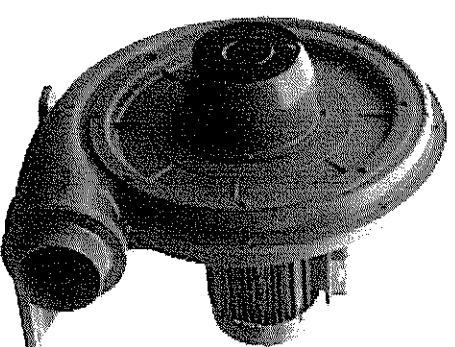
- A: Steel w/ painting
- G: galvanized
- B: aluminium
- S: Stainless Steel

Turbo Blower (Ex CamYork, Taiwan)

Centrifugal Blowers – Turbo Blowers (TB SERIES)

Features:

- Applications
 - Printing Machines
 - Burning Machines
 - Plastic Extruders, Laminating, Film Making Machines
 - Uniform Temperature Equipment
 - Household Machines
 - Dust Collectors
 - Textile Machines
 - Pollution Machines
 - Hot Air Blowers
 - Dryers Machines
 - Incinerators
 - Machinery for the Food and Beverage Industries
 - Machinery for Cooling
 - Woodworking Machines
 - Grain Elevators
- High pressure. Larger flow. Light weight.
- Aluminum alloy material was Widespread be use, offer light products.
- I.E.C. Designed motor (1HP UP), Squirrel Cage Induction Motors & specially designated shaft can satisfy long-time-continue operation.
- Professional impeller designed, high pressure, larger flow, Low noise, and long life.
- Special air-flow-adjust designs offer stable flows and easily control.
- Full range styles and sufficiently finished products of each model make quickly delivery be possible.



Type	Phase	Frequency (Hz)	Power (KW)	Voltage (V)	Current (A)	Pressure (max) kPa	Air Flow (max) m ³ /min	Out Let	Noise Level (dB)	Weight (Kgs)	Stock
TB100-1	3Φ	50/60	0.75	220/380	3/1.8	1.3/2.1	18/22	100 mm	70/80	22	V
TB100-2	3Φ	50/60	1.5	220/380	5.5/3.5	2/3	20/25	100 mm	70/85	26	V
TB125-3	3Φ	50/60	2.2	220/380	8/5	2.4/3.6	33/39	125 mm	80/90	35	V
TB150-5	3Φ	50/60	3.7	220/380	13/7.5	3.8/5.3	48/53	150 mm	90/95	57	V

TB150-10	3φ	50/60	7.5	220/380	26/15.5	3.8/5.3	60/75	150 mm	90/95	75	
TB150L-7.5A	3φ	50/60	5.5	220/380	19/11.5	5/6.5	36/48	150 mm	90/100	70	
TB150L-10	3φ	50/60	7.5	220/380	26/15.5	5/6.5	40/53	150 mm	90/100	80	
TB200-15	3φ	50/60	11	220/380	36/22	5/6.5	65/85	200 mm	95/110	140	
TB200-20	3φ	50/60	15	220/380	47/28	5/7	90/100	200 mm	95/110	155	

Copyright © 2011 BlueHeat Technology. All Rights Reserved. Developed by Web Design Company, SN-DESIGZ.



Temp. °C	Pressure kPa	spec. Density kg/m ³		spec. Volume m ³ /kg		spec. Enthalpy kJ/kg			spec. Entropy kJ/kg K	
		liquid	gas	liquid	gas	liquid	latent	gas	liquid	gas
-100	0,5594	1582,40	0,039694	0,00063195	25,193	75,362	261,488	336,85	0,4354	1,9456
-99	0,6222	1579,70	0,043901	0,00063301	22,778	76,547	260,893	337,44	0,44222	1,9403
-98	0,6911	1577,10	0,048487	0,00063407	20,624	77,731	260,289	338,02	0,449	1,9351
-97	0,7665	1574,50	0,053477	0,00063514	18,699	78,916	259,694	338,61	0,45575	1,93
-96	0,8490	1571,80	0,058902	0,00063621	16,977	80,102	259,088	339,19	0,46246	1,925
-95	0,9390	1569,10	0,06479	0,00063729	15,435	81,288	258,492	339,78	0,46913	1,9201
-94	1,0372	1566,50	0,071174	0,00063837	14,05	82,474	257,906	340,38	0,47578	1,9154
-93	1,1441	1563,80	0,078087	0,00063945	12,806	83,661	257,309	340,97	0,48238	1,9107
-92	1,2605	1561,20	0,085563	0,00064054	11,687	84,849	256,711	341,56	0,48896	1,9061
-91	1,3869	1558,50	0,09364	0,00064164	10,679	86,037	256,123	342,16	0,4955	1,9016
-90	1,5241	1555,80	0,10236	0,00064274	9,7698	87,226	255,534	342,76	0,50201	1,8972
-89	1,6728	1553,20	0,11175	0,00064384	8,9485	88,415	254,945	343,36	0,50848	1,8929
-88	1,8338	1550,50	0,12186	0,00064495	8,2059	89,606	254,354	343,96	0,51493	1,8887
-87	2,0079	1547,80	0,13274	0,00064607	7,5334	90,797	253,763	344,56	0,52134	1,8846
-86	2,1960	1545,10	0,14443	0,00064719	6,9239	91,989	253,181	345,17	0,52773	1,8805
-85	2,3990	1542,50	0,15697	0,00064831	6,3707	93,182	252,588	345,77	0,53409	1,8766
-84	2,6178	1539,80	0,17042	0,00064944	5,868	94,376	252,004	346,38	0,54041	1,8727
-83	2,8535	1537,10	0,18482	0,00065058	5,4107	95,57	251,42	346,99	0,54671	1,8689
-82	3,1070	1534,40	0,20023	0,00065172	4,9943	96,766	250,834	347,6	0,55298	1,8652
-81	3,3794	1531,70	0,2167	0,00065286	4,6147	97,963	250,247	348,21	0,55923	1,8616
-80	3,6719	1529,00	0,23429	0,00065401	4,2682	99,161	249,669	348,83	0,56544	1,858
-79	3,9856	1526,30	0,25306	0,00065517	3,9516	100,36	249,08	349,44	0,57163	1,8546
-78	4,3217	1523,60	0,27307	0,00065633	3,6621	101,56	248,5	350,06	0,5778	1,8512
-77	4,6816	1520,90	0,29438	0,0006575	3,397	102,76	247,91	350,67	0,58393	1,8478
-76	5,0665	1518,20	0,31705	0,00065867	3,154	103,96	247,33	351,29	0,59004	1,8446
-75	5,4777	1515,50	0,34116	0,00065985	2,9312	105,17	246,74	351,91	0,59613	1,8414
-74	5,9168	1512,80	0,36677	0,00066104	2,7265	106,37	246,16	352,53	0,60219	1,8382
-73	6,3851	1510,10	0,39395	0,00066223	2,5384	107,58	245,57	353,15	0,60823	1,8352
-72	6,8843	1507,30	0,42278	0,00066342	2,3653	108,78	244,99	353,77	0,61424	1,8322
-71	7,4158	1504,60	0,45333	0,00066462	2,2059	109,99	244,41	354,4	0,62023	1,8293
-70	7,9814	1501,90	0,48568	0,00066583	2,059	111,20	243,82	355,02	0,62619	1,8264
-69	8,5826	1499,10	0,51991	0,00066705	1,9234	112,41	243,24	355,65	0,63214	1,8236
-68	9,2213	1496,40	0,5561	0,00066827	1,7982	113,62	242,65	356,27	0,63806	1,8209
-67	9,8992	1493,70	0,59433	0,0006695	1,6826	114,83	242,07	356,9	0,64395	1,8182
-66	10,6180	1490,90	0,6347	0,00067073	1,5756	116,05	241,48	357,53	0,64983	1,8155
-65	11,380	1488,20	0,67728	0,00067197	1,4765	117,26	240,9	358,16	0,65568	1,813
-64	12,187	1485,40	0,72218	0,00067322	1,3847	118,48	240,31	358,79	0,66151	1,8105
-63	13,041	1482,60	0,76947	0,00067447	1,2996	119,70	239,72	359,42	0,66732	1,808
-62	13,944	1479,90	0,81927	0,00067573	1,2206	120,92	239,13	360,05	0,67311	1,8056
-61	14,899	1477,10	0,87167	0,000677	1,1472	122,14	238,54	360,68	0,67887	1,8033
-60	15,906	1474,30	0,92676	0,00067827	1,079	123,36	237,95	361,31	0,68462	1,801
-59	16,970	1471,60	0,98465	0,00067955	1,0156	124,59	237,35	361,94	0,69035	1,7987
-58	18,091	1468,80	1,0454	0,00068084	0,95654	125,81	236,77	362,58	0,69605	1,7965
-57	19,273	1466,00	1,1092	0,00068214	0,90152	127,04	236,17	363,21	0,70174	1,7944
-56	20,518	1463,20	1,1762	0,00068344	0,85022	128,27	235,57	363,84	0,70741	1,7922
-55	21,828	1460,40	1,2463	0,00068475	0,80236	129,50	234,98	364,48	0,71305	1,7902
-54	23,206	1457,60	1,3198	0,00068607	0,75768	130,73	234,38	365,11	0,71868	1,7882
-53	24,655	1454,80	1,3968	0,00068739	0,71593	131,96	233,79	365,75	0,72429	1,7862
-52	26,176	1452,00	1,4773	0,00068873	0,6769	133,20	233,18	366,38	0,72988	1,7843

Temp. °C	Pressure kPa	spec. Density kg/m ³		spec. Volume m ³ /kg		spec. Enthalpy kJ/kg			spec. Entropy kJ/kg K	
		liquid	gas	liquid	gas	liquid	latent	gas	liquid	gas
-51	27,774	1449,10	1,5616	0,00069007	0,64038	134,44	232,58	367,02	0,73546	1,7824
-50	29,451	1446,30	1,6496	0,00069142	0,6062	135,67	231,98	367,65	0,74101	1,7806
-49	31,209	1443,50	1,7416	0,00069277	0,57417	136,91	231,38	368,29	0,74655	1,7788
-48	33,051	1440,60	1,8377	0,00069414	0,54415	138,15	230,77	368,92	0,75207	1,777
-47	34,982	1437,80	1,938	0,00069551	0,51599	139,40	230,16	369,56	0,75757	1,7753
-46	37,003	1434,90	2,0427	0,00069689	0,48955	140,64	229,55	370,19	0,76305	1,7736
-45	39,117	1432,10	2,1518	0,00069828	0,46473	141,89	228,94	370,83	0,76852	1,772
-44	41,329	1429,20	2,2655	0,00069968	0,4414	143,14	228,32	371,46	0,77397	1,7704
-43	43,640	1426,40	2,384	0,00070109	0,41946	144,39	227,71	372,1	0,77941	1,7688
-42	46,055	1423,50	2,5074	0,00070251	0,39881	145,64	227,09	372,73	0,78482	1,7673
-41	48,577	1420,60	2,6359	0,00070393	0,37938	146,89	226,48	373,37	0,79023	1,7658
-40	51,209	1417,70	2,7695	0,00070537	0,36108	148,14	225,86	374	0,79561	1,7643
-39	53,955	1414,80	2,9085	0,00070681	0,34382	149,40	225,24	374,64	0,80098	1,7629
-38	56,817	1411,90	3,0529	0,00070826	0,32755	150,66	224,61	375,27	0,80633	1,7615
-37	59,801	1409,00	3,2031	0,00070973	0,3122	151,92	223,98	375,9	0,81167	1,7602
-36	62,908	1406,10	3,359	0,0007112	0,29771	153,18	223,36	376,54	0,817	1,7588
-35	66,144	1403,10	3,5209	0,00071268	0,28402	154,44	222,73	377,17	0,8223	1,7575
-34	69,512	1400,20	3,689	0,00071418	0,27108	155,71	222,09	377,8	0,8276	1,7563
-33	73,015	1397,30	3,8633	0,00071568	0,25885	156,98	221,45	378,43	0,83288	1,755
-32	76,658	1394,30	4,0441	0,00071719	0,24727	158,25	220,81	379,06	0,83814	1,7538
-31	80,444	1391,40	4,2316	0,00071872	0,23632	159,52	220,17	379,69	0,84339	1,7526
-30	84,378	1388,40	4,4259	0,00072025	0,22594	160,79	219,53	380,32	0,84863	1,7515
-29	88,463	1385,40	4,6271	0,0007218	0,21612	162,07	218,88	380,95	0,85385	1,7503
-28	92,703	1382,40	4,8356	0,00072336	0,2068	163,34	218,23	381,57	0,85906	1,7492
-27	97,104	1379,50	5,0514	0,00072492	0,19796	164,62	217,58	382,2	0,86425	1,7482
-26	101,67	1376,50	5,2748	0,0007265	0,18958	165,90	216,92	382,82	0,86943	1,7471
-25	106,40	1373,40	5,5059	0,00072809	0,18162	167,19	216,26	383,45	0,8746	1,7461
-24	111,30	1370,40	5,745	0,0007297	0,17407	168,47	215,6	384,07	0,87975	1,7451
-23	116,39	1367,40	5,9922	0,00073131	0,16688	169,76	214,93	384,69	0,8849	1,7441
-22	121,65	1364,40	6,2477	0,00073294	0,16006	171,05	214,27	385,32	0,89002	1,7432
-21	127,10	1361,30	6,5117	0,00073458	0,15357	172,34	213,6	385,94	0,89514	1,7422
-20	132,73	1358,30	6,7845	0,00073623	0,14739	173,64	212,91	386,55	0,90025	1,7413
-19	138,57	1355,20	7,0662	0,0007379	0,14152	174,93	212,24	387,17	0,90534	1,7404
-18	144,60	1352,10	7,3571	0,00073958	0,13592	176,23	211,56	387,79	0,91042	1,7396
-17	150,84	1349,00	7,6574	0,00074127	0,13059	177,53	210,87	388,4	0,91549	1,7387
-16	157,28	1345,90	7,9673	0,00074297	0,12551	178,83	210,19	389,02	0,92054	1,7379
-15	163,94	1342,80	8,287	0,00074469	0,12067	180,14	209,49	389,63	0,92559	1,7371
-14	170,82	1339,70	8,6168	0,00074643	0,11605	181,44	208,8	390,24	0,93062	1,7363
-13	177,92	1336,60	8,9568	0,00074818	0,11165	182,75	208,1	390,85	0,93564	1,7355
-12	185,24	1333,40	9,3074	0,00074994	0,10744	184,07	207,39	391,46	0,94066	1,7348
-11	192,80	1330,30	9,6688	0,00075172	0,10343	185,38	206,68	392,06	0,94566	1,7341
-10	200,60	1327,10	10,041	0,00075351	0,09959	186,70	205,96	392,66	0,95065	1,7334
-9	208,64	1323,90	10,425	0,00075532	0,095925	188,02	205,25	393,27	0,95563	1,7327
-8	216,93	1320,80	10,82	0,00075714	0,092422	189,34	204,53	393,87	0,9606	1,732
-7	225,48	1317,60	11,227	0,00075898	0,089072	190,66	203,81	394,47	0,96556	1,7313
-6	234,28	1314,30	11,646	0,00076084	0,085867	191,99	203,07	395,06	0,97051	1,7307
-5	243,34	1311,10	12,077	0,00076271	0,082801	193,32	202,34	395,66	0,97544	1,73
-4	252,68	1307,90	12,521	0,0007646	0,079866	194,65	201,6	396,25	0,98037	1,7294
-3	262,28	1304,60	12,978	0,0007665	0,077055	195,98	200,86	396,84	0,98529	1,7288

Temp. °C	Pressure kPa	spec. Density kg/m ³		spec. Volume m ³ /kg		spec. Enthalpy kJ/kg			spec. Entropy kJ/kg K	
		liquid	gas	liquid	gas	liquid	latent	gas	liquid	gas
-2	272,17	1301,40	13,448	0,00076843	0,074362	197,32	200,11	397,43	0,99021	1,7282
-1	282,34	1298,10	13,931	0,00077037	0,071782	198,66	199,36	398,02	0,99511	1,7276
0	292,80	1294,80	14,428	0,00077233	0,069309	200,00	198,6	398,6	1,00	1,7271
1	303,56	1291,50	14,939	0,00077431	0,066937	201,34	197,85	399,19	1,0049	1,7265
2	314,62	1288,10	15,465	0,00077631	0,064663	202,69	197,08	399,77	1,0098	1,726
3	325,98	1284,80	16,005	0,00077833	0,06248	204,04	196,3	400,34	1,0146	1,7255
4	337,66	1281,40	16,56	0,00078037	0,060385	205,40	195,52	400,92	1,0195	1,725
5	349,66	1278,10	17,131	0,00078243	0,058374	206,75	194,74	401,49	1,0243	1,7245
6	361,98	1274,70	17,717	0,00078451	0,056443	208,11	193,95	402,06	1,0292	1,724
7	374,63	1271,30	18,319	0,00078661	0,054587	209,47	193,16	402,63	1,034	1,7235
8	387,61	1267,90	18,938	0,00078873	0,052804	210,84	192,36	403,2	1,0388	1,723
9	400,94	1264,40	19,573	0,00079088	0,05109	212,21	191,55	403,76	1,0437	1,7226
10	414,61	1261,00	20,226	0,00079305	0,049442	213,58	190,74	404,32	1,0485	1,7221
11	428,63	1257,50	20,896	0,00079524	0,047857	214,95	189,93	404,88	1,0533	1,7217
12	443,01	1254,00	21,584	0,00079745	0,046332	216,33	189,10	405,43	1,0581	1,7212
13	457,76	1250,50	22,29	0,00079969	0,044864	217,71	188,27	405,98	1,0629	1,7208
14	472,88	1246,90	23,015	0,00080196	0,043451	219,09	187,44	406,53	1,0677	1,7204
15	488,37	1243,40	23,758	0,00080425	0,04209	220,48	186,59	407,07	1,0724	1,72
16	504,25	1239,80	24,522	0,00080657	0,04078	221,87	185,74	407,61	1,0772	1,7196
17	520,52	1236,20	25,305	0,00080891	0,039517	223,26	184,89	408,15	1,082	1,7192
18	537,18	1232,60	26,109	0,00081128	0,038301	224,66	184,03	408,69	1,0867	1,7188
19	554,24	1229,00	26,934	0,00081368	0,037128	226,06	183,16	409,22	1,0915	1,7184
20	571,71	1225,30	27,78	0,0008161	0,035997	227,47	182,28	409,75	1,0962	1,718
21	589,59	1221,70	28,648	0,00081856	0,034906	228,88	181,39	410,27	1,101	1,7177
22	607,89	1218,00	29,539	0,00082105	0,033854	230,29	180,50	410,79	1,1057	1,7173
23	626,62	1214,20	30,452	0,00082357	0,032838	231,70	179,61	411,31	1,1105	1,7169
24	645,78	1210,50	31,389	0,00082612	0,031858	233,12	178,70	411,82	1,1152	1,7166
25	665,38	1206,70	32,35	0,0008287	0,030912	234,55	177,78	412,33	1,1199	1,7162
26	685,43	1202,90	33,335	0,00083131	0,029998	235,97	176,87	412,84	1,1246	1,7159
27	705,92	1199,10	34,346	0,00083396	0,029115	237,40	175,94	413,34	1,1294	1,7155
28	726,88	1195,20	35,382	0,00083665	0,028263	238,84	175,00	413,84	1,1341	1,7152
29	748,30	1191,40	36,445	0,00083937	0,027438	240,28	174,05	414,33	1,1388	1,7148
30	770,20	1187,50	37,535	0,00084213	0,026642	241,72	173,10	414,82	1,1435	1,7145
31	792,57	1183,50	38,653	0,00084493	0,025871	243,17	172,13	415,3	1,1482	1,7142
32	815,43	1179,60	39,799	0,00084777	0,025126	244,62	171,16	415,78	1,1529	1,7138
33	838,78	1175,60	40,974	0,00085065	0,024405	246,08	170,18	416,26	1,1576	1,7135
34	862,63	1171,60	42,18	0,00085357	0,023708	247,54	169,18	416,72	1,1623	1,7131
35	886,98	1167,50	43,416	0,00085653	0,023033	249,01	168,18	417,19	1,167	1,7128
36	911,85	1163,40	44,683	0,00085954	0,02238	250,48	167,17	417,65	1,1717	1,7124
37	937,24	1159,30	45,983	0,00086259	0,021747	251,95	166,15	418,1	1,1764	1,7121
38	963,15	1155,10	47,316	0,00086569	0,021135	253,43	165,12	418,55	1,1811	1,7118
39	989,60	1151,00	48,683	0,00086884	0,020541	254,92	164,07	418,99	1,1858	1,7114
40	1016,6	1146,70	50,085	0,00087204	0,019966	256,41	163,02	419,43	1,1905	1,7111
41	1044,1	1142,50	51,523	0,00087529	0,019409	257,91	161,95	419,86	1,1952	1,7107
42	1072,2	1138,20	52,998	0,00087859	0,018868	259,41	160,87	420,28	1,1999	1,7103
43	1100,9	1133,80	54,512	0,00088195	0,018345	260,91	159,79	420,7	1,2046	1,71
44	1130,1	1129,50	56,064	0,00088537	0,017837	262,43	158,68	421,11	1,2092	1,7096
45	1159,9	1125,10	57,657	0,00088885	0,017344	263,94	157,58	421,52	1,2139	1,7092
46	1190,3	1120,60	59,292	0,00089238	0,016866	265,47	156,45	421,92	1,2186	1,7089

Temp. °C	Pressure kPa	spec. Density kg/m ³		spec. Volume m ³ /kg		spec. Enthalpy kJ/kg			spec. Entropy kJ/kg K	
		liquid	gas	liquid	gas	liquid	latent	gas	liquid	gas
47	1221,3	1116,10	60,969	0,00089598	0,016402	267,00	155,31	422,31	1,2233	1,7085
48	1252,9	1111,50	62,69	0,00089965	0,015951	268,53	154,16	422,69	1,228	1,7081
49	1285,1	1106,90	64,458	0,00090338	0,015514	270,07	153,00	423,07	1,2327	1,7077
50	1317,9	1102,30	66,272	0,00090719	0,015089	271,62	151,82	423,44	1,2375	1,7072
51	1351,3	1097,60	68,134	0,00091107	0,014677	273,18	150,62	423,8	1,2422	1,7068
52	1385,4	1092,90	70,047	0,00091502	0,014276	274,74	149,41	424,15	1,2469	1,7064
53	1420,1	1088,10	72,012	0,00091905	0,013887	276,31	148,18	424,49	1,2516	1,7059
54	1455,5	1083,20	74,03	0,00092317	0,013508	277,89	146,94	424,83	1,2563	1,7055
55	1491,5	1078,30	76,104	0,00092737	0,01314	279,47	145,68	425,15	1,2611	1,705
56	1528,2	1073,40	78,235	0,00093166	0,012782	281,06	144,41	425,47	1,2658	1,7045
57	1565,6	1068,30	80,426	0,00093604	0,012434	282,66	143,11	425,77	1,2705	1,704
58	1603,6	1063,20	82,679	0,00094052	0,012095	284,27	141,80	426,07	1,2753	1,7035
59	1642,3	1058,10	84,996	0,0009451	0,011765	285,88	140,48	426,36	1,2801	1,703
60	1681,8	1052,90	87,379	0,00094979	0,011444	287,50	139,13	426,63	1,2848	1,7024
61	1721,9	1047,60	89,832	0,00095459	0,011132	289,14	137,75	426,89	1,2896	1,7019
62	1762,8	1042,20	92,358	0,0009595	0,010827	290,78	136,36	427,14	1,2944	1,7013
63	1804,4	1036,80	94,958	0,00096454	0,010531	292,43	134,95	427,38	1,2992	1,7006
64	1846,7	1031,20	97,637	0,0009697	0,010242	294,09	133,52	427,61	1,304	1,7
65	1889,8	1025,60	100,4	0,000975	0,0099604	295,76	132,06	427,82	1,3088	1,6993
66	1933,7	1020,00	103,24	0,00098044	0,0096857	297,44	130,58	428,02	1,3137	1,6987
67	1978,3	1014,20	106,18	0,00098602	0,0094179	299,14	129,06	428,20	1,3185	1,6979
68	2023,7	1008,30	109,21	0,00099177	0,0091566	300,84	127,52	428,36	1,3234	1,6972
69	2069,8	1002,30	112,34	0,00099768	0,0089016	302,55	125,97	428,52	1,3283	1,6964
70	2116,8	996,25	115,57	0,0010038	0,0086527	304,28	124,37	428,65	1,3332	1,6956
71	2164,6	990,06	118,91	0,00101	0,0084095	306,02	122,75	428,77	1,3381	1,6948
72	2213,2	983,76	122,37	0,0010165	0,008172	307,78	121,08	428,86	1,343	1,6939
73	2262,7	977,33	125,95	0,0010232	0,0079399	309,55	119,39	428,94	1,348	1,6929
74	2313,0	970,78	129,65	0,0010301	0,0077129	311,33	117,67	429,00	1,353	1,692
75	2364,1	964,09	133,49	0,0010372	0,007491	313,13	115,90	429,03	1,358	1,6909
76	2416,1	957,25	137,48	0,0010447	0,0072737	314,94	114,10	429,04	1,3631	1,6899
77	2469,0	950,26	141,62	0,0010523	0,0070611	316,78	112,25	429,03	1,3682	1,6887
78	2522,8	943,10	145,93	0,0010603	0,0068527	318,63	110,35	428,98	1,3733	1,6876
79	2577,6	935,77	150,41	0,0010686	0,0066486	320,50	108,41	428,91	1,3784	1,6863
80	2633,2	928,24	155,08	0,0010773	0,0064483	322,39	106,42	428,81	1,3836	1,685
81	2689,8	920,51	159,95	0,0010863	0,0062519	324,30	104,38	428,68	1,3889	1,6836
82	2747,3	912,56	165,05	0,0010958	0,0060589	326,24	102,27	428,51	1,3942	1,6821
83	2805,8	904,37	170,38	0,0011057	0,0058692	328,21	100,09	428,3	1,3995	1,6806
84	2865,3	895,91	175,97	0,0011162	0,0056827	330,20	97,85	428,05	1,4049	1,6789
85	2925,8	887,16	181,85	0,0011272	0,005499	332,22	95,54	427,76	1,4104	1,6771
86	2987,4	878,10	188,05	0,0011388	0,0053178	334,28	93,14	427,42	1,4159	1,6752
87	3049,9	868,68	194,59	0,0011512	0,005139	336,38	90,64	427,02	1,4215	1,6732
88	3113,6	858,86	201,52	0,0011643	0,0049623	338,51	88,04	426,55	1,4273	1,671
89	3178,3	848,60	208,89	0,0011784	0,0047872	340,69	85,33	426,02	1,4331	1,6687
90	3244,2	837,83	216,76	0,0011936	0,0046134	342,93	82,49	425,42	1,439	1,6662
91	3311,2	826,47	225,2	0,00121	0,0044404	345,22	79,50	424,72	1,4451	1,6634
92	3379,3	814,43	234,31	0,0012279	0,0042678	347,59	76,33	423,92	1,4514	1,6604
93	3448,7	801,58	244,22	0,0012475	0,0040947	350,03	72,96	422,99	1,4578	1,6571
94	3519,3	787,75	255,08	0,0012694	0,0039203	352,58	69,34	421,92	1,4645	1,6534
95	3591,2	772,70	267,14	0,0012942	0,0037434	355,25	65,42	420,67	1,4715	1,6492

Temp. °C	Pressure kPa	spec. Density kg/m ³		spec. Volume m ³ /kg		spec. Enthalpy kJ/kg			spec. Entropy kJ/kg K	
		liquid	gas	liquid	gas	liquid	latent	gas	liquid	gas
96	3664,5	756,09	280,73	0,0013226	0,0035621	358,07	61,11	419,18	1,4789	1,6445
97	3739,1	737,34	296,41	0,0013562	0,0033737	361,12	56,27	417,39	1,4869	1,6389
98	3815,2	715,51	315,13	0,0013976	0,0031733	364,47	50,67	415,14	1,4957	1,6322
99	3892,9	688,60	338,85	0,0014522	0,0029512	368,34	43,82	412,16	1,5058	1,6235
100	3972,4	651,18	373,01	0,0015357	0,0026809	373,30	34,38	407,68	1,5188	1,6109

These data were collected by application REFPRO7.





Biro Klasifikasi Indonesia

DATA REGISTER KAPAL (REGISTER OF SHIP)

DATA UMUM :: GENERAL DATA

No. Register (Register No.) : 7019
Nama Kapal (Name of Ship) : BARUNA JAYA-VIII
Status : **AKTIF (ACTIVE)**
Material : **BAJA (STEEL)**
Pemilik (Owner) :
PUSAT PENELITIAN OSEANOGRAFI (PUSLIT OSEANOGRAFI LIPI)
JL.PASIR PUTIH I
ANCOL TIMUR
JAKARTA

Pelabuhan Pendaftaran (Port Of Register) : **JAKARTA**
Bendera (Flag) : **INDONESIA**
Dual Kelas (Dual Class) :

Tanda Kelas & Notasi Lambung (Class of Hull) :

A100P

- RESEARCH VESSEL

Instalasi Pendingin (Refrigerator Install) :
CMS/CHS :

Tgl. Masuk BKI (Date of Entry Class BKI) : **18-1-2000**
Pembaruan ke (No. of Renewal) : 3
Status Pending :

No. IMO (IMO No.) : 9155171
Nama Sebelumnya (Former Ship Name) :
Jenis Kapal (Kind Of Ship) : **RESEARCH VESSEL**
Operator :
PUSAT PENELITIAN OSEANOGRAFI (PUSLIT OSEANOGRAFI LIPI)
JL.PASIR PUTIH I
ANCOL TIMUR
JAKARTA

Tanda Pengenal (Distinctive Number) : **YFZQ**
Ex. Dual Kelas (Former Dual Class) :

Tanda Kelas & Notasi Mesin (Class Of Machine) :

SM

Bangunan (Building) : **LAMA (EXISTED)**

Tgl. Mulai Klas (Initial Class Period) : **1-2010**
Tahunan ke (No. of Annual) : 2

Galangan (Shipbuilder) : **MJELLEM & KARLSEN VERFT,AS**

Lokasi (Place of Build) : **NORWAY**

Tanggal Peluncuran (Date of Launch) : **14-5-1998**

LOA (m) : **53.2**

LT (mm) : **357**

T (m) : **4.3**

J. Geladak (No. of Decks) : **3**

Ukuran. Palka (Size of Hatchways) :

J. Sekat Melintang (No. of Watertight Bulkheads) : **4**

Ø & Panj. Rantai Jangkar (Ø & L. of Anchor Chain) : **32/385**

J. & Kap. Crane (No. & Cap. of Crane) : **- x - T**

Tahun Bangun (Year of Build) : **1998**

BMLD (m) : **12.5**

NT : **387**

J. Ruang / Tangki Muat (No. of Hold / Tank) : **-**

J. Palka (No. of Hatchways) : **-**

HMLD (m) : **4.7**

DWT (ton) : **557**

J. Sekat Memanjang (No. of Long Bulkheads) : **-**

J. & Berat Jangkar (No. & Weight. of Anchor) : **2/967**

DATA MESIN :: MACHINERY DATA

Sistim Start (Starting Device of Main Engine) :

Gigi Reduksi (Gear Ratio) : **1 : 7.3**

Jml. Baling-Baling (No. of Propeller) : **1**

Kecepatan Dinas (Service Speed) : **12**

Voltage : **380**

Daya Listrik (KVA) : **1596**

Jenis Mesin (Type of Engine) : **DIESEL**

Cara Kerja Mesin (Engine Work Type) : **4 TAK (CYCLE)**

Type Baling-Baling (Type of Propeller) :

Kecepatan Coba (Trail Speed) : **14**

Arus (Current) : **AC**

Jumlah Mesin Bantu (No. of Aux. Engine) : **2**

Jumlah Mesin Induk (No. of Main Engine) : **1**

Dia. x Langkah (Diameter x Stroke) : **170 x 190**

DATA MESIN INDUK :: PROPELLER

No.	Merk	Manufacture	Location	RPM	Year	BHP	Serie
-----	------	-------------	----------	-----	------	-----	-------

DATA MESIN BANTU :: AUXILIARY ENGINE DATA

Item	Merk	Manufacture	Location	Model	BHP	Year
A01	CUMMINS	CUMMINS DIESEL ENGINE CO., LTD.	USA	KTA 1962	457	1997
A02	CUMMINS	CUMMINS DIESEL ENGINE CO., LTD.	USA	KTA 1962	457	1997

Last Update Data : **31-7-2012 : 7:07:14 AM**

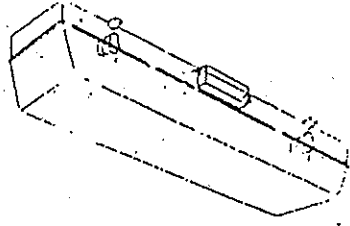
Pedoman Untuk Intensitas Iluminasi Cahaya

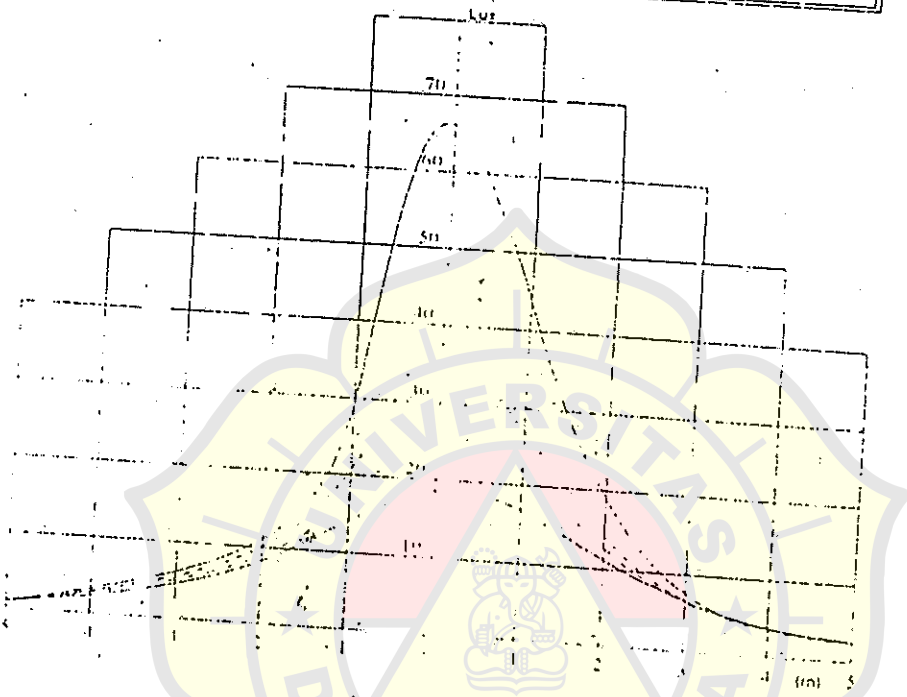
Biro Klasifikasi Indonesia **IV**

JENIS RUANGAN	FLUKSI CAHAYA (E) (Lux)
Ruang palka Ruang kerja Jalan Lalu lintas diatas deck	20 sampai 40 lux
Lorong dan jalan masuk Tempat peluncuran sokoci Kamar kecil Kamar mandi Bioskop Terowongan poros	50 sampai 70 lux
Kamar Peta Ruang kemudi Kabin penitipang Kabin awak kapal	100 sampai 150 lux
Ruang Mesin Ruang Komisaris/pemilik Ruang istirahat Ruang duduk Ruang makan/minum Perpustakaan	200 sampai 500 lux
Rumah sakit	200 lux

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :

Model	Jenis Armatur	d
	FL. 15w x 1	0.7

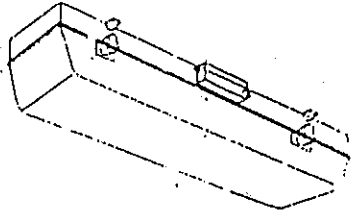


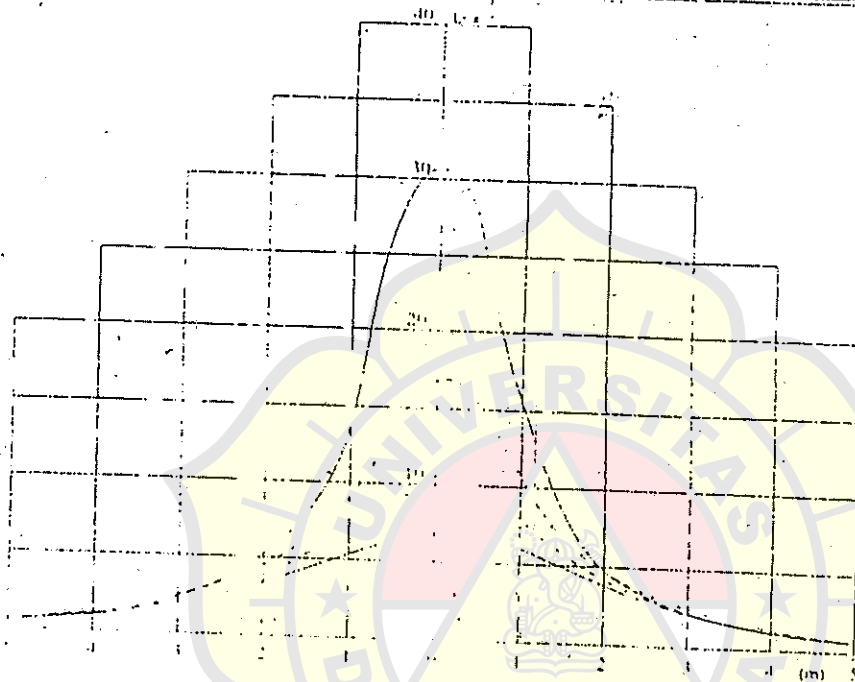
Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			30	10	0
Efisiensi:		Faktor Refleksi								
0.60	(J)	0.293	0.246	0.213	0.283	0.250	0.211	0.233	0.207	0.206
0.80	(I)	0.368	0.314	0.283	0.350	0.301	0.272	0.296	0.267	0.252
1.00	(H)	0.406	0.357	0.327	0.390	0.345	0.317	0.336	0.308	0.294
1.25	(G)	0.452	0.408	0.368	0.421	0.378	0.346	0.367	0.336	0.378
1.50	(F)	0.487	0.439	0.393	0.452	0.413	0.374	0.399	0.366	0.355
2.00	(E)	0.538	0.488	0.461	0.503	0.460	0.421	0.438	0.304	0.400
2.50	(D)	0.588	0.523	0.475	0.507	0.496	0.456	0.475	0.465	0.431
3.00	(C)	0.608	0.556	0.493	0.566	0.521	0.418	0.499	0.468	0.461
4.00	(B)	0.650	0.596	0.554	0.603	0.553	0.525	0.552	0.509	0.499
5.00	(A)	0.672	0.624	0.581	0.623	0.578	0.546	0.549	0.582	0.527

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :

4B

Model	Jenis Armatur	d
	Fl. 20 w x 2	0.7

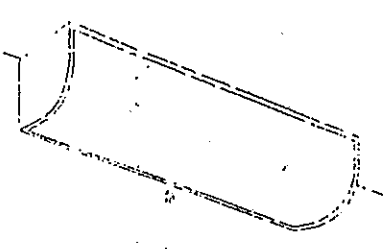


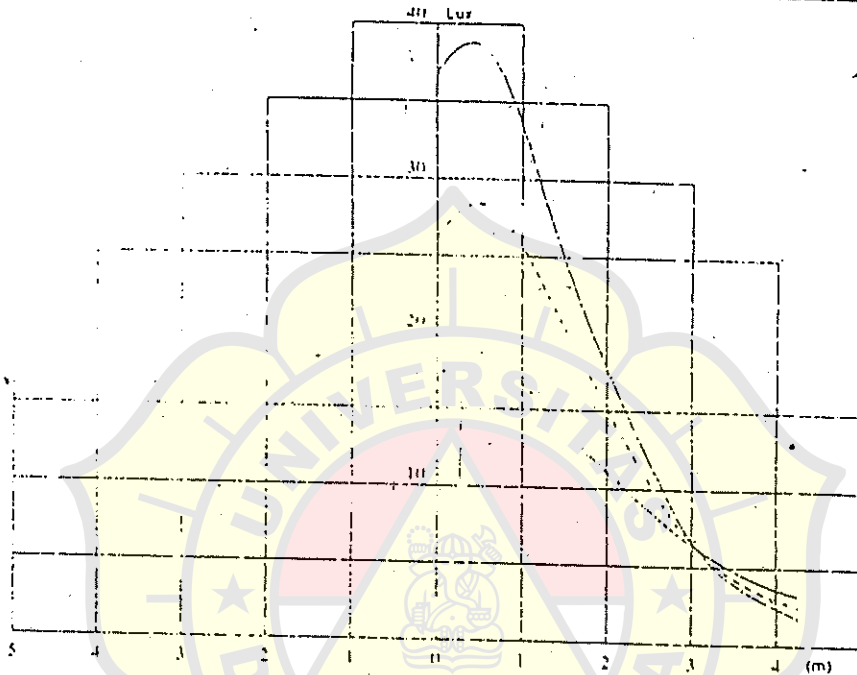
Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.285	0.233	0.213	0.268	0.235	0.213	0.230	0.209	0.239
0.80	(I)	0.322	0.294	0.278	0.315	0.287	0.231	0.256	0.268	0.265
1.00	(H)	0.345	0.318	0.313	0.343	0.321	0.305	0.318	0.302	0.282
1.25	(G)	0.382	0.353	0.340	0.369	0.347	0.331	0.361	0.329	0.309
1.50	(F)	0.405	0.381	0.355	0.385	0.366	0.349	0.394	0.367	0.329
2.00	(E)	0.433	0.412	0.390	0.419	0.402	0.379	0.412	0.376	0.356
2.50	(D)	0.465	0.435	0.415	0.469	0.434	0.408	0.417	0.405	0.385
3.00	(C)	0.481	0.454	0.414	0.461	0.433	0.421	0.431	0.415	0.395
4.00	(B)	0.490	0.472	0.457	0.478	0.455	0.444	0.454	0.437	0.457
5.00	(A)	0.511	0.486	0.469	0.491	0.464	0.459	0.457	0.406	0.436

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :

6

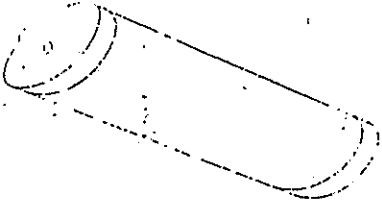
Model	Jenis Armatur	d
	FL 200 x 100	0.7

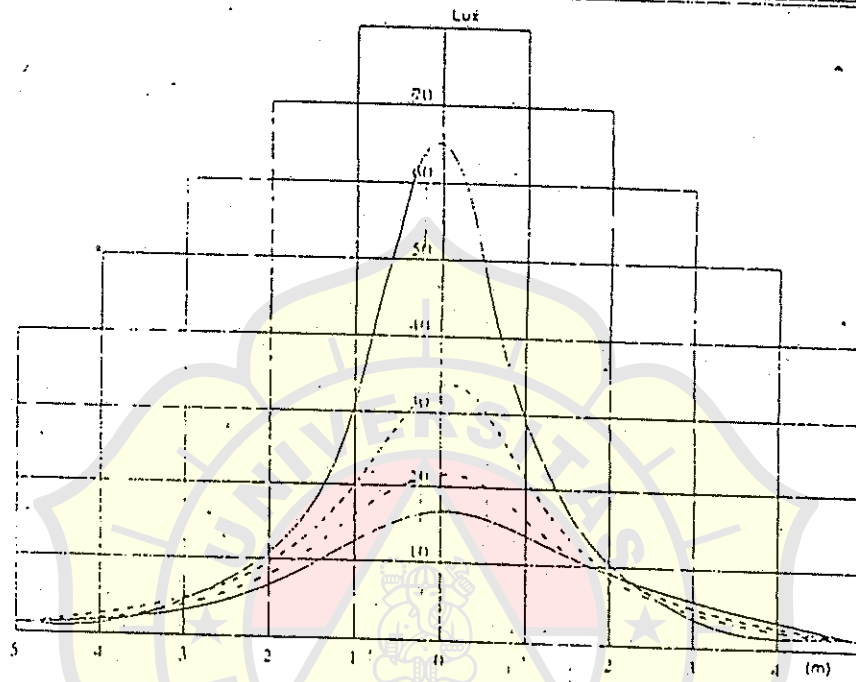


Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.150	0.120	0.100	0.140	0.120	0.100	0.110	0.100	0.100
0.80	(I)	0.190	0.160	0.140	0.180	0.160	0.140	0.150	0.130	0.120
1.00	(H)	0.220	0.190	0.170	0.210	0.180	0.160	0.180	0.160	0.150
1.25	(G)	0.250	0.220	0.200	0.240	0.210	0.190	0.200	0.170	0.170
1.50	(F)	0.270	0.250	0.220	0.260	0.230	0.220	0.220	0.210	0.190
2.00	(E)	0.300	0.280	0.260	0.280	0.260	0.250	0.250	0.230	0.210
2.50	(D)	0.320	0.300	0.280	0.300	0.280	0.270	0.270	0.250	0.230
3.00	(C)	0.330	0.310	0.300	0.310	0.300	0.280	0.280	0.270	0.250
4.00	(B)	0.350	0.350	0.320	0.330	0.320	0.310	0.300	0.290	0.270
5.00	(A)	0.370	0.350	0.350	0.340	0.330	0.320	0.310	0.310	0.280

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :
9

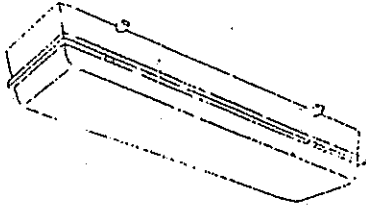
Model	Jenis Armatur	d
	Fl. 20 w x l	0.7

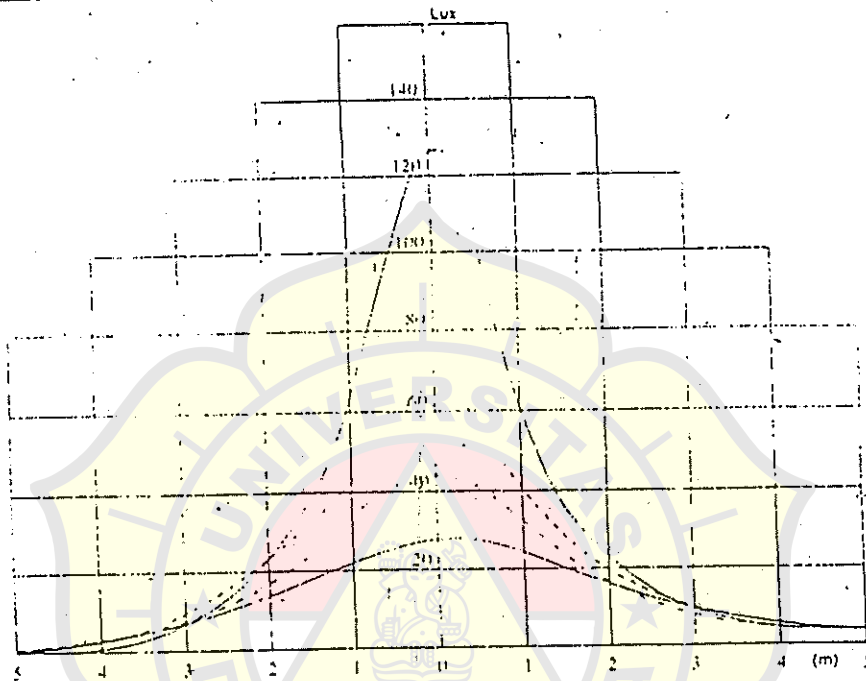


Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.262	0.230	0.210	0.255	0.232	0.210	0.227	0.206	0.186
0.80	(I)	0.314	0.291	0.275	0.312	0.284	0.268	0.283	0.265	0.245
1.00	(H)	0.350	0.325	0.310	0.340	0.318	0.302	0.315	0.299	0.279
1.25	(G)	0.379	0.355	0.337	0.366	0.440	0.328	0.338	0.326	0.306
1.50	(F)	0.407	0.378	0.352	0.382	0.363	0.346	0.361	0.345	0.326
2.00	(E)	0.420	0.407	0.387	0.416	0.399	0.376	0.384	0.373	0.353
2.50	(D)	0.460	0.432	0.412	0.445	0.421	0.405	0.414	0.402	0.382
3.00	(C)	0.478	0.451	0.421	0.459	0.425	0.418	0.428	0.412	0.392
4.00	(B)	0.496	0.469	0.454	0.475	0.442	0.441	0.443	0.434	0.416
5.00	(A)	0.508	0.483	0.446	0.488	0.466	0.450	0.454	0.443	0.423

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :
9B

Model	Jenis Armatur	d
	Fl. 20 w 81	0,7

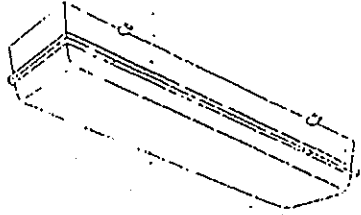


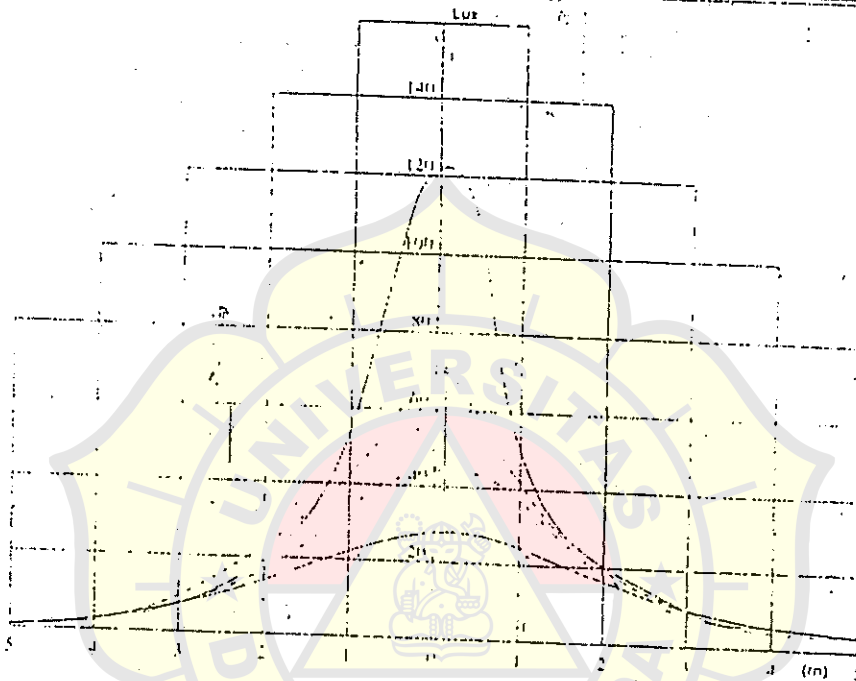
Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.262	0.230	0.210	0.255	0.232	0.210	0.227	0.206	0.186
0.80	(I)	0.314	0.291	0.275	0.312	0.284	0.268	0.283	0.265	0.245
1.00	(H)	0.350	0.325	0.310	0.340	0.310	0.302	0.315	0.299	0.279
1.25	(G)	0.379	0.355	0.337	0.366	0.440	0.328	0.338	0.326	0.306
1.50	(F)	0.407	0.378	0.352	0.382	0.363	0.346	0.361	0.345	0.326
2.00	(E)	0.420	0.407	0.387	0.416	0.399	0.376	0.384	0.373	0.353
2.50	(D)	0.460	0.432	0.412	0.445	0.421	0.405	0.414	0.402	0.382
3.00	(C)	0.478	0.451	0.421	0.459	0.425	0.418	0.428	0.412	0.392
4.00	(B)	0.496	0.469	0.454	0.475	0.442	0.441	0.443	0.434	0.416
5.00	(A)	0.508	0.483	0.446	0.488	0.466	0.450	0.454	0.443	0.423

2 . 0142
2.50 0142

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :
10B

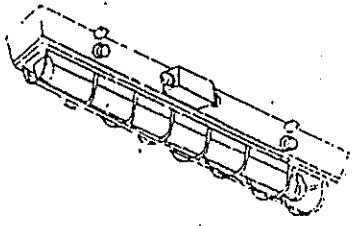
Model	Jenis Armatur	d
	FL 20 w x 2	φ 7

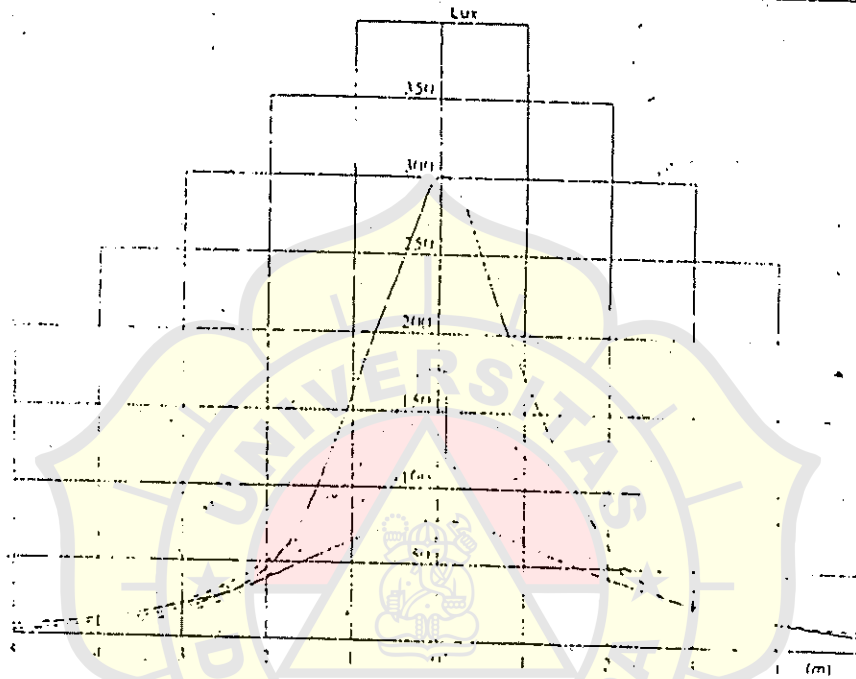


Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.265	0.233	0.213	0.258	0.235	0.213	0.230	0.209	0.179
0.80	(I)	0.322	0.294	0.278	0.315	0.287	0.271	0.286	0.268	0.247
1.00	(H)	0.353	0.318	0.313	0.343	0.321	0.305	0.318	0.302	0.282
1.25	(G)	0.382	0.352	0.340	0.369	0.347	0.331	0.341	0.329	0.309
1.50	(F)	0.405	0.381	0.355	0.385	0.366	0.369	0.364	0.348	0.329
2.00	(E)	0.433	0.412	0.390	0.413	0.402	0.379	0.392	0.376	0.356
2.50	(D)	0.465	0.435	0.415	0.448	0.424	0.408	0.417	0.405	0.385
3.00	(C)	0.481	0.454	0.474	0.461	0.438	0.421	0.431	0.415	0.395
4.00	(B)	0.499	0.472	0.457	0.478	0.455	0.444	0.444	0.437	0.417
5.00	(A)	0.511	0.484	0.469	0.491	0.464	0.453	0.457	0.446	0.426

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks
13

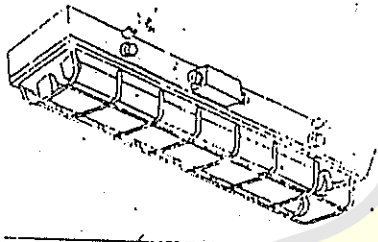
Model	Jenis Armatur	d
	Fl. 20 w x 1	0.75

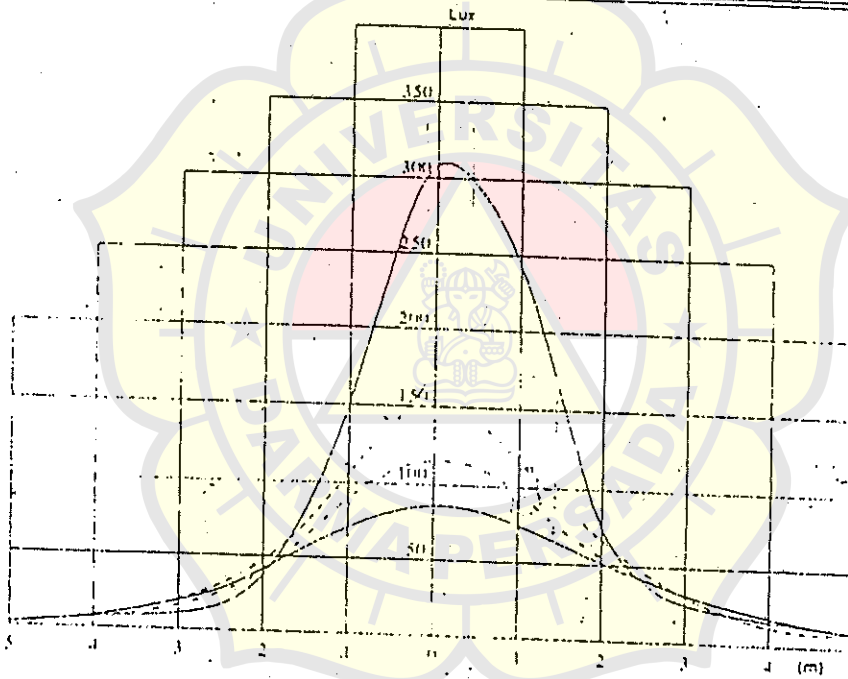


Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.329	0.282	0.253	0.322	0.288	0.252	0.277	0.250	0.241
0.80	(I)	0.407	0.357	0.330	0.392	0.347	0.322	0.347	0.317	0.308
1.00	(II)	0.445	0.402	0.376	0.434	0.394	0.368	0.388	0.358	0.350
1.25	(G)	0.489	0.447	0.412	0.466	0.428	0.398	0.421	0.343	0.388
1.50	(F)	0.526	0.483	0.440	0.496	0.482	0.426	0.453	0.423	0.417
2.00	(E)	0.573	0.529	0.487	0.546	0.509	0.472	0.493	0.461	0.452
2.50	(D)	0.614	0.563	0.521	0.584	0.545	0.508	0.531	0.503	0.493
3.00	(C)	0.640	0.594	0.539	0.608	0.568	0.532	0.552	0.525	0.515
4.00	(B)	0.676	0.627	0.590	0.642	0.596	0.570	0.581	0.560	0.553
5.00	(A)	0.696	0.653	0.615	0.659	0.619	0.590	0.599	0.581	0.592

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :
14

Model	Jenis Armatur	d
	Fl. 20 w x 2	ø 75

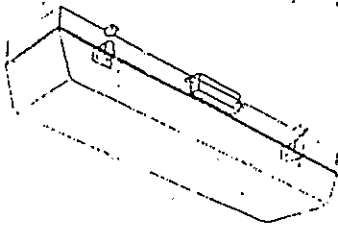


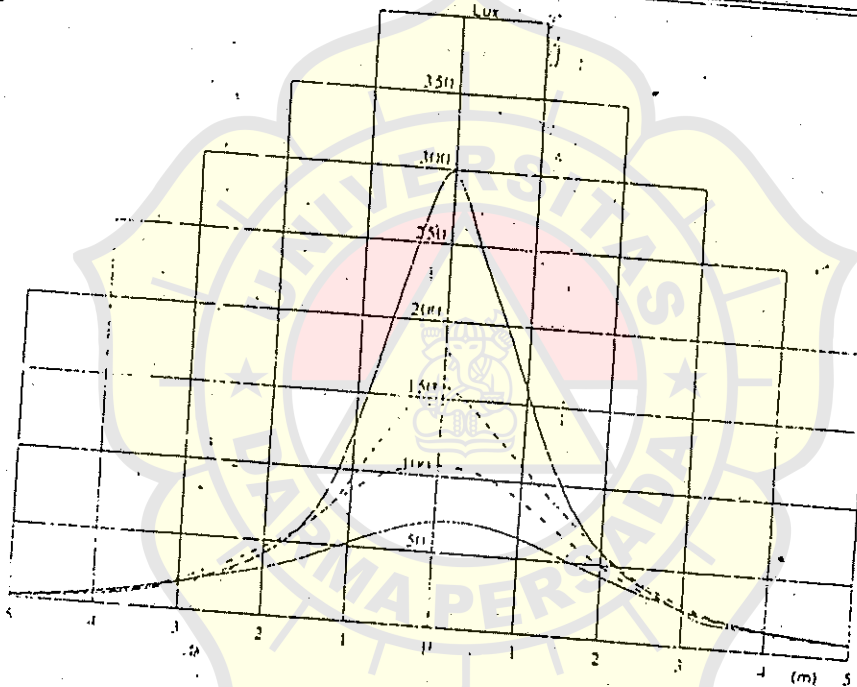
Faktor (R)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.421	0.359	0.312	0.412	0.361	0.311	0.342	0.713	0.288
0.80	(I)	0.522	0.440	0.620	0.508	0.647	0.410	0.446	0.413	0.388
1.00	(H)	0.574	0.518	0.679	0.559	0.547	0.475	0.500	0.469	0.444
1.25	(G)	0.626	0.572	0.536	0.603	0.558	0.520	0.521	0.575	0.490
1.50	(F)	0.671	0.614	0.584	0.639	0.576	0.553	0.553	0.550	0.525
2.00	(E)	0.729	0.679	0.626	0.703	0.657	0.614	0.641	0.608	0.583
2.50	(D)	0.793	0.725	0.678	0.754	0.707	0.671	0.693	0.667	0.642
3.00	(C)	0.814	0.761	0.714	0.780	0.735	0.697	0.719	0.688	0.663
4.00	(B)	0.860	0.805	0.765	0.821	0.773	0.749	0.758	0.736	0.711
5.00	(A)	0.885	0.836	0.791	0.844	0.799	0.768	0.779	0.758	0.733

LAMPIRAN PERANCANGAN INSTALASI LISTRIK PERKAPALAN

Indeks :

18

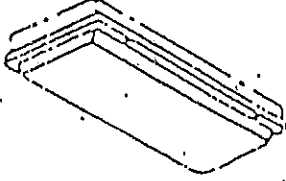
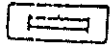


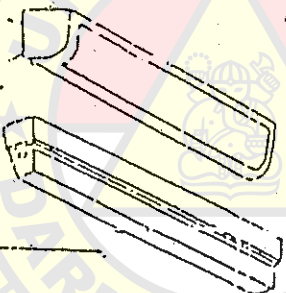

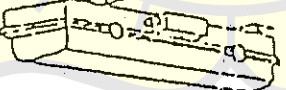



Model	Jenis Armatur	d
	Fl. 20 w x 2	0.7



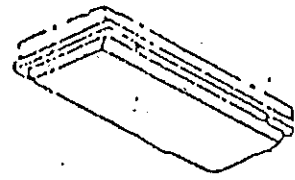
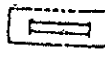


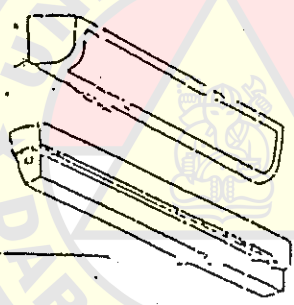

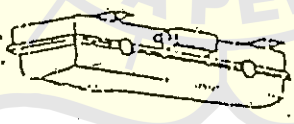

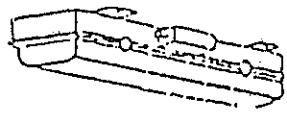

Faktor (k)	Ceiling	75			50			30		0
	Wall	50	30	10	50	30	10	30	10	0
	Floor	10			10			10		0
Efisiensi		Faktor Refleksi								
0.60	(J)	0.359	0.314	0.288	0.367	0.319	0.286	0.308	0.281	0.271
0.80	(I)	0.439	0.395	0.373	0.421	0.383	0.363	0.380	0.352	0.363
1.00	(H)	0.470	0.462	0.420	0.463	0.429	0.409	0.427	0.395	0.396
1.25	(G)	0.521	0.485	0.451	0.497	0.485	0.439	0.456	0.433	0.435
1.50	(F)	0.556	0.520	0.483	0.522	0.406	0.467	0.487	0.461	0.450
2.00	(E)	0.600	0.565	0.529	0.573	0.540	0.510	0.523	0.496	0.688
2.50	(D)	0.645	0.595	0.361	0.609	0.576	0.565	0.558	0.537	0.539
3.00	(C)	0.665	0.625	0.578	0.629	0.597	0.566	0.575	0.556	0.566
4.00	(B)	0.694	0.652	0.626	0.658	0.619	0.599	0.602	0.583	0.573
5.00	(A)	0.713	0.675	0.616	0.673	0.640	0.615	0.618	0.602	0.591

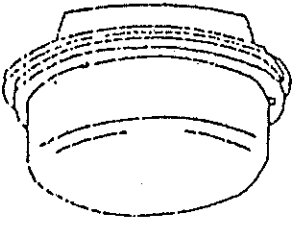

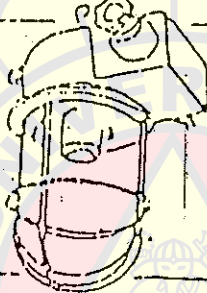
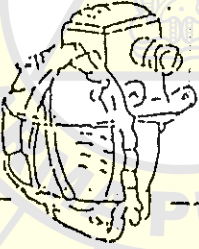

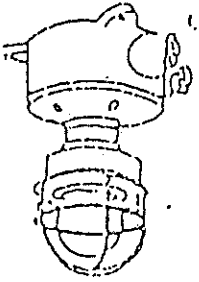
TABEL

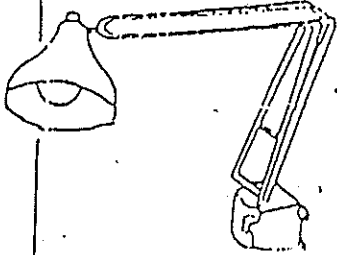
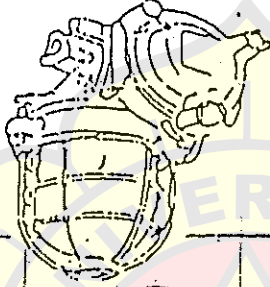

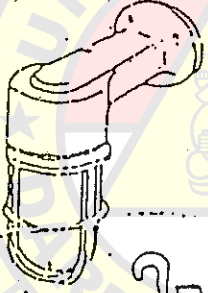


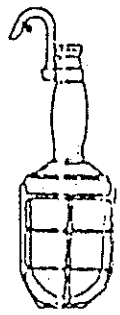
TYPE LAMPU

NO	KLASIFIKASI	MODEL	SIMBOL	KETERANGAN
1.	-KAMAR KAPTEN -KAMAR PERWIRA			-TYPE PASANGAN DG. KUTUP TENGGELEM. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU.
2	KAMAR CREW			-TYPE PASANGAN DG. KUTUP MENONJOL. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU
3	-SALURAN DALAM. -TANGGA.			-TYPE PASANGAN DG. KUTUP MENONJOL. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU
4	-DAPUR			-TYPE PASANGAN DG. KUTUP TENGGELEM. -KEDAP BUNGA API. -KACA PELINDUNG WARU TERANG
5	-KAMAR CUCI -KAMAR MAMBI -KAMAR KECIL -KAMAR PENGERING.			-TYPE PASANGAN DG. KUTUP MENONJOL. -KEDAP AIR. -KACA PELINDUNG WARU TERANG.

TABEL
TYPE LAMPU

NO	KLASIFIKASI	MODEL	SIMBOL	KETEGORIAN
1	-KAMAR KAPTEN -KAMAR PERWIRA			-TYPE PASANGAN DG. K TENGGELAM. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU.
2	KAMAR CREW			-TYPE PASANGAN DG. K MEMONJOL. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU
3	-SALURAN DALAM. -TANGGA.			-TYPE PASANGAN DG. K MEMONJOL. -TIDAK KEDAP AIR. -KACA PELINDUNG WARU SUSU
4	-DAPUR			-TYPE PASANGAN DG. K TENGGELAM. -KEDAP BUNGA API. -KACA PELINDUNG WARU TERANG
5	-KAMAR CUCI -KAMAR MANDI -KAMAR KECIL. -KAMAR PENJEB- RING.			-TYPE PASANGAN DG. K MEMONJOL. -KEDAP AIR. -KACA PELINDUNG WARU TERANG.

NO	KLASIFIKASI	MODEL	SIMBOL	KETERANGAN
11	-KAMAR PERWIRA -KAMAR CREW		(1)	-TYPE PASANGAN DENGAN KAP MENONJOL -KACA PELINDUNG WARNA SURAM -LAPISAN FLAT GELAS
12	-KAMAR MANDI -KAMAR KECIL -RUANG CUCI -RUANG PENGERING		(2)	-TYPE PASANGAN DENGAN KAP MENONJOL -KEDAP AIR -KACA PELINDUNG WARNA SURAM
13	-GEMANG -KAMAR MESIN		(3)	-KEDAP AIR -DENGAN KAP PELINDUNG -KACA PELINDUNG WARNA TERANG
14	-KAMAR PENGIN -RUANG		(3)	-KEDAP AIR -DENGAN PENGAMAN -KACA PELINDUNG WARNA TERANG
15	-GANG DALAM -LAMPU DARURAT		(4)	-TYPE PASANGAN DENGAN KAP MENONJOL -TIDAK KEDAP AIR -KACA PELINDUNG WARNA TERANG
16	-KAMAR MESIN -LAMPU DARURAT		(1)	-KEDAP AIR -DENGAN PENGAMAN -KACA PELINDUNG WARNA TERANG

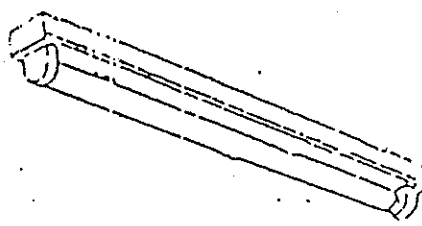
NO	KLASIFIKASI	MODEL	SIMBOL	KETERANGAN
17	-KAMAR PETA			-DIPASANG MENEMPEL PADA DINDING -TYPE LAMPU : SERET
18	-RUANG POMPA -RUANG GUDANG CAT -RUANG BATERAY -RUANG BERBAHAY			-KACA LINDUNG WARNA TERANG
19	-GANG LUAR			-TYPE DIPASANG DI DINDING -DENGAN PENGAPAN -KACA PELINDUNG WARNA TERANG
20	-RUANG KEMUDI -RUANG RADIO -RUANG GYRO			-TIDAK TERDAP AIR -DENGAN PELINDUNG -KACA PELINDUNG WARNA TERANG
21	-KAMAR MESIN			-KEJAP AIR -DENGAN PELINDUNG -KACA PELINDUNG WARNA TERANG

TABEL IV

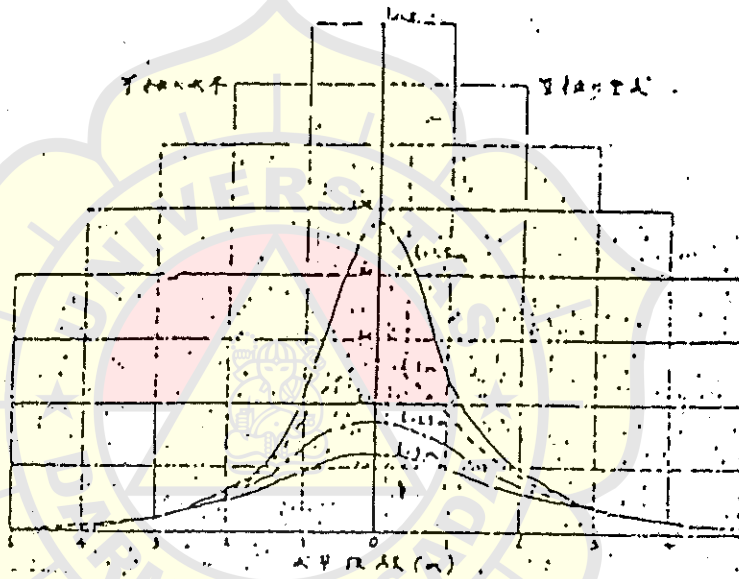
KARAKTERISTIK LAMPU

(Tabel 1) 燈具規格說明表
Fig 1

ME
SD 63

尺寸 DIMENSION	應用 APPLICATION	照度 ILLUMINATION
	FL 15 W. (1) 日光燈 (NON-WATER-TIGHT)	0.8

燈具安裝說明 Horizontal installation



REFLECTION FACTOR

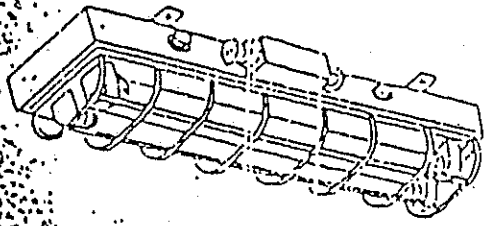
CEILING WALL REFLECTION FACTOR TABLE

X-Y Z AXIS (m)	REFLECTION FACTOR (%)									
	0.2	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
0.2 (1)	100	95	90	85	80	75	70	65	60	55
0.5 (1)	95	90	85	80	75	70	65	60	55	50
1.0 (1)	90	85	80	75	70	65	60	55	50	45
1.5 (1)	85	80	75	70	65	60	55	50	45	40
2.0 (1)	80	75	70	65	60	55	50	45	40	35
2.5 (1)	75	70	65	60	55	50	45	40	35	30
3.0 (1)	70	65	60	55	50	45	40	35	30	25
3.5 (1)	65	60	55	50	45	40	35	30	25	20
4.0 (1)	60	55	50	45	40	35	30	25	20	15
4.5 (1)	55	50	45	40	35	30	25	20	15	10

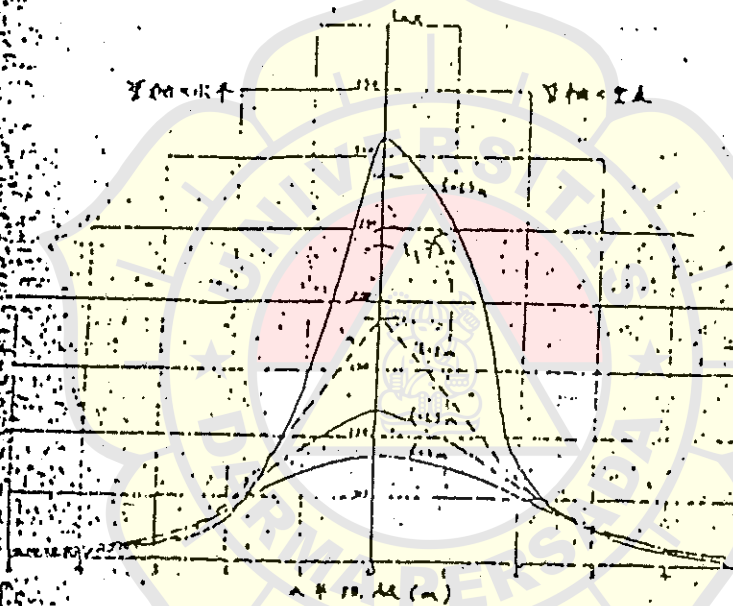
三井礦業技術標準

[行技:14] 礦坑器具技術標準

MES
SD63023

	適用 FL20 ^{mm} x 2 片端板	標準寸 7.5
---	-------------------------------------	------------

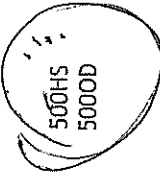
正射光面照度



距離 (m)	75			50			30		
	照度 (lx)	距離 (m)	照度 (lx)	照度 (lx)	距離 (m)	照度 (lx)	照度 (lx)	距離 (m)	照度 (lx)
0.6 (J)	257	0.6	257	100	0.6	100	257	0.6	257
0.8 (I)	157	0.8	157	63	0.8	63	157	0.8	157
1.0 (H)	100	1.0	100	40	1.0	40	100	1.0	100
1.25 (G)	64	1.25	64	25	1.25	25	64	1.25	64
1.5 (F)	44	1.5	44	18	1.5	18	44	1.5	44
2.0 (E)	25	2.0	25	10	2.0	10	25	2.0	25
2.5 (D)	16	2.5	16	6	2.5	6	16	2.5	16
3.0 (C)	11	3.0	11	4	3.0	4	11	3.0	11
4.0 (B)	6	4.0	6	2	4.0	2	6	4.0	6
5.0 (A)	4	5.0	4	1	5.0	1	4	5.0	4

47961
三井礦業技術標準

CPP Gearboxes for Workboats

Model	Power factor		Standard gearbox ratio	Sample power capacities*			Offset/Options
	kW/rpm			1200 rpm	1600 rpm	1800 rpm	
 500HS 500OD	2.400	2.03:1	2880	3840	4320	VO=500 mm 1, 2 or 3 PTOs PTI	
	2.400	2.56:1	2880	3840	4320		
	2.400	3.04:1	2880	3840	4320		
	2.400	3.32:1	2880	3840	4320		
	2.315	3.63:1	2778	3704	4167		
	1.803	4.24:1	2164	2885	3245		
	1.752	4.39:1	2102	2803	3154		
	1.433	4.56:1	1720	2293	2579		
	1.345	4.94:1	1614	2152	2421		
	1.026	5.67:1	1231	1642	1847		
	0.951	6.06:1	1141	1522	1712		
	0.810	6.56:1	972	1296	1458		
		Ratio	1200 rpm	1600 rpm	1800 rpm		
			1260	1680	1890		
500-2HS 500-2OD	1.050	6.58:1	1260	1680	1890	VO=500 mm 1, 2 or 3 PTOs	
	1.050	7.05:1	1260	1680	1890		
	1.050	7.61:1	1260	1680	1890		
	0.910	7.93:1	1092	1456	1638		
	0.910	8.49:1	1092	1456	1638		
	0.894	9.16:1	1073	1430	1609		
	0.861	9.91:1	1033	1378	1550		
	10.68:1	1010	1347	1516			

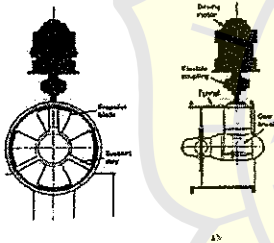
* Other engine speeds and power capacities are possible.

2.3 Bow Thruster

Bow thruster adalah suatu piranti pendorong yang dipasang pada kapal-kapal tertentu untuk membantu maneuver kapal. Unit pendorong terdiri dari suatu propeller yang berada dalam satu terowongan (tunnel) melintang kapal dan dilengkapi dengan suatu alat bantu seperti motor hidrolis atau elektrik. Selama beroperasi, air dipaksa melalui terowongan itu untuk mendorong kapal menyamping ke starboard atau portsaid sesuai keperluan kapal.

Suatu unit CPP ditunjukkan pada gambar berikut. Suatu servo-motor dan roda gigi ditempatkan dalam pelindung, sehingga memungkinkan untuk merubah sudut daun propeller CPP untuk megubah aliran air di dalam terowongan ke arah manapun, karena itu suatu prime mover yang non-reversible dapat digunakan, juga seperti single-speed electric motor. Prime mover tersebut tidak perlu dihentikan selama ber-manouver karena sudut propeller dapat diposisikan pada *zero pitch*. Prime mover dihubungkan dengan suatu flexible drive shaft, kopleng dan bevel gear (roda gigi kerucut).

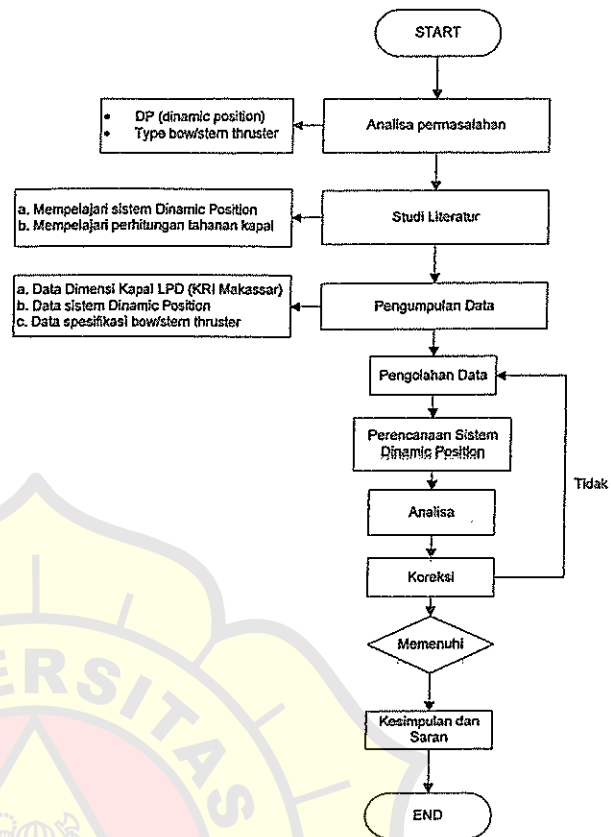
Seal (penyekat) khusus dipasang pada unit untuk mencegah kebocoran air laut. Unit lengkap (bow thruster) beserta peralatannya termasuk terowongan melintang kapal dapat mengakibatkan daya dorong sesuai dengan arah aliran air.



Gambar.3. Bow/Stern Thruster

III. METODOLOGI

Metodologi tugas akhir merupakan urutan sistematis tahapan pengerjaan tugas akhir. Penelitian ini akan dilakukan secara berurutan sesuai dengan metodologi yang disusun mulai awal hingga akhir. Metodologi tugas akhir ini dapat digambarkan pada flowcart berikut .



Gambar. 4 .metodologi penulisan

Metodologi penelitian yang telah ditunjukkan oleh gambar 3.1 pada dasarnya mempunyai tiga tahap diantaranya persiapan (preparation), proses analisa dan kesimpulan. Uraian dari ketiga proses tersebut adalah :

3.1 Persiapan

Tahapan persiapan yang dilakukan adalah dengan melakukan study literature tentang semua hal yang diperlukan. Dalam hal ini menyangkut stabilitas kapal dan bagaimana kaitan studi literatur dengan analisa permasalahan mengenai pemilihan bow/stern thruster untuk system Dinamic Position pada kapal LPD (KRI Makassar).

3.1.1 Penentuan definisi dan komponen terkait.

Pada tahapan ini adalah bagian yang terpenting. Semua yang berkaitan dengan perhitungan tahanan kapal harus dapat dijelaskan dan didefinisikan dengan baik. Hal yang tidak kalah pentingnya adalah penentuan komponen-komponen yang terkait pada penempatan letak bow/stern

thruster pada kapal dengan menggunakan system Dynamic Position .

3.1.2 Definisi batasan sistem dan komponen

Langkah selanjutnya dari tahap persiapan yaitu mendefinisikan batasan dari sistem yang akan dianalisa, hal yang terpenting antara lain: mempunyai pengetahuan yang tepat tentang apa yang harus dan tidak dimasukkan dalam sistem sehingga fungsi-fungsi penting yang berpotensi dapat dimasukkan dalam analisa. Dan juga untuk membuat hasil analisa jadi berkualitas maka komponen-komponen yang pentinglah yang harus dimasukkan dalam sistem.

3.1.3 Penentuan Tata Letak Sistem dan Peralatan

Tahapan persiapan yang terakhir adalah menentukan letak yang sesuai untuk pemasangan system dan bow/stern thruster. Dalam hal ini diperlukan data mengenai gambar General Arrangement dari kapal LPD (KRI Makassar). Gambar layout ini akan menunjukkan letak pemasangan yang cocok untuk bow/stern thruster.

3.2.1 Pengolahan data

Pada tahapan ini adalah melakukan perhitungan sesuai dengan rumusan terkait. Data yang dipergunakan diperoleh dari hasil analisa dengan menggunakan perhitungan hingga nantinya diperoleh hasil yang optimal.

3.2.2 Analisa dan Koreksi

Pada tahapan ini merupakan tahapan yang terpenting untuk menganalisa serta mengoreksi apakah perhitungan telah memenuhi sesuai apa yang diharapkan.

3.3 Kesimpulan

Pada tahapan yang terakhir adalah menyusun kesimpulan. Kesimpulan ini didapatkan dari analisa yang sudah didapatkan. Dari sini diharapkan dapat diperoleh system dan penempatan bow/stern thruster yang sesuai untuk kapal LPD.

IV. ANALISA PEMBAHASAN

Selanjutnya akan dilakukan Analisa dengan menggunakan maxsurf. Berikut adalah data-data kapal yang akan dianalisa dari pemodelan Maxurf.

4.1.1 Perhitungan Thrust Untuk Bow Thruster

Perhitungan ini dipergunakan untuk mencari besarnya thrust bow thruster kapal LPD KRI Makassar. Perhitungan yang digunakan adalah sesuai dengan langkah - langkah pada referensi.

4.3.3.1 Luasan Proyeksi Daerah Memanjang Di bawah Garis Air

Jika kapal diproyeksikan secara memanjang akan didapatkan suatu daerah luasan seperti gambar 4.2 dibawah. Dengan asumsi bahwa gaya - gaya yang disebabkan oleh tahanan angin, tahanan gesek, tahanan gelombang dan arus, serta tahanan karena peralatan thruster bekerja pada titik berat luasan permukaan kapal tersebut, maka dapat dicari besarnya thrust dari masing - masing gaya tersebut. Untuk mencari luasan daerah memanjang kapal, dibedakan dalam dua kelompok, yaitu :

1. Luasan daerah memanjang di bawah permukaan garis air muatan penuh (As).
2. Luasan daerah memanjang di atas permukaan garis air muatan penuh (Aa).

Untuk luasan di bawah garis air dapat dilihat pada gambar di bawah ini.



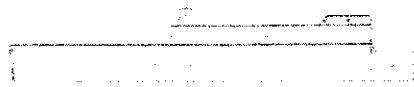
Gambar 4.2 Luasan proyeksi permukaan kapal di bawah garis air muatan penuh

Area	bentuk Pendekatan	Luas (m ²)
1	Segitiga Siku-siku	4.04
2	Persegi Panjang	8.07
3	Segitiga Siku-siku	4.04
4	Persegi Panjang	348.12
5	Segitiga Siku-siku	68.10
6	Segitiga Tak Beraturan	30.02
Total		405.21

Tabel 4.2 Hasil Perhitungan Luasan di Bawah Garis Air Muatan Penuh

4.3.3.2 Luasan Proyeksi Daerah Memanjang Di Atas Garis Air

Untuk mencari luasan di atas permukaan air maka proyeksi dibagi menjadi luasan - luasan seperti mencari luasan di bawah permukaan garis air, sehingga mudah untuk melakukan perhitungan seperti terlihat pada gambar di bawah ini :



Gambar 4.9 Luasan proyeksi permukaan kapal di atas garis air muatan penuh

Kode Area	bentuk Pendekatan	Luas (m ²)
1	Segitiga Siku-siku	16.19
2	Persegi Panjang	90
3	Segitiga Siku-siku	2.11
4	Persegi Panjang	29.34
5	Segitiga Siku-siku	2.43
6	Persegi Panjang	285.92
7	Persegi Panjang	15.83
8	Segitiga Siku-siku	6.18
9	Persegi Panjang	949.55
	Total	1397.55

Tabel 4.3 Hasil Perhitungan Luasan di Atas Garis Air Muatan Penuh

4.3.3.3 Mencari Titik Berat Luasan Di bawah Garis Air

Air

Gaya - gaya yang bekerja pada permukaan kapal akan bertumpu pada suatu titik pusat tekan luasan proyeksi kapal memanjang. Untuk mencari titik berat secara bertahap dibagi dalam dua bagian yaitu :

1. Titik berat luasan di bawah garis air
2. Titik berat luasan di atas garis air

Sebagai titik pusat ditentukan letak titik nol untuk menghitung panjang atau posisi titik beratnya.



Gambar 4.19 Penentuan titik zero point terhadap luasan kapal di bawah garis air

kode area	bentuk pendekatan	luas (m ²)	Letak titik berat dari zero point (m)	X (m)
		a	b	a x b
1	Segitiga Siku-siku	4.04	106.78	431.39
2	Persegi Panjang	8.07	104.40	842.51
3	Segitiga Siku-siku	4.04	103.20	416.93
4	Persegi Panjang	348.12	100.81	35093.98
5	Segitiga Siku-siku	68.10	23.45	1596.95
6	Segitiga Tak	30.0	15.80	474.3

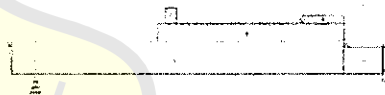
Beraturan	2		2
	462.		38856
total luas =	39	454.44	.07
titik berat =	C(luas x titik berat) / C luas		84.03

Tabel 4.4 Hasil perhitungan titik berat luasan bidang proyeksi memanjang di bawah garis air

4.3.3.4 Mencari Titik Berat Luasan Di atas Garis Air

Air

Dengan cara yang sama seperti mencari titik berat luasan di bawah garis air, sehingga dapat dihitung letak titik berat luasan di atas garis air dengan titik acuan yang dipakai adalah sama dengan titik yang dipakai untuk menghitung titik berat luasan di bawah garis air.



Gambar 4.20 Penentuan titik zero point terhadap luasan kapal di atas garis air

Kode Area	bentuk Pendekatan	Luas (m ²)	Letak titik berat dari zero point (m)	X (m)
		a	b	a x b
1	Segitiga Siku-siku	16.19	106.23	1719.86
2	Persegi Panjang	90	102.31	9207.90
3	Segitiga Siku-siku	2.11	92.12	194.37
4	Persegi Panjang	29.34	90.67	2660.26
5	Segitiga Siku-siku	2.43	78.89	191.70
6	Persegi Panjang	285.92	90.68	25927.23
7	Persegi Panjang	15.83	42.28	669.29
8	Segitiga Siku-siku	6.18	-3.24	-20.02
9	Persegi Panjang	949.55	90.68	86105.19
	total luas =	1397.55	689.87	126651.15
	titik berat =	C(luas x titik berat) / C luas		90.62

Tabel 4.5 Hasil perhitungan titik berat luasan bidang proyeksi memanjang di atas garis air

4.3.3.5 Perhitungan tahanan

1. Tahanan angin

$$RA = K_a \times A_a \times V_a^2$$

dimana :

K_a = koefisien yang diakibatkan oleh angin
= 0,735 kgm / m⁴

A_a = Luasan proyeksi memanjang kapal di atas garis air
= 405.21 m²

V_a = Kecepatan relatif terhadap gerakan kapal
= 10 m/s (rata-rata)

$RA = 0,735 \text{ kgm/m}^4 \times 405.21 \text{ m}^2 \times (10 \text{ m/s})^2$

$RA = 29782.93 \text{ kgm/s}^2$

$RA = 29782.93 \text{ N} = 29,78 \text{ kN}$

2. Tahanan gesek

$$R_w = K_w \times A_w \times ((V_w + V_s)^2 + 0.33 \times (V_w + V_s))$$

+ V_s)

dimana :

K_w = Koefisien tahanan gesek
= 1,212 kgm / m⁴

A_w = Luas permukaan basah (WSA)
= 2585.93 m²

V_w = kecepatan gelombang dan arus
= 2 knots = 1,03 m/s

V_s = kecepatan kapal pada saat pengoperasian Bow/stern thruster di pelabuhan
= 0,3 m/s (rata - rata)

$R_w = 1,212 \text{ kgm/m}^4 \times 2585.93 \text{ m}^2 \times ((1,03 \text{ m/s} + 0,3 \text{ m/s})^2 + 0.33 \times (1,03 \text{ m/s} + 0,3 \text{ m/s}))$

$R_w = 6919.57 \text{ kgm/s}^2$

$R_w = 6919.57 \text{ N} = 6,92 \text{ kN}$

3. Tahanan bentuk

$$R_v = K_v \times A_s \times (V_s)^2$$

dimana :

K_v = Koefisien tahanan bentuk
= 73,2 kgm / m⁴

A_s = Luasan proyeksi memanjang kapal di bawah garis air
= 405.21 m²

V_s = kecepatan kapal pada saat pengoperasian bow thruster di pelabuhan
= 0,3 m/s (rata - rata)

$R_v = 73,2 \text{ kgm/m}^4 \times 405.21 \text{ m}^2 \times (0,3 \text{ m/s})^2$

$R_v = 2669,52 \text{ kgm/s}^2$

$R_v = 2669,52 \text{ N} = 2,66 \text{ kN}$

4. Tahanan karena peralatan

$$R_p = K_p \times D_s^2 \times (V_w + V_s)^2$$

dimana :

K_p = Koefisien tahanan karena peralatan
= 26,4 kgm / m⁴

D_s = Diameter tunnel thruster dapat

diketahui dengan cara mencari nilai f-nya terlebih dahulu, kemudian bisa diketahui besarnya daya (kW) dari thruster yang dimaksud. Besarnya daya (kW) ini adalah sementara dan belum yang sesungguhnya. Dari nilai daya (kW) tersebut dapat dicari besarnya diameter tunnel thruster yang disediakan oleh perusahaan pembuat bow thruster dalam hal ini dipakai merk thruster master. Sehingga bisa diketahui nilai average tunnelnya. Data dari kapal yang digunakan yaitu :

$L_{pp} = 109,2 \text{ m}$

$T = 4.5 \text{ m}$

Maka dipilihlah stern thruster dengan spesifikasi sebagai berikut:

Type	: Aqua Manoeuvra Propulsors 500T
Voltage	: 380/440 V
Frequency	: 50/60 Hz
Max power rating	: 525 kW
Propeller Diameter	: 1420 mm

4.3.3.6 Peletakan stern Thruster

Mengacu pada referensi, maka peletakan stern thruster untuk kapal LPD (KRI Makassar) adalah sebagai berikut :

1. stern thruster diletakkan di frame no.33 - 39 atau sama dengan 20,44 m dihitung dari AP sampai ke titik pusat stern thruster.
2. jarak bow thruster 95,05 m.
3. ketinggian bow thruster 1,6 m.
4. jarak zero point dengan center gravity 51,53 m.
5. jarak stern thruster dengan zero point 20,44 m.
6. jarak stern thruster dengan center gravity 31,09 m.

Gambar 4.21 Peletakan bow thruster

4.3.3.7 Ratio kecepatan berputar dengan menggunakan stern Thruster

Mengacu dari rumus II.25 bisa didapatkan :

$$\dot{\Psi} (^{\circ}/s) = \frac{k}{L_{pp}} \sqrt{\frac{f}{\rho}}$$

Dimana:

K	= derajat kebebasan = 190° (nilai deviasi rata-rata)
L_{pp}	= 109.02 m
f	= thrust/ratio luasan lateral = 160 N/m ²
ρ	= densitas massa fluida = 1025 kg/m ³

$$\begin{aligned}\Psi (^{\circ}/s) &= \frac{190^{\circ}}{109,2} \sqrt{\frac{160 \text{ N/m}^2}{1025 \text{ kg/m}^3}} \\ &= 0,69^{\circ} / \text{detik} \\ &= 41,25^{\circ} / \text{menit}\end{aligned}$$

Maka dapat diketahui untuk melakukan satu putaran penuh (360°) diperlukan waktu = 4,25 menit

4.3.3.8 Transvering Motion

Gaya-gaya yang bekerja pada kapal untuk gerakan transversal dapat diasumsikan sebagai berikut :



Gambar 4.22 Gaya untuk transvering motion

keterangan :

R = stern thrust

B = bow thrust

Y = oppositely thrust

Oppositely thrust ditentukan dengan persamaan sebagai berikut :

$$Y = -0,5 \cdot \rho \cdot v^2 \cdot T \cdot L_{pp} \cdot C_{DAV} \quad (\text{Brix, 1992})$$

dimana :

Y = Gaya yang harus dilawan untuk melakukan transveing motion (kN)

ρ = densitas massa fluida = 1025 kg/m³

v = kecepatan kapal pada saat pengoperasian bow thruster = 0,3 m/s

T = 4,5 m

L_{pp} = 109,2 m

C_{DAV} = cross flow resistance = rata-rata dari C_o yang harganya dapat

dilihat pada lampiran, diambil karakteristik type kapal twin screw = 0.826

Untuk mendukung kerja S/T diperlukan independent generator set, dalam hal ini generator set yang dipilih adalah:

Type : CATETPILLAR 3508B – DM 1493-03

Power : 800 kW

FOC : 100% Load : 51,8 g/h

75% Load : 39,0 g/h

50% Load : 27,2 g/h

25% Load : 15,5 g/h

Fuel : MDO

Dengan demikian :

Load factor generator = 525 / 800 = 0,656

FOC menjadi = $\{[(0,656-0,5)/(0,75-0,5)] \times (39-27,2)\} + 27,2 = 34,56 \text{ g/h}$

V. KESIMPULAN DAN SARAN

5.1. Kesimpulan

Dari hasil analisa pemilihan bow/stern thruster terhadap penggunaan system dynamic position pada kapal LPD KRI MAKASSAR maka dapat ditarik kesimpulan bahwa :

1. Secara teknis dapat disimpulkan bahwa besarnya kebutuhan thrust untuk kapal LPD KRI MAKASSAR adalah sebesar 78,62 kN. Sehingga dapat diketahui besarnya daya stern thruster tersebut sebesar 524,16 kW.
2. Setelah mengetahui daya yang dibutuhkan untuk melakukan manuver menggunakan bow thruster, kapal LPD KRI MAKASSAR dapat manuever dalam waktu 4,25 menit. Hal ini sangatlah menguntungkan karena untuk kestabilan kapal pada waktu menurunkan hovercraft dengan menggunakan system dynamic position.
3. Berdasarkan analisis system dinamic position untuk kapal LPD KRI MAKASSAR hanya menggunakan satu system control saja, karena hanya dipergunakan pada perairan yang gelombangnya tidak terlalu besar yang hanya berkisar antara 1 – 2 knots.

5.2. Saran

Untuk memperbaiki penelitian selanjutnya dalam analisa pemilihan dan perhitungan stern/bow thruster untuk kapal LPD KRI MAKASSAR, maka penulis memberikan beberapa saran sebagai pertimbangan, antara lain:

1. Perlu mempertimbangkan dynamic position kapal sehingga didapatkan analisa kelayakan yang lebih baik.
2. Pertimbangan untuk penggunaan system dynamic position dengan 2 system control, untuk system stanby jika salah satu rusak.

Cylindrical bulbs, projecting forward of the perpendicular, and Taylor non-projecting bulbs can easily be faired into U forward sections. Whether these combinations, suitable in form, lead also to minimum power requirements has yet to be discovered.

Bulbous bow projecting above CWL

It is often necessary to reduce the resistance caused by the upper side of bulbous bows which project above the CWL creating strong turbulence. The aim should be a fin effect where the upper surface of the bulb runs downwards towards the perpendicular. A bulbous bow projecting above the waterline usually has considerably greater influence on propulsion power requirements than a submerged bulb. Where a bulbous bow projects above the CWL, the authorities may stipulate that the forward perpendicular be taken as the point of intersection of the bulb contour with the CWL. Unlike well-submerged bulbs, this type of bulb form can thus increase the calculation length for freeboard and classification (Fig. 2.13). Regarding the bulb height, in applying the freeboard regulations, the length is measured at 85% of the depth to the freeboard deck. Consequently, even a bulb that only approaches the CWL can still cause an increase in the calculation length of ships with low freeboard decks, e.g. shelter-deckers (Fig. 2.14).

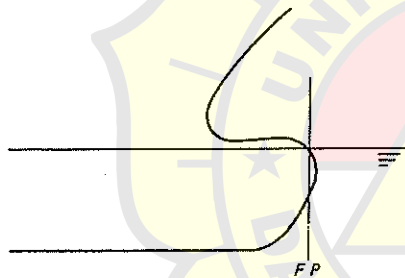


Figure 2.13 Position of forward perpendicular with high bulbous bows

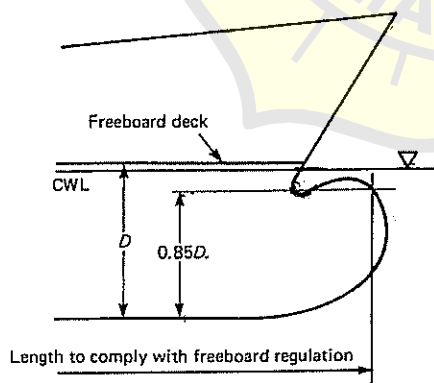
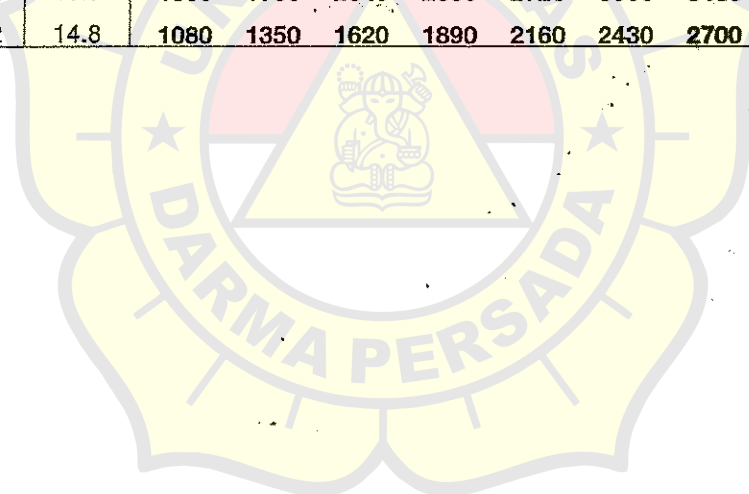


Figure 2.14 Length of freeboard calculation with low freeboard deck

52 M14801
02

12

Engine type	Layout point	Engine speed r/min	Mean effective pressure bar	Power ^{kW} BHP								
				Number of cylinders								
				4	5	6	7	8	9	10	11	12
S35MC Bore 350 mm Stroke 1400 mm	L ₁	173	19.1	2960 4040	3700 5050	4440 6060	5180 7070	5920 8080	6660 9090	7400 10100	8140 11110	8880 12120
	L ₂	173	15.3	2380	2975	3570	4165	4760	5355	5950	6545	7140
	L ₃	147	19.1	2520	3150	3780	4410	5040	5670	6300	6930	7560
	L ₄	147	15.3	2020	2525	3030	3535	4040	4545	5050	5555	6060
L35MC Bore 350 mm Stroke 1050 mm	L ₁	210	18.4	2600 3540	3250 4425	3900 5310	4550 6165	5200 7080	5850 7965	6500 8850	7150 9735	7800 10620
	L ₂	210	14.7	2080	2600	3120	3640	4160	4680	5200	5720	6240
	L ₃	178	18.4	2200	2750	3300	3850	4400	4950	5500	6050	6600
	L ₄	178	14.7	1760	2200	2640	3080	3520	3960	4400	4840	5280
S26MC Bore 260 mm Stroke 980 mm	L ₁	250	18.5	1600 2180	2000 2725	2400 3270	2800 3815	3200 4360	3600 4905	4000 5450	4400 5995	4800 6540
	L ₂	250	14.8	1280	1600	1920	2240	2560	2880	3200	3520	3840
	L ₃	212	18.5	1360	1700	2040	2380	2720	3060	3400	3740	4080
	L ₄	212	14.8	1080	1350	1620	1890	2160	2430	2700	2970	3240



178-46 78-9.1

Fig. 1.03f: Power and speed

52 M14846
47
53

		Specific fuel oil consumption		g/kWh g/BHPH	Lubricating oil consumption		
		With conventional turbochargers			System oil Approx. kg/cyl. 24h	Cylinder oil g/kWh g/BHPH	
At load layout point		100%	80%				
L35MC	L ₁	177 130	175	2-3	Hans Jensen Mechanical cyl. lubricator	MAN B&W Alpha cyl. lubricator	
	L ₂	172	170		0.8-1.2 0.6-0.9	0.7-1.1 0.5-0.8	
	L ₃	177	175				
	L ₄	172	170				
S26MC	L ₁	179 132	177	1.5-3	0.95-1.5 0.7-1.1	0.95-1.5 0.7-1.1	
	L ₂	174	172				
	L ₃	179	179				
	L ₄	174	172				

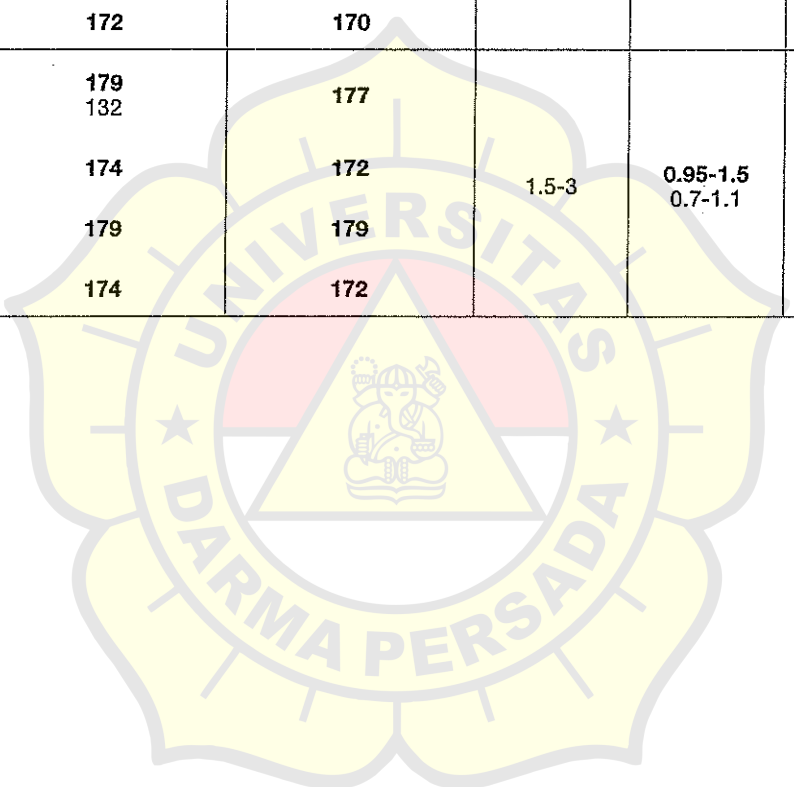
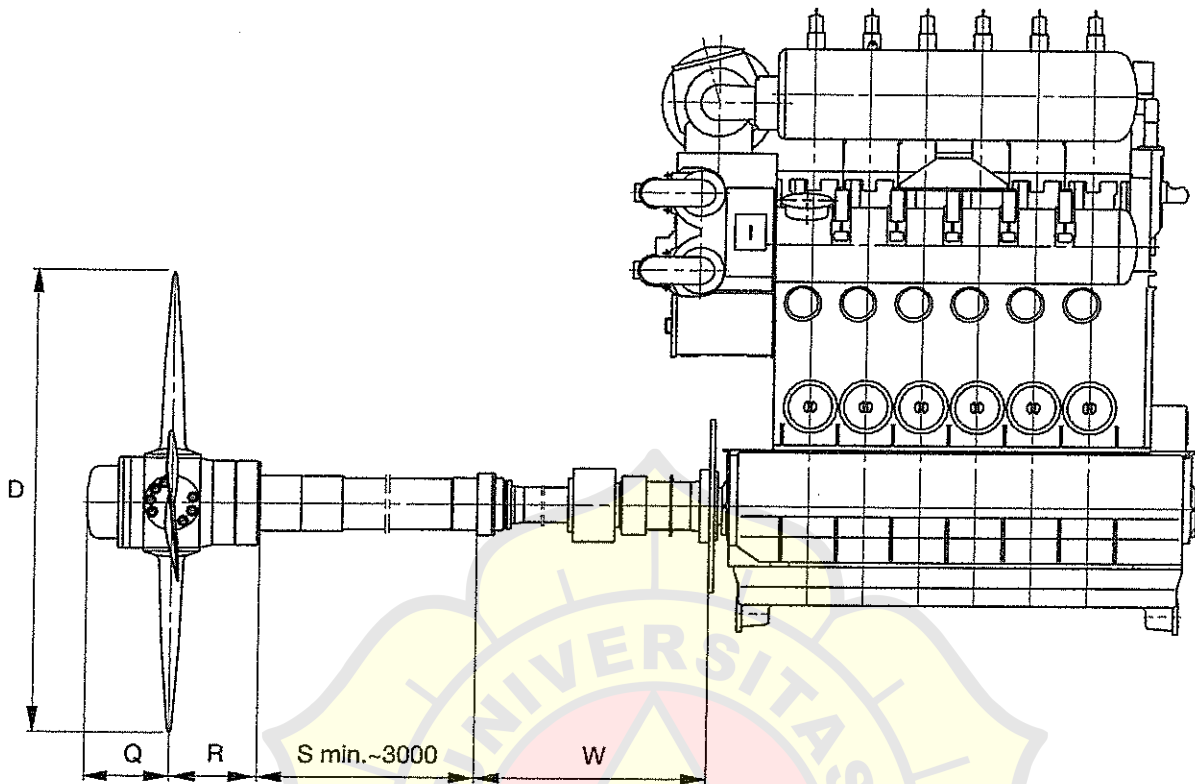


Fig. 1.05g: Fuel and lubricating oil consumption

178 46 79-2.1



178 22 24-0.0

	Cyl.	kW	Propeller speed r/min	D mm	Hub VBS mm	Q mm	R mm	W _{min} mm	Propeller mass* ton
S60MC-C	4	9,020	105	5,850	1,460	1,100	1,170	2,676	35.2
	5	11,275	105	6,150	1,560	1,175	1,257	2,919	43.5
	6	13,530	105	6,450	1,680	1,278	1,338	2,976	53.3
	7	15,785	105	6,700	1,800	1,360	1,400	3,000	58.4
	8	18,040	105	6,950	1,940	1,460	1,450	3,200	68.1

S60MC	4	8,160	105	5,650	1,460	1,100	1,170	2,676	34.1
	5	10,200	105	6,000	1,560	1,175	1,242	2,676	39.2
	6	12,240	105	6,300	1,680	1,278	1,333	2,919	47.9
	7	14,280	105	6,550	1,680	1,278	1,338	2,976	54.0
	8	16,320	105	6,800	1,800	1,360	1,400	3,000	59.0

*The masses are stated for 3,000 mm stern tube and 6,000 mm propeller shaft.

198 30 06-0.0

Fig. 5.05.02a: MAN B&W controllable pitch propeller

	Cyl.	kW	Propeller speed r/min	D mm	Hub VBS mm	Q mm	R mm	W _{min} mm	Propeller mass* ton
S42MC	4	4,320	136	4,350	1,080	821	945	2,170	16.5
	5	5,400	136	4,600	1,180	855	996	2,265	20.1
	6	6,480	136	4,850	1,280	957	1,075	2,511	24.4
	7	7,560	136	5,050	1,280	957	1,075	2,511	27.5
	8	8,640	136	5,200	1,380	1,030	1,131	2,676	30.5
	9	9,720	136	5,350	1,380	1,030	1,131	2,676	32.7
	10	10,800	136	5,500	1,460	1,100	1,170	2,676	36.0
	11	11,880	136	5,650	1,460	1,100	1,185	2,595	38.4
12	12,960	136	5,750	1,560	1,175	1,257	2,595	42.4	

L42MC	4	3,980	176	3,750	980	746	805	2,040	12.0
	5	4,975	176	4,000	1,080	825	880	2,140	15.2
	6	5,970	176	4,200	1,180	900	940	2,140	16.4
	7	6,965	176	4,350	1,180	900	940	2,160	22.7
	8	7,960	176	4,500	1,280	975	1,035	2,200	23.1
	9	8,955	176	4,600	1,280	975	1,035	2,200	23.6
	10	9,950	176	4,700	1,280	975	1,035	2,200	26.2
	11	10,945	176	4,800	1,380	1,050	1,095	2,270	29.9
12	11,940	176	4,900	1,380	1,050	1,095	2,270	30.5	

S35MC	4	2,960	173	3,550	860	653	742	2,000	9.6
	5	3,700	173	3,750	980	746	807	2,040	12.5
	6	4,440	173	3,950	980	746	807	2,170	14.0
	7	5,180	173	4,100	1,080	821	945	2,170	16.6
	8	5,920	173	4,250	1,080	821	945	2,265	18.5
	9	6,660	173	4,350	1,180	885	996	2,265	20.4
	10	7,400	173	4,450	1,180	885	996	2,265	21.1
	11	8,140	173	4,550	1,280	957	1,075	2,511	24.8
12	8,880	173	4,650	1,280	957	1,075	2,676	27.4	

L35MC	4	2,600	210	3,150	860	655	735	1,970	9.1
	5	3,250	210	3,300	860	655	735	2,000	9.5
	6	3,900	210	3,450	980	746	785	2,000	10.3
	7	4,550	210	3,600	980	746	785	2,040	11.8
	8	5,200	210	3,700	980	746	805	2,040	12.3
	9	5,850	210	3,800	1,080	825	880	2,140	13.9
	10	6,500	210	3,900	1,080	825	880	2,140	14.7
	11	7,150	210	4,000	1,180	900	940	2,140	16.5
12	7,800	210	4,100	1,180	900	940	2,140	17.2	

S26MC	4	1,600	250	2,600	740	569	655	1,940	5.5
	5	2,000	250	2,750	740	569	655	1,940	6.4
	6	2,400	250	2,850	740	569	655	1,940	7.2
	7	2,800	250	2,950	860	655	735	1,970	8.5
	8	3,200	250	3,050	860	655	735	1,970	9.3

*The masses are stated for 3,000 mm stern tube and 6,000 mm propeller shaft.

Fig. 5.05.02c: MAN B&W controllable pitch propeller

S26MC

		Cyl.	4	5	6	7	8	9	10	11	12		
Nominal MCR at 250 r/min		kW	1600	2000	2400	2800	3200	3600	4000	4400	4800		
Pumps	Fuel oil circulating pump	m ³ /h	1.5	1.8	2.0	2.4	2.7	3.0	3.3	3.6	3.9		
	Fuel oil supply pump	m ³ /h	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.2	1.3		
	Jacket cooling water pump	m ³ /h	1)	16	20	24	28	32	36	40	44	48	
			2)	16	20	24	28	32	36	40	44	48	
			3)	24	28	25	29	49	53	55	47	51	
			4)	16	20	24	28	32	36	40	44	48	
	Seawater cooling pump*	m ³ /h	1)	72	89	110	125	145	160	180	195	215	
			2)	73	90	110	125	145	160	180	195	215	
			3)	75	92	110	125	150	165	185	195	210	
			4)	72	89	110	125	140	160	180	195	210	
	Lubricating oil pump*	m ³ /h	1)	360	450	540	630	720	810	900	990	1090	
			2)	365	455	540	630	720	810	910	1000	1090	
			3)	360	450	540	630	720	810	900	990	1080	
			4)	360	450	540	630	720	810	900	990	1080	
	Coolers	Scavenge air cooler	kW	570	710	850	990	1130	1270	1420	1560	1700	
		Heat dissipation approx.											
Seawater		m ³ /h	45	56	68	79	90	101	112	123	134		
Lubricating oil cooler		Heat dissipation approx.*	kW	1)	220	275	340	390	460	510	550	600	680
				2)	230	290	340	390	450	500	580	630	680
				3)	200	250	300	350	400	450	500	550	600
				4)	225	275	325	375	425	475	550	600	650
Lubricating oil*		m ³ /h	See above 'Main lubricating oil pump'										
Seawater		m ³ /h	1)	27	33	42	46	55	59	68	72	81	
			2)	28	34	42	46	55	59	68	72	81	
			3)	30	36	42	46	60	64	73	72	76	
			4)	27	33	42	46	50	59	68	72	76	
Jacket water cooler		Heat dissipation approx.	kW	1)	310	385	460	540	620	690	770	850	920
				2)	310	385	460	540	620	690	770	850	920
				3)	395	470	485	560	810	880	940	890	970
				4)	310	385	460	540	620	690	770	850	920
Jacket cooling water	m ³ /h	See above 'Jacket cooling water pump'											
Seawater	m ³ /h	See above 'Seawater quantity' for lube oil cooler											
Fuel oil heater	kW	39	47	52	63	71	79	87	94	100			
Exhaust gas flow at 265 °C**	kg/h	12400	15500	18600	21700	24800	27900	31000	34100	37200			
Air consumption of engine	kg/s	3.4	4.2	5.0	5.9	6.7	7.6	8.4	9.3	10.1			

* For main engine arrangements with built-on power take off (PTO) of an MAN B&W recommended type and/or torsional vibration damper the engine's capacities must be increased by those stated for the actual system
 ** The exhaust gas amount and temperature must be adjusted according to the actual plant specification

1) Engines with MAN B&W turbochargers 3) Engines with ABB turbochargers, type VTR
 2) Engines with ABB turbochargers, type TPL 4) Engines with Mitsubishi turbochargers

178 42 72-8.2

Fig. 6.01.07i: List of capacities, S26MC with **conventional turbocharger** and **seawater system** stated at the nominal MCR power (L1) for engines complying with IMO's NO_x emission limitations

Starting air system: 30 bar (gauge)

Cylinder No.	4	5	6	7	8	9	10	11	12	13	14
--------------	---	---	---	---	---	---	----	----	----	----	----

S35MC

Reversible engine											
Receiver volume (12 starts) m ³	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 2.0	2 x 2.0	2 x 2.0	2 x 2.0	2 x 2.0	2 x 2.0	
Compressor capacity, total m ³ /h	90	90	90	90	120	120	120	120	120	120	
Non-reversible engine											
Receiver volume (6 starts) m ³	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	
Compressor capacity, total m ³ /h	60	60	60	60	60	60	60	60	60	60	

L35MC

Reversible engine											
Receiver volume (12 starts) m ³	2 x 1.0	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	2 x 1.5	
Compressor capacity, total m ³ /h	60	90	90	90	90	90	90	90	90	90	
Non-reversible engine											
Receiver volume (6 starts) m ³	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	
Compressor capacity, total m ³ /h	60	60	60	60	60	60	60	60	60	60	

S26MC

Reversible engine											
Receiver volume (12 starts) m ³	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	2 x 1.0	
Compressor capacity, total m ³ /h	60	60	60	60	60	60	60	60	60	60	
Non-reversible engine											
Receiver volume (6 starts) m ³	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	2 x 0.5	
Compressor capacity, total m ³ /h	30	30	30	30	30	30	30	30	30	30	

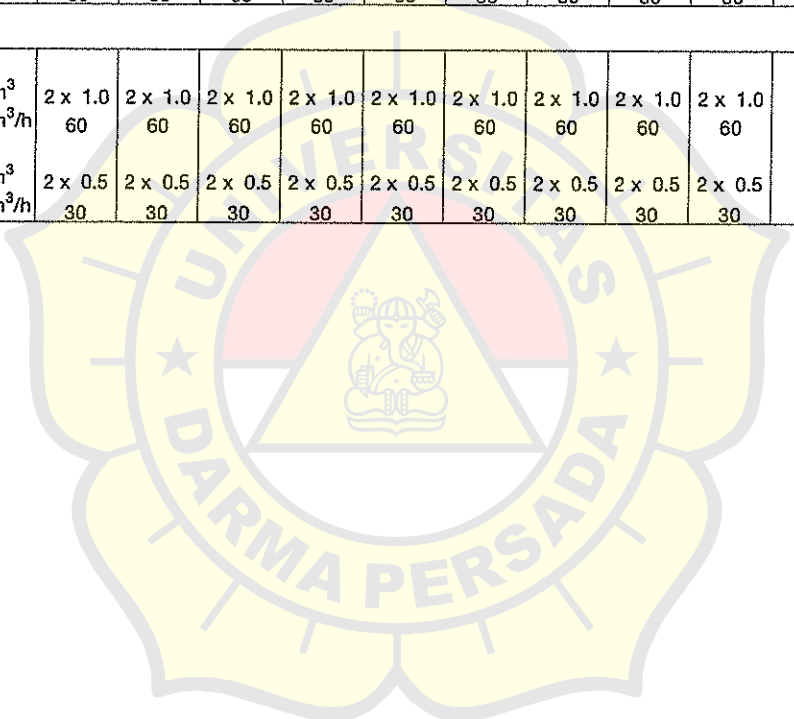


Fig. 6.01.09e: Capacities of starting air receivers and compressors for main engine

178 87 96-3.1

No. of cyl.	4	5	6	7	8	9	10	11	12
-------------	---	---	---	---	---	---	----	----	----

Firing order	1-3-2-4	1-4-3-2-5	1-5-3-4-2-6	1-7-2-5-4-3-6	1-8-3-4-7-2-5-6	1-9-2-5-7-3-6-4-8	1-8-5-7-2-9-4-6-3-10	Uneven	1-8-12-4-2-9-10-5-3-7-11-6
--------------	---------	-----------	-------------	---------------	-----------------	-------------------	----------------------	--------	----------------------------

External forces in kN

	0	0	0	0	0	0	0	0	0
--	---	---	---	---	---	---	---	---	---

External moments in kNm

Order:									
1st a	57 b	18	0	11	36	34	21	23	0
2nd	147	183	127	37	0	54	27	31	0
4th	0	1	7	19	8	28	6	15	13

Guide force H-moments in kNm

Order:									
1st	0	0	0	0	0	0	0	0	0
2nd	0	0	0	0	0	0	0	0	0
3rd	0	0	0	0	0	0	0	12	0
4th	87	0	0	0	0	0	0	29	0
5th	0	89	0	0	0	0	0	15	0
6th	0	0	70	0	0	0	0	17	0
7th	0	0	0	57	0	0	0	26	0
8th	21	0	0	0	42	0	0	21	0
9th	0	0	0	0	0	28	0	2	0
10th	0	10	0	0	0	0	21	4	0
11th	0	0	0	0	0	0	0	8	0
12th	3	0	4	0	0	0	0	2	8

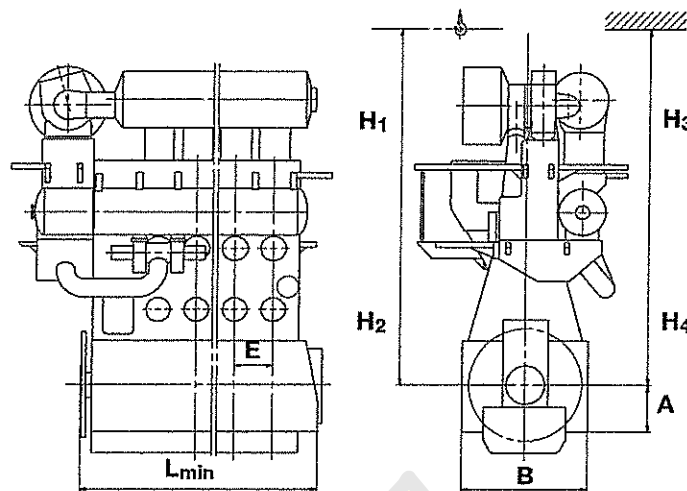
Guide force X-moments in kNm

Order:									
1st	31	10	0	6	19	18	11	12	0
2nd	7	8	6	2	0	2	1	1	0
3rd	6	20	36	40	51	30	38	91	114
4th	0	4	33	93	38	137	29	75	65
5th	11	0	0	8	97	112	193	68	0
6th	20	2	0	1	0	39	16	6	0
7th	5	18	0	0	3	5	33	6	0
8th	0	11	8	1	0	2	2	42	16
9th	2	1	12	1	1	0	1	7	39
10th	4	0	3	9	0	1	0	6	0
11th	1	0	0	5	7	1	0	8	0
12th	0	1	0	0	1	2	0	2	0

- a) 1st order moments are, as standard, balanced so as to obtain equal values for horizontal and vertical moments for all cylinder numbers.
- b) By means of the adjustable counterweights on 4-cylinder engines, 70% of the 1st order moment can be moved from horizontal to vertical direction or vice versa, if required.

178 41 28-1.1

Fig. 7.09.27: External forces and moments in layout point L₁ for S26MC



178 16 76-0.0

	S50MC-C	S50MC	L50MC	S46MC-C	S42MC	L42MC	S35MC	L35MC	S26MC
Dimensions in mm									
A	1085	1085	944	986	900	690	650	550	420
B	3150	2950	2710	2924	2670	2460	2200	1980	1880
E	850	890	890	782	748	748	600	600	490
H1	8950	8800	7825	8600	8050	6700	6425	5200	4825
H2	8375	8250	7325	8075	7525	6250	6050	4850	4725
H3	8150	8100	7400	7850	7300	6350	5925	5025	4525
H4							5850	4825	4500
Lmin									
4 cyl.	4695	5280	5280	4317	4198	4406	3520	3485	2970
5 cyl.	5542	6170	6170	5099	4946	5154	4120	4085	3460
6 cyl.	6392	7060	7060	5881	5694	5902	4720	4685	3950
7 cyl.	7242	7950	7950	6663	6442	6650	5320	5285	4440
8 cyl.	8092	8840	8840	7445	7190	7398	5920	5885	4930
9 cyl.					7938	8146	6520	6485	5420
10 cyl.					9434	9642	7720	7685	6400
11 cyl.					10182	10390	8320	8285	6890
12 cyl.					10930	11138	8920	8885	7380
Dry masses in tons									
4 cyl.	155	171	163	133	109	95	57	50	32
5 cyl.	181	195	188	153	125	110	65	58	37
6 cyl.	207	225	215	171	143	125	75	67	42
7 cyl.	238	255	249	197	160	143	84	75	48
8 cyl.	273	288	276	217	176	158	93	83	53
9 cyl.					195	176	103	92	58
10 cyl.					232	210	119	111	68
11 cyl.					249	229	133	120	74
12 cyl.					269	244	144	128	79

The distances H₁ and H₂ are from the centre of the crankshaft to the crane hook. The distances H₃ and H₄ for the double jib crane are from the centre of the crankshaft to the lower edge of the deck beam.

E - Cylinder distance H₁ - Vertical lift H₂ - Tilted lift H₃ - Electrical double jib crane H₄ Manual double jib crane

Fig. 5.01.01c: Space requirements and masses

178 87 19-9.1

Lifting capacity in tons		
Engine type	For normal overhaul	For double jib crane
K98MC	12.5	2 x 6.3
K98MC-C	12.5	2 x 6.3
S90MC-C	10.0	2 x 5.0
L90MC-C	10.0	2 x 5.0
K90MC	10.0	2 x 5.0
K90MC-C	10.0	2 x 5.0
S80MC-C	10.0	2 x 5.0
S80MC	8.0	2 x 4.0
L80MC	8.0	2 x 4.0
K80MC-C	6.3	2 x 4.0
S70MC-C	6.3	2 x 3.0
S70MC	5.0	2 x 2.5
L70MC-C	6.3	2 x 3.0
L70MC	5.0	2 x 2.5
S60MC-C	4.0	2 x 2.0
S60MC	3.2	2 x 1.6
L60MC-C	4.0	2 x 2.0
L60MC	3.2	2 x 1.6
S50MC-C	2.0	2 x 1.6
S50MC	2.0	2 x 1.0
L50MC	1.6	2 x 1.0
S46MC-C	2.0	2 x 1.0
S42MC	1.25	2 x 1.0
L42MC	1.25	2 x 1.0
S35MC	0.8	2 x 0.5
L35MC	0.63	2 x 0.5
S26MC	0.5	2 x 0.5

178 87 20-8.1

Fig. 5.01.02: Engine room crane capacities for overhaul