



**ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΝΑΥΤΙΛΙΑΣ ΚΑΙ ΝΗΣΙΩΤΙΚΗΣ ΠΟΛΙΤΙΚΗΣ**

ΓΕΝΙΚΗ ΔΙΕΥΘΥΝΣΗ ΟΙΚΟΝΟΜΙΚΩΝ ΥΠΗΡΕΣΙΩΝ
ΔΙΕΥΘΥΝΣΗ ΠΡΟΜΗΘΕΙΩΝ & ΕΠΟΠΤΕΙΑΣ ΑΠΟΘΗΚΩΝ
Τμήμα 2° Υλοποίησης Προμηθειών Τακτικών Διαγωνισμών
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**ΚΑΤΑΧΩΡΙΣΤΕΑ ΣΤΟ ΜΗΤΡΩΟ
ΑΝΑΡΤΗΤΕΑ ΣΤΟ ΔΙΑΔΙΚΤΥΟ**



ΕΥΡΩΠΑΪΚΗ ΕΝΩΣΗ

Πειραιάς, 29 Μαΐου 2020
Αριθ. Πρωτ.: 2832.5/32071/2020

ΘΕΜΑ: Παράταση της προθεσμίας παραλαβής προσφορών της αριθ. 02/2020 Διακήρυξης ΥΝΑΝΠ/ΓΔΟΥ/ΔΙΠΕΑ 2° για την «Προμήθεια υλικών και ανταλλακτικών για τη συντήρηση των Πλωτών Μέσων Λ.Σ.-ΕΛ.ΑΚΤ.», με α/α συστήματος -90609-, συνολικής εκτιμώμενης αξίας σύμβασης επτά εκατομμυρίων ευρώ #7.000.000,00€# (απαλλάσσεται ΦΠΑ), με κριτήριο κατακύρωσης την πλέον συμφέρουσα από οικονομική άποψη προσφορά μόνο βάσει τιμής.

**Ο Υπουργός Ναυτιλίας και
Νησιωτικής Πολιτικής**

Έχοντας υπ' όψιν:

1. **Τις διατάξεις** όπως αυτές ισχύουν:
 - α) Του **N.4169 της 15/18 Μαΐου 1961** «Περί Γεωργικών Κοινωνικών Ασφαλίσεων» (Α' 81), όπως τροποποιήθηκε και ισχύει,
 - β) Του **N.2121/1993** «Πνευματική Ιδιοκτησία, Συγγενικά Δικαιώματα και Πολιτιστικά Θέματα» (Α' 25),
 - γ) Του **N.2513/1997** περί «Κυρώσεως της συμφωνίας Δημοσίων συμβάσεων προμηθειών» (Α' 139).
 - δ) Του **N.2690/1999** «Κύρωση του Κώδικα Διοικητικής Διαδικασίας και άλλες διατάξεις» (Α' 45), όπως τροποποιήθηκε και ισχύει,
 - ε) Του **N.2859/00** «Κύρωση Κώδικα Φόρου Προστιθέμενης Αξίας» (Α' 248), όπως τροποποιήθηκε και ισχύει,
 - στ) Του **N.3310/2005 (Α' 30)** «Μέτρα για τη διασφάλιση της διαφάνειας και την αποτροπή καταστρατηγήσεων κατά τη διαδικασία σύναψης δημοσίων συμβάσεων» για τη διασταύρωση των στοιχείων του αναδόχου με τα στοιχεία του Ε.Σ.Ρ., του π.δ/τος 82/1996 (Α' 66) «Ονομαστικοποίηση μετοχών Ελληνικών Ανωνύμων Εταιρειών που μετέχουν στις διαδικασίες ανάληψης έργων ή προμηθειών του Δημοσίου ή των νομικών προσώπων του ευρύτερου δημόσιου τομέα» 1, της κοινής απόφασης των Υπουργών Ανάπτυξης και Επικρατείας με αρ. 20977/2007 (Β' 1673) σχετικά με τα «Δικαιολογητικά για την τήρηση των μητρώων του Ν.3310/2005, όπως τροποποιήθηκε με το Ν.3414/2005», καθώς και

¹ Η υποχρέωση ονομαστικοποίησης μετοχών εταιρειών που συνάπτουν δημόσιες συμβάσεις, απαιτείται σύμφωνα με το άρθρο 8 του Ν. 3310/2005, σε διαδικασίες σύναψης δημοσίων συμβάσεων εκτιμώμενης αξίας ανώτερης του ενός εκατομμυρίου ευρώ (1.000.000,00 €).

της απόφασης του Υφυπουργού Οικονομίας και Οικονομικών με αριθμ.1108437/2565/ΔΟΣ/2005 (Β' 1590) «Καθορισμός χωρών στις οποίες λειτουργούν εξωχώριες εταιρίες»,

ζ) Την υπ' αριθμ. Φ.1//2005/14-02-2005 (ΥΑ Φ.120/1/136775 Σ.486 ΦΕΚ Β 336 2005) Απόφαση του Υπουργού Εθνικής Άμυνας «Κύρωση από το Γενικό Επιτελείο Εθνικής Άμυνας του Κανονισμού Βιομηχανικής Ασφαλείας (ΕΚΒΑ)» (ΦΕΚ Β' 336), όπως ισχύει,

η) Του Ν.3861/2010 «Ενίσχυση της διαφάνειας με την υποχρεωτική ανάρτηση νόμων και πράξεων των κυβερνητικών, διοικητικών και αυτοδιοικητικών οργάνων στο διαδίκτυο "Πρόγραμμα Διαύγεια" και άλλες διατάξεις» (Α' 112),

θ) Του Ν.4013/2011 «Σύσταση ενιαίας Ανεξάρτητης Αρχής Δημοσίων Συμβάσεων και Κεντρικού Ηλεκτρονικού Μητρώου Δημοσίων Συμβάσεων...» (Α' 204),

ι) Του άρθρου 26 του Ν.4024/2011 «Συγκρότηση συλλογικών οργάνων της διοίκησης και ορισμός των μελών τους με κλήρωση» (Α' 226),

ια) Του Ν. 4150/13 «Ανασυγκρότηση του Υπουργείου Ναυτιλίας και Αιγαίου και άλλες διατάξεις» (Α' 102),

ιβ) Του Ν.4152/2013 «Επείγοντα μέτρα εφαρμογής των νόμων 4046/2012, 4093/2012 και 4127/2013» και ειδικότερα της Παραγράφου Ζ': Προσαρμογή της Ελληνικής νομοθεσίας στην Οδηγία 2011/07 της 16 Φεβρουαρίου 2011 για την καταπολέμηση των καθυστερήσεων πληρωμών στις εμπορικές συναλλαγές (Α' 107),

ιγ) Του Ν.4172/2013 «Φορολογία εισοδήματος, επείγοντα μέτρα εφαρμογής του Ν. 4046/2012, του Ν. 4093/2012 και του Ν. 4127/2013 και άλλες διατάξεις» (Α' 167), όπως τροποποιήθηκε και ισχύει,

ιδ) Του Ν.4250/2014 «Διοικητικές Απλουστεύσεις - Καταργήσεις, Συγχωνεύσεις Νομικών Προσώπων και Υπηρεσιών του Δημοσίου Τομέα - Τροποποίηση Διατάξεων του π.δ. 318/1992 (Α' 161) και λοιπές ρυθμίσεις» (Α' 74), όπως τροποποιήθηκε και ισχύει,

ιε) Του Ν.4270/2014 «Αρχές δημοσιονομικής διαχείρισης και εποπτείας (ενσωμάτωση της Οδηγίας 2011/85/ΕΕ) - δημόσιο λογιστικό και άλλες διατάξεις» (Α' 143), όπως τροποποιήθηκε και ισχύει,

ιστ) Του Ν.4314/2014 «Α) Για τη διαχείριση, τον έλεγχο και την εφαρμογή αναπτυξιακών παρεμβάσεων για την προγραμματική περίοδο 2014-2020, Β) Ενσωμάτωση της Οδηγίας 2012/17 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 13ης Ιουνίου 2012 (ΕΕ L 156/16.6.2012) στο ελληνικό δίκαιο, τροποποίηση του Ν. 3419/2005 (Α' 297) και άλλες διατάξεις» (Α' 265) και του Ν. 3614/2007 «Διαχείριση, έλεγχος και εφαρμογή αναπτυξιακών παρεμβάσεων για την προγραμματική περίοδο 2007 -2013» (Α' 267),

ιζ) Του Ν.4412/2016 «Δημόσιες Συμβάσεις Έργων, Προμηθειών και Υπηρεσιών (προσαρμογή στις Οδηγίες 2014/24/ ΕΕ και 2014/25/ΕΕ)» (Α' 147), όπως τροποποιήθηκε και ισχύει,

ιη) Του Ν.4504/2017 «Δια βίου εκπαίδευση προσωπικού Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής, (...) συμπλήρωση διατάξεων για τα λιμενικά έργα και άλλες διατάξεις» (Α' 184), και ειδικότερα των διατάξεων των άρθρων 52-57 του Μέρους Δ', 'Στρατηγικός Επιχειρησιακός Σχεδιασμός Λ.Σ.-ΕΛ.ΑΚΤ", και ότι δεν έχει καθοριστεί μέχρι σήμερα, κατ' άρθρο 52 του νόμου αυτού, η Δομή Δυνάμεων του Λ.Σ.- ΕΛ.ΑΚΤ",

ιθ) Του Ν.4624/2019 «Αρχή Προστασίας Δεδομένων Προσωπικού Χαρακτήρα, μέτρα εφαρμογής του Κανονισμού (ΕΕ) 2016/679 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 27ης Απριλίου 2016 για την προστασία των φυσικών προσώπων έναντι της επεξεργασίας δεδομένων προσωπικού χαρακτήρα και ενσωμάτωση στην εθνική νομοθεσία της Οδηγίας (ΕΕ) 2016/680 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 27ης Απριλίου 2016 και άλλες διατάξεις» (Α' 137),

κ) Του Π.Δ. 28/28 Ιουλίου 1931 «Περί Κώδικος των νόμων περί τελών χαρτοσήμου» (Α' 239), όπως τροποποιήθηκε και ισχύει,

κα) Του Π.Δ. 63/05 «Κωδικοποίηση της νομοθεσίας για την Κυβέρνηση και τα κυβερνητικά όργανα» (Α' 98), όπως τροποποιήθηκε και ισχύει,

κβ) Του Π.Δ. 28/2015 «Κωδικοποίηση διατάξεων για την πρόσβαση σε δημόσια έγγραφα και στοιχεία» (Α' 34),

κγ) Του Π.Δ. 70/2015 «(...) Ανασύσταση του Υπουργείου Ναυτιλίας και Αιγαίου και μετονομασία του σε Υπουργείο Ναυτιλίας και Νησιωτικής Πολιτικής (...)» (Α' 114),

κδ) Του Π.Δ. 80/2016 «Ανάληψη υποχρεώσεων από τους διατάκτες» (Α' 145),

κε) Του Π.Δ. 39/2017 «Κανονισμός εξέτασης Προδικαστικών Προσφυγών ενώπιον της Αρχής Εξέτασης Προδικαστικών Προσφυγών» (Α' 64),

κστ) Του Π.Δ. 13/2018 «Οργανισμός Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής» (Α' 26),

κζ) Του Π.Δ. 88/2018 «Διορισμός Υπουργών, Αναπληρωτών Υπουργών και Υφυπουργών» (Α' 160),

κη) Τους Κανονισμούς 1303/2013 και 1304/2013 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου, όπως ισχύουν, και

κθ) Του Π.Δ. 83/2019 «Διορισμός Αντιπροέδρου της Κυβέρνησης, Υπουργών, Αναπληρωτών Υπουργών και Υφυπουργών» (Α' 121).

2. Τις Αποφάσεις:

Ανήκει στην υπ' αριθμ. 02/2020 Διακήρυξη Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής/ ΓΔΟΥ/ ΔΙΠΕΑ 2°

- α) Την υπ' αριθ. **Π1/2489/1995** Απόφαση του Υπουργού Εμπορίου «*Συγκρότηση και λειτουργία των Επιτροπών Παραλαβής υλικών. Διαδικασία Παραλαβής*» (Β' 764),
- β) Την υπ' αριθ. **2/51557/0026/2001** Απόφαση του Υπουργού Οικονομικών «*Περί καθορισμού επιτοκίου των προκαταβολών για προμήθεια προϊόντων, παροχή υπηρεσιών ή εκτέλεση έργων*» (Β' 1209),
- γ) Την υπ' αριθ. **20977/2007** Κ.Υ.Α. των Υπουργών Ανάπτυξης και Επικρατείας «*Δικαιολογητικά για την τήρηση των μητρώων του Ν. 3310/2005, όπως τροποποιήθηκε με το Ν. 3414/2005*» (Β' 1673),
- δ) Την υπ' αριθ. **134453/2015** απόφαση Υπουργών Οικονομικών και Ανάπτυξης & Ανταγωνιστικότητας «*Ρυθμίσεις για τις πληρωμές των δαπανών του συγχρηματοδοτούμενου σκέλους του Προγράμματος Δημοσίων Επενδύσεων*» (Β' 2857),
- ε) Την υπ' αριθ. **1191/14-3-2017** ΚΥΑ περί «*Καθορισμού του χρόνου, τρόπου υπολογισμού της διαδικασίας [παρακράτησης και απόδοσης της κράτησης 0,06% υπέρ της ΑΕΠΠ (...)]*» (Β' 969),
- στ) Την υπ' αριθ. **57654/22-05-2017** Υπουργικής Απόφασης «*Ρύθμιση ειδικότερων θεμάτων λειτουργίας και διαχείρισης του Κεντρικού Ηλεκτρονικού Μητρώου Δημοσίων Συμβάσεων (ΚΗΜΔΗΣ) του Υπουργείου Οικονομίας και Ανάπτυξης*» (Β' 1781),
- ζ) Την υπ' αριθ. **56902/215/2017** Απόφαση του Υπουργού Οικονομίας και Ανάπτυξης «*Τεχνικές λεπτομέρειες και διαδικασίες λειτουργίας του Εθνικού Συστήματος Ηλεκτρονικών Δημοσίων Συμβάσεων (Ε.Σ.Η.Δ.Η.Σ.)*» (Β' 1924),
- η) Την υπ' αριθ. **3/2018 (ΑΔΑ:ΩΥΟΝΟΡΡΕ-5Ν4)** Γνωμοδότηση του Δ' Τμήματος του Νομικού Συμβουλίου του Κράτους,
- θ) Την υπ' αριθ. πρωτ.: **2831.8-1/57900/2019/01-08-2019** Απόφαση ΥΝΑΝΠ/ΓΔΟΥ/ΔΙ.Π.Ε.Α. 1° (ΑΔΑ: 7ΝΓ3463ΠΩ-1ΨΩ) με θέμα «*Συγκρότηση Επιτροπών (i) Διενέργειας των διαδικασιών σύναψης Δημοσίων Συμβάσεων, (ii) Αξιολόγησης Ενστάσεων και Προσφυγών σε θέματα προμηθειών, (iii) Παρακολούθησης-Παραλαβής Συμβάσεων Προμηθειών και Παραλαβής Συμβάσεων Παροχής Υπηρεσιών, έτους 2019-2020 του Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής*», όπως έχει τροποποιηθεί και ισχύει και
- ι) Την υπ' αριθ. **137675/ΕΥΘΥ1016/19-12-2018** «Αντικατάσταση της υπ' αριθ. 110427/ΕΥΘΥ1020/20.10.2016 (ΦΕΚ Β' 3521) Υπουργικής απόφασης με τίτλο «Τροποποίηση και αντικατάσταση της υπ' αριθμ. 81986/ΕΥΘΥ712/31.7.2015 (ΦΕΚ Β' 1822) Υπουργικής Απόφασης «Εθνικοί Κανόνες Επιλεξιμότητας δαπανών για τα προγράμματα του ΕΣΠΑ 2014-2020 – Έλεγχος νομιμότητας δημοσίων συμβάσεων συγχρηματοδοτούμενων πράξεων ΕΣΠΑ 2014-2020 από Αρχές Διαχείρισης και Ενδιάμεσους Φορείς – Διαδικασία ενστάσεων επί των αποτελεσμάτων αξιολόγησης πράξεων» (Β' 5968),

τις σε εκτέλεση των ανωτέρω νόμων εκδοθείσες κανονιστικές πράξεις, τις λοιπές διατάξεις που αναφέρονται ρητά ή απορρέουν από τα οριζόμενα στα συμβατικά τεύχη της παρούσας, καθώς και το σύνολο των διατάξεων του ασφαλιστικού, εργατικού, κοινωνικού, περιβαλλοντικού και φορολογικού δικαίου που διέπει την ανάθεση και εκτέλεση της παρούσας σύμβασης, έστω και αν δεν αναφέρονται ρητά παραπάνω.

3. Την αριθ. **02/2020** με αριθ.πρωτ: **2832.9/24043/2020/22-04-2020** διακήρυξη ηλεκτρονικού, ανοικτού, διεθνούς Διαγωνισμού (συστημικός αριθμός: **90609**) για την «**Προμήθεια υλικών και ανταλλακτικών για τη συντήρηση των Πλωτών Μέσων Λ.Σ.-ΕΛ.ΑΚΤ.**», με α/α συστήματος **-90609-**, συνολικής εκτιμώμενης αξίας σύμβασης επτά εκατομμυρίων ευρώ #7.000.000,00€# (απαλλάσσεται ΦΠΑ), με κριτήριο κατακύρωσης την πλέον συμφέρουσα από οικονομική άποψη προσφορά μόνο βάσει τιμής.
4. Το από 20-05-2020 ώρας 09:24:39 μήνυμα μέσω ΕΣΗΔΗΣ με επισυναπτόμενο αίτημα παράτασης χρόνου υποβολής προσφορών της εταιρείας «MPD GREECE ΜΟΝΟΠΡΟΣΩΠΗ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΕΜΠΟΡΙΑ ΕΠΙΣΚΕΥΕΣ ΚΑΙ ΣΥΝΤΗΡΗΣΗ ΚΙΝΗΤΗΡΩΝ ΚΑΙ ΜΗΧΑΝΩΝ».
5. Το από 20-05-2020 και ώρα 13:32 μήνυμα ηλεκτρονικού ταχυδρομείου Επιτελικής Δομής ΕΣΠΑ ΥΝΑΝΠ.
6. Το αριθ.πρωτ. **2832/29887/2020/21-05-2020** ΦΕΣ ΔΕΜ.

Αποφασίζουμε

Την παράταση της καταληκτικής προθεσμίας παραλαβής προσφορών της υπ' αριθ. 02/2020 διακήρυξης του ΥΝΑΝΠ/ΓΔΟΥ/ΔΙΠΕΑ 2° με αριθμ. πρωτ.: **2832.9/24043/2020/22-04-2020** (ΑΔΑΜ:20PROC006618068, ΑΔΑ:ΩΘ484653ΠΩ-Ψ76), με την οποία προκηρύχθηκε ηλεκτρονικός, ανοικτός, διεθνής διαγωνισμός για την «**Προμήθεια υλικών και ανταλλακτικών για τη συντήρηση των Πλωτών Μέσων Λ.Σ.-ΕΛ.ΑΚΤ.**», προϋπολογισθείσας αξίας επτά εκατομμυρίων ευρώ #7.000.000,00€# (απαλλάσσεται ΦΠΑ), χωρίς τροποποίηση των όρων της διακήρυξης, λόγω μη δημοσίευσης των Προσαρτημάτων Α', Β', Γ', Δ', Ε', ΣΤ', Ζ' επί των Τεχνικών Προδιαγραφών του Παραρτήματος Α' της αριθ.02/2020 Διακήρυξης, προκειμένου λάβουν γνώση επί αυτών οι

συμμετέχοντες οικονομικοί φορείς στον εν λόγω διαγωνισμό, η οποία ζητήθηκε από τον οικονομικό φορέα (βλέπε σχετικό 4), δυνάμει του άρθρου 60 παρ.3 του Ν.4412/2016, **κατά είκοσι (20) ημέρες.**

1. Κατόπιν αυτών καταληκτική ημερομηνία και ώρα παραλαβής των προσφορών ορίζεται η Τετάρτη, **01-07-2020 και ώρα 15.00.**
2. Τη **μετάθεση** της ημερομηνίας αποσφράγισης των προσφορών για την **07-07- 2020 και ώρα 11:00.**
3. Την **παράταση** της προθεσμίας υποβολής αιτημάτων παροχής διευκρινίσεων επί των όρων της Διακήρυξης έως την **11-06-2020.**
4. Κατά τα λοιπά ισχύουν οι όροι και οι τεχνικές προδιαγραφές της υπ' αριθ. 02/2020 Διακήρυξης του ΥΝΑΝΠ/ΓΔΟΥ/ΔΙΠΕΑ 2^ο (ΑΔΑΜ:20PROC006618068_ΑΔΑ:ΩΘ484653ΠΩ-Ψ76).
5. **Επισημαίνεται** ότι κατόπιν τροποποίησης της καταληκτικής ημερομηνίας παραλαβής προσφορών και διενέργειας του διαγωνισμού, τροποποιείται η ημερομηνία των όρων που αφορούν το χρόνο ισχύος της προσφοράς και της εγγυητικής συμμετοχής στους όρους 2.2.2.1, 2.4.3.1, 2.4.5 της διακήρυξης.
6. Δίνεται εξουσιοδότηση στον Διευθυντή Προμηθειών & Εποπτείας Αποθηκών του ΥΝΑΝΠ/ΓΔΟΥ όπως προβεί στην υπογραφή ανακοίνωσης περί της νέας ημερομηνίας και ώρας υποβολής προσφορών του διαγωνισμού, προκειμένου να δημοσιευθεί αυτή στην Υπηρεσία Επισήμων Εκδόσεων της ΕΕ. Η παρούσα να καταχωρηθεί στο Κεντρικό Ηλεκτρονικό Μητρώο Δημοσίων Συμβάσεων (ΚΗΜΔΗΣ) και στον ιστότοπο <https://diavgeia.gov.gr/> (ΠΡΟΓΡΑΜΜΑ ΔΙΑΥΓΕΙΑ), καθώς και να αναρτηθεί στο διαδικτυακό τόπο του Α.ΛΣ-ΕΛ.ΑΚΤ. (www.hcg.gr) και στο διαδικτυακό τόπο του ΥΝΑΝΠ (www.ynanp.gr). Επίσης η παρούσα να καταχωρηθεί στο Εθνικό Σύστημα Ηλεκτρονικών Δημοσίων Συμβάσεων (ΕΣΗΔΗΣ) στο συστημικό αριθμό – **90609**- του διαγωνισμού και να κοινοποιηθεί για εκτέλεση.-

Ψηφιακά υπογεγραμμένο από IFIGENEIA SPYRIDOULA PAPOULIA
Ημερομηνία: 2020.06.02 10:17:12 EEST
Αιτία: Ακριβές Αντίγραφο

Ο Υπουργός

ΙΩΑΝΝΗΣ ΠΛΑΚΙΩΤΑΚΗΣ

ΕΠΙΣΥΝΑΠΤΟΝΤΑΙ:

Προσαρτήματα Α', Β', Γ', Δ', Ε', ΣΤ', Ζ'

ΠΙΝΑΚΑΣ ΔΙΑΝΟΜΗΣ (μέσω ηλεκτρονικού ταχυδρομείου)

I. ΑΠΟΔΕΚΤΕΣ ΠΡΟΣ ΕΝΕΡΓΕΙΑ

Πρόεδρος και Μέλη Επιτροπής Διενέργειας Διαδικασιών Σύναψης Συμβάσεων του Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής (μέσω του Γραμματέα αυτής)

II. ΑΠΟΔΕΚΤΕΣ ΠΡΟΣ ΚΟΙΝΟΠΟΙΗΣΗ

1. Ειδική Υπηρεσία «Επιτελική Δομή ΕΣΠΑ»/ΥΝΑΝΠ
2. Υπ.ΟΙΚ.ΑΝ./Ειδική Υπηρεσία Διαχείρισης του Ε.Π. «ΑΛΙΕΙΑ & ΘΑΛΑΣΣΑ» (μέσω Επιτελικής Δομής ΕΣΠΑ)
3. ΥΝΑΝΠ/Α.ΛΣ-ΕΛ.ΑΚΤ/ΔΕΜ
4. ΥΝΑΝΠ/ΓΔΟΥ/ΔΙΠΡΟΠ Β'
5. ΥΝΑΝΠ/ΓΔΟΥ/ΔΟΔ

III. ΕΣΩΤΕΡΙΚΗ ΔΙΑΝΟΜΗ

- | | |
|---------------------------|--|
| 1. Γρ. κ. ΥΝΑΝΠ | 4. Γρ. κ. Δ.Κ.Α' |
| 2. Γρ. κ. Α/ΛΣ-ΕΛ.ΑΚΤ. | 5. Γρ. κ. ΓΔΟΥ |
| 3. Γρ. κ. Β' Υ/ΛΣ-ΕΛ.ΑΚΤ. | 6. ΔΙΠΕΑ 1 ^ο - 4 ^ο |

ΠΡΟΣΑΡΤΗΜΑ Α

Marine

A TOGNUM GROUP BRAND

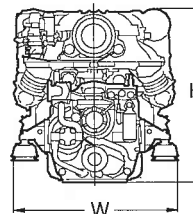
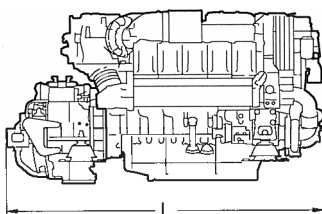
Diesel Engines 12V/16V 2000 M91

for Fast Vessels with Low Load Factors (1DS)



Dimensions and Masses

2000 M91 – with gearbox	Dimensions (LxWxH) mm (in)	Mass, dry kg (lbs)
12V/ZF 2550	2600x1400x1290 (102.4x55.1x50.8)	3260 (7197)
16V/ZF 3060	3075x1400x1290 (121.1x55.1x50.8)	3920 (8642)



Typical applications: Fast Yachts, Fast Patrol Boats, Police Craft and Fire-Fighting Vessels

Engine Model		12V 2000 M91	16V 2000 M91
Rated power ICFN	kW (bhp)	1119 (1500)	1492 (2000)
Speed	rpm	2350	2350
No. of cylinders		12	16
Bore/stroke	mm (in)	130/150 (5.1/5.9)	130/150 (5.1/5.9)
Displacement, total	l (cu in)	23.9 (1458)	31.8 (1943)
Flywheel housing		SAE 1	SAE 0
Gearbox type		ZF 2550	ZF 3060
		i = 1.2 – 2.5	i = 1.5 – 2.7
Optimization of exhaust emissions ¹⁾		IMO/EU	IMO 2 compl./EPA 2/EU

¹⁾ IMO – International Maritime Organization (MARPOL)
EPA – US Marine Directive 40 CFR 94
EU – Recreational crafts EU 94/25 EC



Power. Passion. Partnership.

Performance & Fuel Consumption		12V 2000 M91			16V 2000 M91		
Speed	rpm	2350	1800	1200	2350	1800	1200
Maximum power	kW	1119	940	500	1492	1250	790
	bhp	1500	1261	671	2000	1676	1059
Power on propeller curve ²⁾	kW	1119	500	150	1492	670	200
	bhp	1500	671	201	2000	898	268
Fuel consumption	g/kWh	222	208	217	219	206	210
	l/h	299.3	125.3	39.2	393.7	166.3	50.6
	gal/h	79.1	33.1	10.4	104.0	44.0	13.4

¹⁾ Tolerance +5% per ISO 3046, Diesel fuel to DIN EN 590 with a min L.H.V. of 42800kJ/kg (18390 BTU/lb)

²⁾ 3.0 exponent

Standard Equipment	
Starting system	Electric starter 24 V
Auxiliary PTO	Charging generator, 140A, 28V, 2 pole
Oil system	Gear driven lube oil pump, lube-oil duplex filter with diverter valve, lube-oil heat exchanger, handpump for oil extraction
Fuel system	Fuel feed pump, fuel hand pump, fuel pre-filter, fuel main filter with diverter valve, on-engine fuel oil cooler, individual HP injection pumps, jacketed HP fuel lines, injection nozzles (PLN system), flame proof hose lines, leak-off fuel tank level monitored
Cooling system	Coolant-to-raw water plate core heat exchanger, self priming centrifugal raw water pump, gear driven coolant circulation pump
Combustion air system	Sequential turbocharging with 2 water-cooled exhaust-gas turbochargers, on-engine set of combustion-air filters
Exhaust system	Triple-walled, liquid-cooled, on-engine exhaust manifolds, 2 exhaust bellows vertical discharge
Mounting system	Resilient mounts at free end
Engine management system	Engine and gearbox control and monitoring system (ADEC)

Optional Equipment	
Auxiliary PTO	Bilgepump, on-engine PTOs
Oil System	Oil replenishment system
Fuel System	Duplex fuel pre-filter
Cooling System	Integrated seawater gearbox piping
Exhaust System	2 exhaust bellows horizontal discharge
Mounting System	Resilient mounts at driving end
Engine Management System	In compliance with Classification Society Regulations (EMU + GMU)
Monitoring/Control System	blueLine , MCS-5, RCS-5
Power Transmission	Torsionally resilient coupling
Gearbox Options	Reverse reduction gearbox, el. actuated, gearbox mounts, trolling mode for dead-slow propulsion, free auxiliary PTO, hydraulic pump drives

> Power definition according ISO 3046

> Intake air depression 15 mbar/Exhaust back pressure 30 mbar

> Power reduction at 45°C/32°C: none

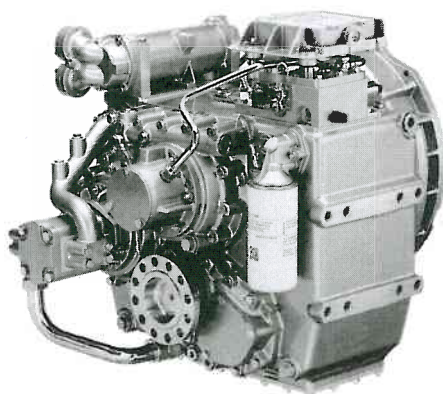
Specifications are subject to change without notice. All dimensions are approximate. For complete information refer to installations drawing. For further information consult your MTU or MTU Detroit Diesel distributor/dealer.

> Intake air temperature 25°C/Sea water temperature 25°C

> Barometric pressure 1000 mbar

ΠΡΟΣΑΡΤΗΜΑ Β

Marine Propulsion Systems



ZF 2050 A

10° Down angle, direct or remote mount marine transmission.

Maximum Input**

Duty	kW	hp	RPM
Pleasure	1231	1650	2600
Light	1073	1438	2600
Medium	791	1061	2600
Continuous	559	750	2600

** Must not be exceeded

Description

- 3 shaft, reverse reduction transmission with hydraulic clutch mounted on the input shaft and another one mounted on the reverse shaft. Input drive on opposite side to output drive.
- Non-reversing NR version also available .
- Fully works tested, reliable and simple to install .
- Suitable for high performance applications in luxury motoryachts, sport fishers, express cruisers etc .
- Design, manufacture and quality control standards comply with ISO 9001 .
- Compatible with all types of engines and propulsion systems, including waterjets and surface- piercing propellers, as applicable .

Features

- Lightweight and robust aluminum alloy casing (sea water resistant) .
- Case hardened and precisely ground gear teeth for long life and smooth running .
- Output shaft thrust bearing designed to take maximum propeller thrust astern and ahead .
- Compact, space-saving design, complete with oil cooler, pump and full flow filter .
- Smooth and reliable hydraulic shifting with electric actuation .
- Suitable for twin engine installations (same ratio and torque capacity in ahead or astern mode) .
- Emergency "get home" capability .
- "SUPERSHIFT" clutch control .

Options

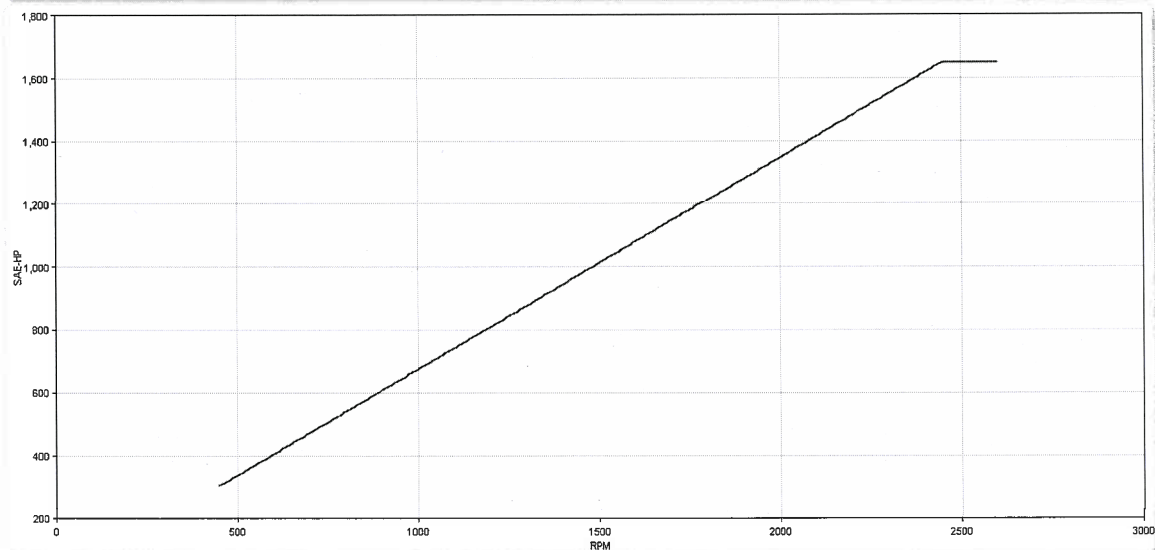
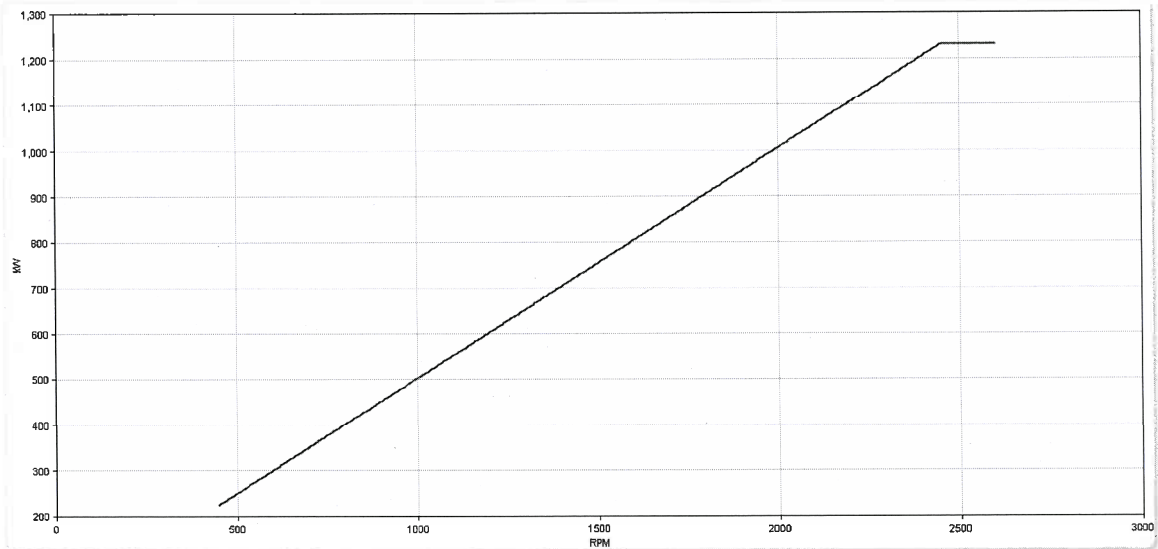
- Engine-matched torsional coupling .
- Mounting brackets .
- Propeller shaft flange and coupling bolt sets .
- SAE 1 or SAE 0 bell housings .
- Live PTO's: Pump shaft driven, input shaft driven, TOP PTO .
- Mechanical actuation with lever for attachment of push-pull cable .
- Monitoring kit .
- Trailing pump .
- Input flange for 'A' type - option .
- Classification by all major Classification Societies on request .
- Supershift (with Autotroll and Easidock) .

ZF 2050 A

Ratings

Pleasure Duty

RATIOS	MAX. TORQUE		POWER/RPM		MAXIMUM RATED POWER						MAX. RPM
	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
					2100 rpm		2300 rpm		2450 rpm		
■ 1.267*, 1.512*, 1.763, 2.029, 2.250*, 2.467	4802	3542	0.5028	0.6743	1056	1416	1157	1551	1232	1652	2600

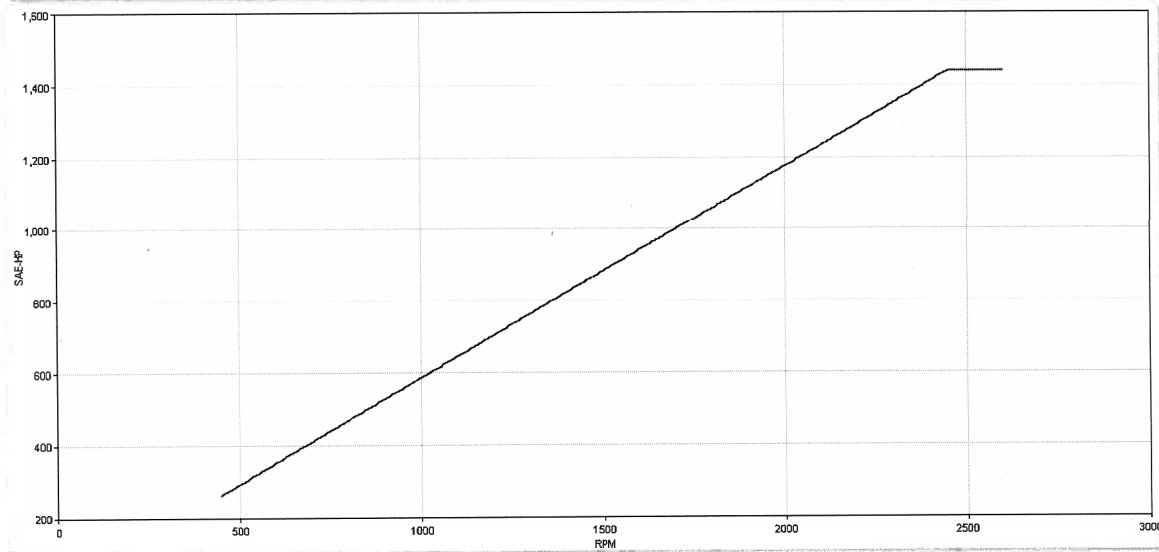
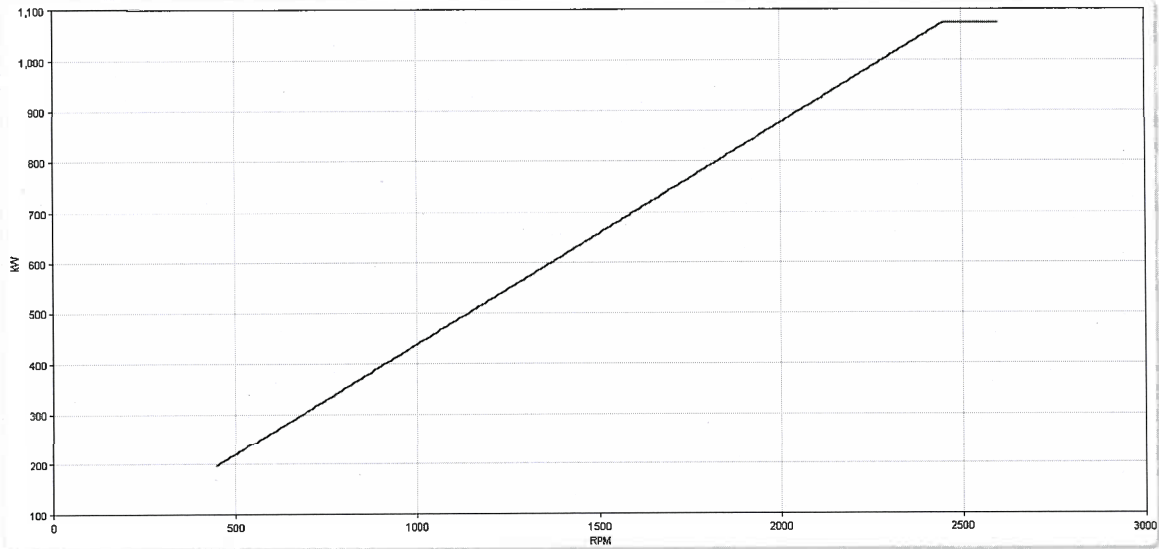


ZF 2050 A

Ratings

Light Duty

RATIOS	MAX. TORQUE		POWER/RPM		MAXIMUM RATED POWER						MAX. RPM
	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
					2100 rpm	2300 rpm	2450 rpm				
■ 1.267*, 1.512*, 1.763, 2.029, 2.250*, 2.467	4185	3087	0.4382	0.5877	920	1234	1008	1352	1074	1440	2600

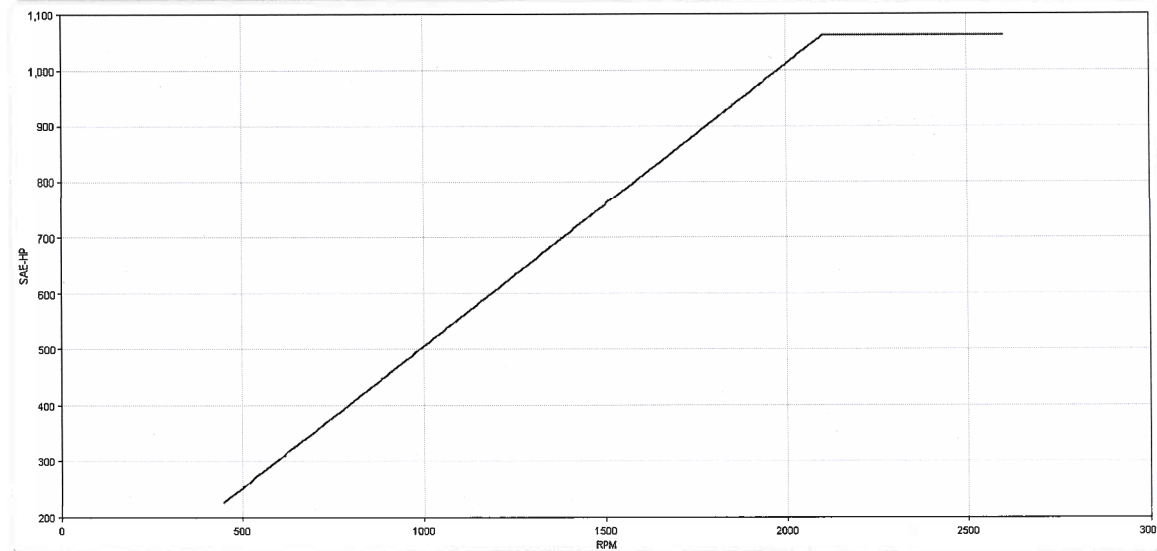
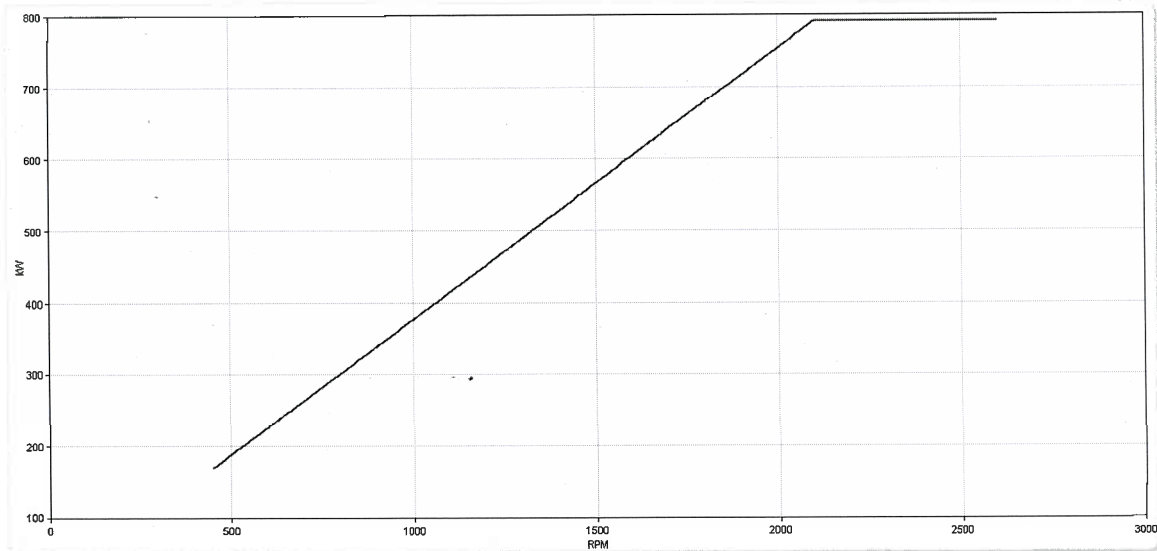


ZF 2050 A

Ratings

Medium Duty

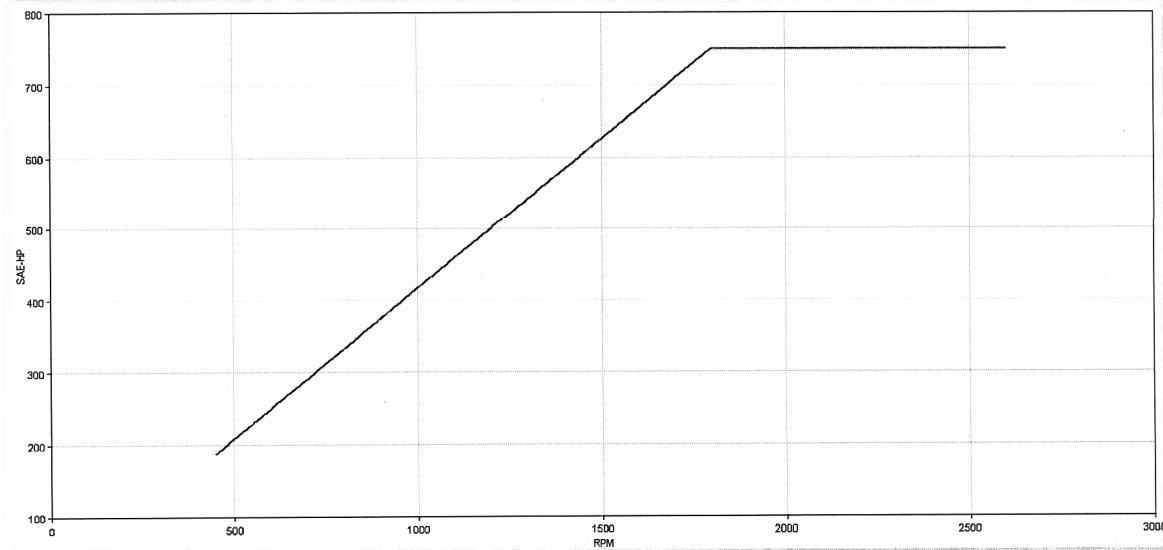
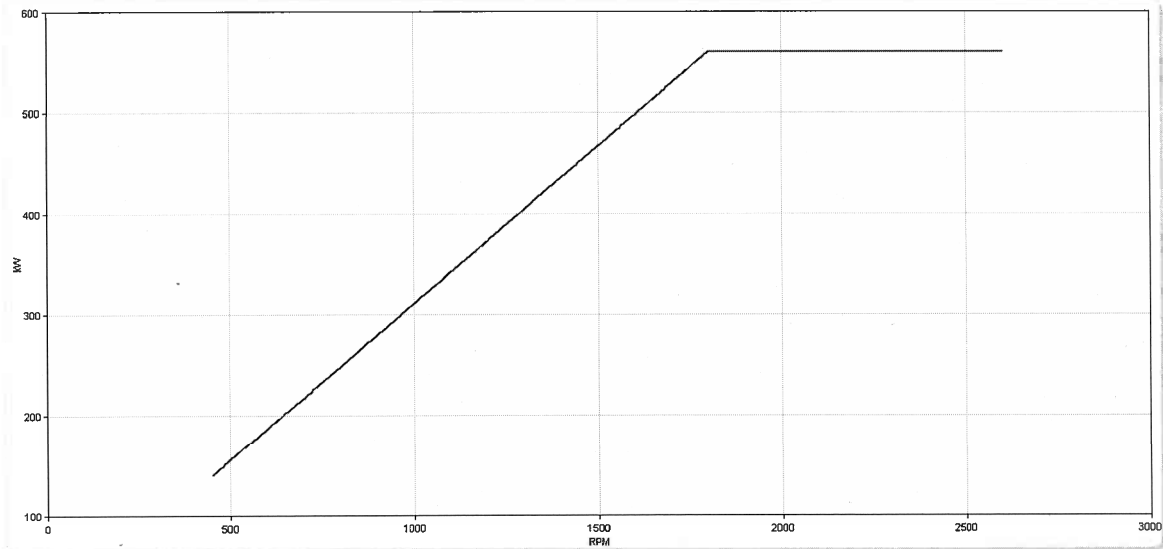
RATIOS	MAX. TORQUE		POWER/RPM		MAXIMUM RATED POWER						MAX. RPM
	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
					1800 rpm		1900 rpm		2100 rpm		
■ 1.267*, 1.512*, 1.763, 2.029, 2.250*, 2.467	3601	2656	0.3771	0.5057	679	910	716	961	792	1062	2600



ZF 2050 A Ratings

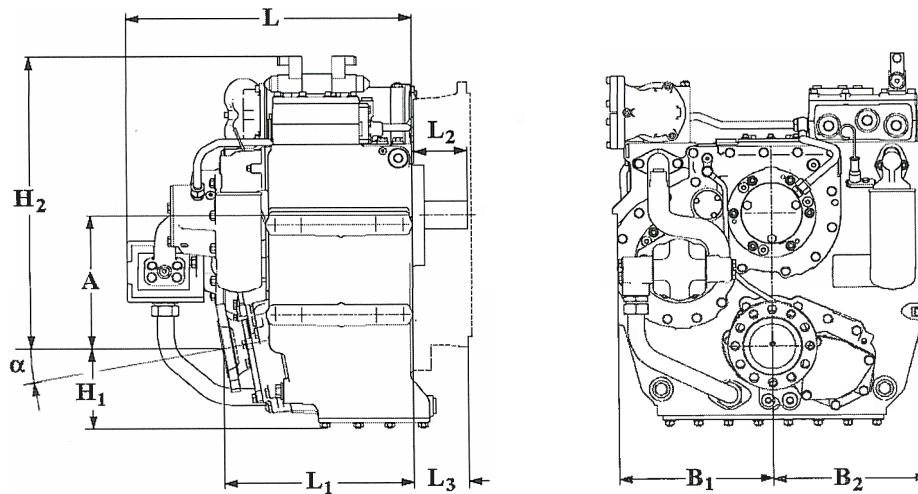
Continuous Duty

RATIOS	MAX. TORQUE		POWER/RPM		MAXIMUM RATED POWER						MAX. RPM
	Nm	ftlb	kW	hp	kW	hp	kW	hp	kW	hp	
					1200 rpm	1600 rpm	1800 rpm				
■ 1.267*, 1.512*, 1.763, 2.029, 2.250*, 2.467	2971	2191	0.3111	0.4172	373	501	498	668	560	751	2600



ZF 2050 A

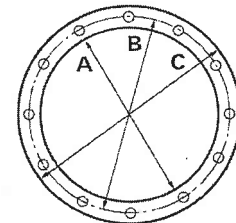
Dimensions



mm (inches)										
Angle	A	B ₁	B ₂	H ₁	H ₂	L	L ₁	L ₂	L ₃	Bell Hsg.
10.0	280 (11.0)	320 (12.6)	320 (12.6)	167 (6.57)	575 (22.6)	595 (23.4)	394 (15.5)	115 (4.53)	115 (4.53)	1
Weight kg (lb)						Oil Capacity Litre (US qt)				
350 (770)						21.0 (22.3)				

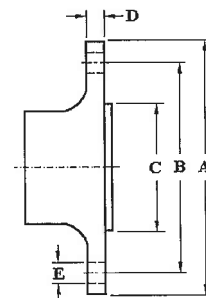
SAE Bell Housing Dimensions

SAE No.	A		B		C		Bolt Holes		
	mm	in	mm	in	mm	in	No.	Diameter	
0	647.7	25.5	679.45	26.75	711.2	28.0	16	13.49	17/32
1	511.18	20.125	530.23	20.875	552.45	21.75	12	11.91	15/32



Output Coupling Dimensions

A		B		C		D		Bolt Holes		
mm	in	mm	in	mm	in	mm	in	No.	Diameter (E)	
185	7.28	156	6.12	120	4.72	18.0	0.71	12	18.2	0.72



ZF 2050 A

Technical Notes

Duty Definitions

- PLEASURE DUTY DEFINITION** Highly intermittent operation with very large variations in engine speed and power
 Average engine operating 500 hours/year
 hours limit: 300 hours/year for mechanical gearboxes
 Typical hull forms: Planing.
 Typical applications: Private, non-commercial, non-charter sport/leisure activities.
- LIGHT DUTY DEFINITION** Intermittent operation with large variations in engine speed and power
 Average engine operating 2500 hours/year
 hours limit: (for hydraulic gearboxes smaller than the ZF 650 series, 2000 hours/year).
 Typical hull forms: Planing and semi-displacement.
 Typical applications: Private and charter, sport/leisure activities, naval and police activities.
- MEDIUM DUTY DEFINITION** Intermittent operation with some variations in engine speed and power
 Average engine operating 4000 hours/year.
 hours limit: 3500 hours/year for gearboxes smaller than ZF 2000 series and workboat ZF W2700 series.
 Typical hull forms: Semi-displacement and displacement
 Typical applications: Charter and commercial craft (example: crew boats and fast ferries), and naval and police activities.
- CONTINUOUS DUTY DEFINITION** Continuous operation with little or no variations in engine speed and power
 Average engine operating Unlimited
 hours limit:
 Typical hull forms: Displacement.
 Typical applications: Heavy duty commercial vessels, tugs, fishing boats.

Duty Ratings

Ratings apply to marine diesel engines at the indicated speeds. At other engine speeds, the respective power capacity (kW) of the transmission can be obtained by multiplying the Power/Speed ratio by the speed.

Approximate conversion factors:

1 kW = 1.36 metric hp

1 kW = 1.34 U.S. hp (SAE)

1 U.S. hp = 1.014 metric hp

1 Nm = 0.74 lb.ft.

Ratings apply to right hand turning engines, i.e. engines having counterclockwise rotating flywheels when viewing the flywheel end of the engine. These ratings allow full power through forward and reverse gear trains, unless otherwise stated.

Contact your nearest ZF Sales and Service office for ratings applicable to gas turbines, gasoline (petrol) engines, as well as left hand turning engines, and marine transmissions for large horsepower capacity engines.

Ratings apply to marine transmissions currently in production or in development and are subject to change without prior notice.

NOTE: THE MAXIMUM RATED INPUT POWER MUST NOT BE EXCEEDED (SEE RESPECTIVE RATINGS IN THE TECHNICAL DATA SHEETS)

Safe Operating Notice

The safe operation of ZF products depends upon adherence to technical data presented in our brochures. Safe operation also depends upon proper installation, operation and routine maintenance and inspection under prevailing conditions and recommendations set forth by ZF. Damage to transmission caused by repeated or continuous emergency manoeuvres or abnormal operation is not covered under warranty. It is the responsibility of users and not ZF to provide and install guards and safety devices, which may be required by recognized safety standards of the respective country (e.g. for U.S.A. the Occupational Safety Act of 1970 and its subsequent provisions).

Monitoring Notice

The safe operation of ZF products depends upon adherence to ZF monitoring recommendations presented in our operating manuals, etc. It is the responsibility of users and not ZF to provide and install monitoring devices and safety interlock systems as may be deemed prudent by ZF. Consult ZF for details and recommendations.

Torsional Responsibility and Torsional Couplings

The responsibility for ensuring torsional compatibility rests with the assembler of the drive and driven equipment. ZF can accept no liability for gearbox noise caused by vibrations or for damage to the gearbox, the flexible coupling or to other parts of the drive unit caused by this kind of vibration. Contact ZF for further information and assistance. ZF recommends the use of a torsional limit stop for single engine powered boats, wherein loss of propulsion power can result in loss of control. It is the buyer's responsibility to specify this option, which can result in additional cost and a possible increase in installation length.

ZF can accept no liability for personal injury, loss of life, or damage or loss of property due to the failure of the buyer to specify a torsional limit stop. ZF selects torsional couplings on the basis of nominal input torque ratings and commonly accepted rated engine governed speeds. Consult ZF for details concerning speed limits of standard offering torsional couplings, which can be less than the transmission limit. Special torsional couplings may be required for Survey Society Ice Classification requirements.



The system's fine art equipment allows the different production sites to manufacture everything from the coupling between the complete electronic dashboard, including the OHC methanol 5 blade surface piecing properties.

- SDBS IS A COMPLETE PROPULSION PACKAGE THAT INCLUDES:

- Instrumented control panel
 - 10 in. tv and stereo equipment
 - Memory lock-up system
 - 200 mph. stall
 - 200 hp 4-cylinder
 - Indicators and sensors
- **Only 1 FRANCE HELICES can provide you a complete drive propulsion package with Auto-Trim feature**

- easy to use the boat in shallow water
- guaranteed performance

- The opportunity to carry out the maintenance by oneself without qualified engineering
- The small amount of spare parts to keep in the inventory
- A world wide assistance in 24 hours for spare parts and technicians



immense steering capacity at high speed. The ability to use the boat in shallow water.

from salt and water corrosion. All of the cables, sensors, hydraulic lines, and electric connectors are shrouded inside the engine room, away from the harsh marine environment. All of the burst aluminum and stainless steel molinets are carried and machined with MATO distillation.

and machined with NATO classification.

Years of training, development and rigorous testing have resulted in the development of SPS, the most reliable surface drive transmission package.

Each piece used in its construction has high safety factor.

Each piece used in its construction has high safety factor ratio.

- Target speed
- Time life
- Safety calculation according to classification rules

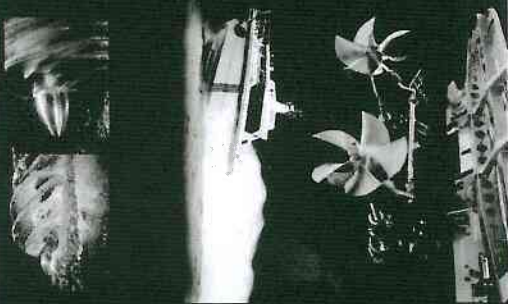
- Safety calculator according to certification rules.

- The constant effort in research and development by **FRANCE HELICES** has improved the efficiency of the surface properties up to 10% during the last decade
- The total overall propulsive coefficient can reach up to 70% when the operation is under the control of the **FRANCE HELICES** engineering team.
- The new series **FR55SP** shows an efficiency above 75% in cavitation limited mode.

The new 3000 FRTSSP show an efficiency above 75% in certified tunnel tests.

Typical K_t , K_d , E curves issued from cavitation tunnel for the #155SP series

WITH PERFORMANCE RELIABILITY FOR MAINTENANCE COST



ENGINE TORQUE CALCULATION

- **ENGINE:** 4.2l four-cylinder (3,500 rpm) $\text{E} = 174.0 \text{ hp}$ (127.5 kW) (Maximum Power)
- **DRIVE INPUT TORQUE:** The input is $T = 174.0 \text{ ft} \cdot \text{lb}$ (235.6 N·m) (Maximum Torque)
- **CHECK THE TABLE FOR THE SUITABLE MODEL.**

Age Group	Percentage
18-24	22%
25-34	15%
35-44	11%
45-54	7%
55-64	5%
65-74	3%
75-84	2%
85+	1%

THE HOLL
The hull form must be :
THE ENGINE (power source)
Many engines are available on the market

THE ROLL
The hull form must be:

- Warped type
- Diesel engines
- Gasoline engines

and power / weight ratio must be above 50 mW/g for light

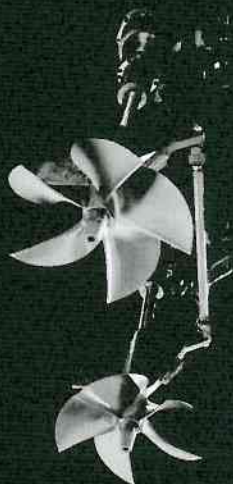
and power / weight ratio must be shown 50 percent per line.



[illegible]

	300 S	300 S-2	300 S-3	300 S-4	300 S-5	300 S-6	300 S-7	300 S-8	300 S-9	300 S-10	300 S-11	300 S-12	300 S-13	300 S-14	300 S-15	300 S-16	300 S-17	300 S-18	300 S-19	300 S-20	300 S-21	300 S-22	300 S-23	300 S-24	300 S-25	300 S-26	300 S-27	300 S-28	300 S-29	300 S-30	300 S-31	300 S-32	300 S-33	300 S-34	300 S-35	300 S-36	300 S-37	300 S-38	300 S-39	300 S-40	300 S-41	300 S-42	300 S-43	300 S-44	300 S-45	300 S-46	300 S-47	300 S-48	300 S-49	300 S-50	300 S-51	300 S-52	300 S-53	300 S-54	300 S-55	300 S-56	300 S-57	300 S-58	300 S-59	300 S-60	300 S-61	300 S-62	300 S-63	300 S-64	300 S-65	300 S-66	300 S-67	300 S-68	300 S-69	300 S-70	300 S-71	300 S-72	300 S-73	300 S-74	300 S-75	300 S-76	300 S-77	300 S-78	300 S-79	300 S-80	300 S-81	300 S-82	300 S-83	300 S-84	300 S-85	300 S-86	300 S-87	300 S-88	300 S-89	300 S-90	300 S-91	300 S-92	300 S-93	300 S-94	300 S-95	300 S-96	300 S-97	300 S-98	300 S-99	300 S-100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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INSTALLATION



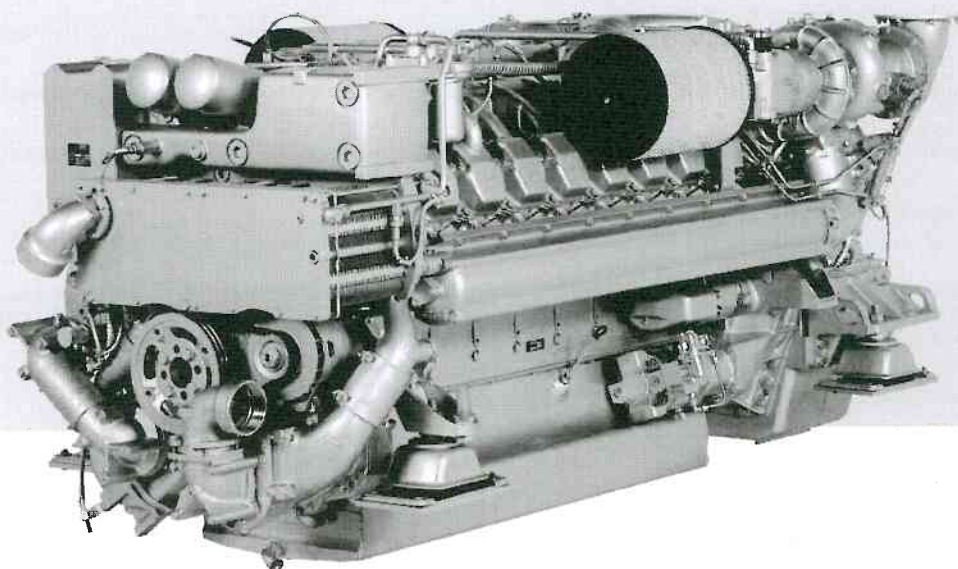
SURFACE DRIVE SYSTEM®

LEADER IN MACHINE PRODUCTION

Diesel Engines 12V/16V 2000 M90

for Fast Vessels

with Low Load Factors (1DS)



Typical applications:

Fast Yachts, Fast Patrol Boats,
Police Craft and Fire-Fighting
Vessels

Engine Model		12V 2000 M90	16V 2000 M90
Rated power ICFN	kW (bhp)	1007 (1350)	1343 (1800)
Speed	rpm	2300	2300
No. of cylinders		12	16
Bore/stroke	mm (in)	130/150 (5.1/5.9)	130/150 (5.1/5.9)
Displacement, total	l (cu in)	23.9 (1458)	31.8 (1943)
Flywheel housing		SAE 1	SAE 0
Gearbox model		ZF 2050 A i = 1.2 - 2.5	ZF 3055 i = 1.5 - 2.7

Performance and Fuel Consumption ¹⁾		12V 2000 M90			16V 2000 M90		
Speed	rpm	2300	1800	1200	2300	1800	1200
Maximum power	kW	1007	940	500	1343	1245	790
	bhp	1350	1267	671	1800	1670	1187
Power on propeller curve ²⁾	kW	1007	480	145	1343	625	190
	bhp	1350	664	194	1800	865	255
Fuel consumption on propeller curve ²⁾	g/kWh	218	207	220	217	207	213
	l/h	264.5	119.7	38.4	351.1	155.9	48.8
	gal/h	69.9	31.6	10.2	92.8	41.2	12.9

¹⁾ Tolerance +5% per ISO 3046, Diesel fuel to DIN EN 590 with a min L.H.V. of 42800kJ/kg (18390 BTU/lb) ²⁾ 3.0 exponent



Standard Equipment

Starting System	Electric starter motor 24 V
Auxiliary PTO	Charging generator, 140A, 28V, 2 pole
Oil System	Gear driven lube oil pump, lube-oil duplex filter with diverter valve, lube-oil heat exchanger, handpump for oil extraction
Fuel System	Fuel feed pump, fuel hand pump, fuel pre-filter, fuel main filter with diverter valve, on-engine fuel oil cooler, individual HP injection pumps, jacketed HP fuel lines, injection nozzles (PLN system), flame proof hose lines, leak-off fuel tank level monitored
Cooling System	Coolant-to-raw water plate core heat exchanger, self priming centrifugal raw water pump, gear driven coolant circulation pump
Combustion Air System	Sequential turbocharging with 2 water-cooled exhaust-gas turbochargers, on-engine set of combustion-air filters
Exhaust System	Triple-walled, liquid-cooled, on-engine exhaust manifolds, 2 exhaust bellows vertical discharge
Mounting System	Resilient mounts at free end
Engine Management System	Engine and gearbox control and monitoring system (MDEC)

Optional Equipment

Auxiliary PTO	Bilgepump, on-engine PTOs
Oil System	Centrifugal oil filter, oil replenishment system
Fuel System	Duplex fuel pre-filter
Cooling System	Coolant preheating system, integr. seawater gearbox piping
Exhaust System	2 exhaust bellows horizontal discharge
Mounting System	Resilient mounts at driving end
Engine Management System	In compliance with Classification Society Regulations (EMU + GMU)
Monitoring / Control System	blueLine , MCS-5, RCS-5
Power Transmission	Torsionally resilient coupling
Gearbox Options	Reverse reduction gearbox, el. actuated, gearbox mounts, trolling mode for dead-slow propulsion, free auxiliary PTO, hydraulic pump drives
Classification	ABS, BV, CCS, DNV, GL, KR, JG, LR, NK, RINA

Power definition according ISO 3046

Intake air temperature 25°C / Sea water temperature 25°C

Intake air depression 15 mbar / Exhaust back pressure 30 mbar

Barometric pressure 1000 mbar

Power reduction at 45°C/32°C: none

All engines fulfil IMO emission regulation, certificate on request

Dimensions and Masses (incl. gearbox)

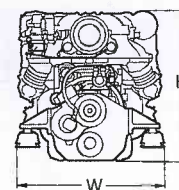
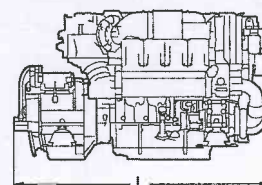
Engine Model		12V 2000 M90	16V 2000 M90
Length [L]	mm (in)	2600 (102.4)	3075 (121.1)
Width [W]	mm (in)	1890 (74.4)	1400 (55.1)
Height [H]	mm (in)	1290 (50.8)	1290 (50.8)
Mass [dry]	kg (lbs)	3480 (7672)	4300 (9480)

Specifications are subject to change without notice.

All dimensions are approximate. For complete information refer to installation drawing.

For further information consult your MTU or MTU Detroit Diesel distributor/dealer.

Dimensions and Masses



12V 2000

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 **HamiltonJet**

HM SERIES
750kW to 3500kW

HamiltonJet HM series waterjets provide highly efficient propulsion for high speed vessels operating in the world's most demanding marine environments.

Combining quality materials and manufacturing with superior research, design and product support ensures HamiltonJet HM waterjets out-perform other models in their class.



HamiltonJet

The HamiltonJet Promise

Total Waterjet Solutions

With experience spanning six decades, HamiltonJet provides a totally integrated waterjet propulsion solution to the marine industry. From initial enquiry and right through the lifespan of a vessel, HamiltonJet offers a comprehensive customer support package that is second to none.

HamiltonJet has been providing waterjet propulsion solutions to the marine industry since the 1950s, and has installed more than 50,000 waterjets into vessels around the world. Through this experience HamiltonJet understands the wide range of conditions, situations and tasks a modern vessel needs to be able to undertake on a daily basis throughout its operating life.

The company also has more experience with designers and boat builders than any other waterjet manufacturer, and so provides the simplest installation package of any waterjet design in the market today.

Knowledge gained through unrivalled waterjet application experience means HamiltonJet is able to provide accurate performance predictions to ensure a vessel will deliver on its design criteria. This knowledge and experience is shared globally through HamiltonJet's extensive distributor sales and support network.

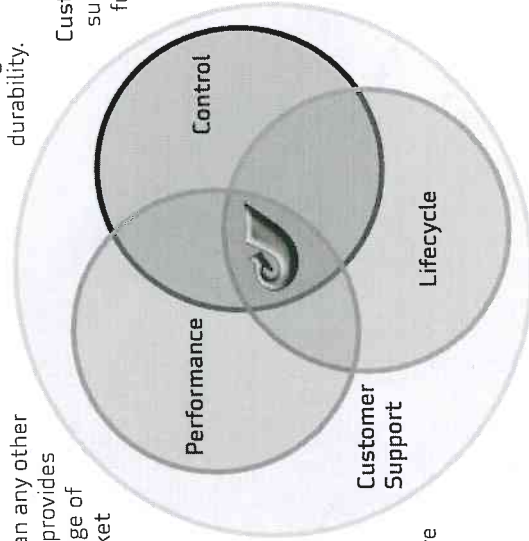
Evidence of HamiltonJet's success can be seen in the range of innovative designs the company has pioneered, each raising the standard of waterjet performance, control and lifecycle, all of which build on the HamiltonJet ethos of superior customer support.

Performance = high and low speed power and efficiency, load carrying capability and acceleration.

Control = high and low speed manoeuvrability, course keeping, close quarters manoeuvring and development of innovative control system technology.

Lifecycle = Pre-sales application engineering, simple installation, integrated features and maximum durability.

Customer Support = spare parts supply & advice in country, full spares warehouse & HamiltonJet technical staff in region, installation and commissioning service assistance, and training programmes.



Right: *WindCat 21*, a windfarm service boat operating off the UK coast, utilises twin HamiltonJet HM571 waterjets.



The Waterjet Advantage

EFFICIENCY

As vessel speed increases waterjets become more efficient compared to conventional propeller systems. Efficiency benefits are due to...

- No appendage drag - the waterjet intake sits flush with the hull bottom without struts, propeller shafts, rudders or any elements protruding beneath the hull to increase hull resistance, particularly as speed increases.
- Thrust generated by a waterjet is parallel to the direction of travel. For many propeller systems the shaft is angled down and thrust is generated in the direction of the shaft, so only a component of the total thrust is in the direction of travel.
- Energy lost from flow rotation is recovered by the stator section of the waterjet. This is energy that is lost in a propeller installation.

MANOEUVRABILITY

Waterjet propulsion provides far superior manoeuvrability at both high and low speeds compared to a propeller boat...

- Waterjet thrust is independent of boat speed - thrust is determined by input power and astern deflector position and is available at all times, even at zero speed. Result - boat can be turned without moving ahead or astern, and the ability to move the reverse deflector slightly either side of the zero speed position also provides very fine ahead or astern control, all while maintaining full steering control.
- No need to change engine rotation to generate reverse thrust. A change from full forward thrust to full reverse thrust only requires the reverse duct to move from fully up to fully down position.
- Sideways thrust capability with two or more jets (with split duct reverse deflectors) without the need for a bow thruster.



SAFETY

Waterjets have no exposed high-speed moving components external to a vessel's hull, providing greater safety to people in the water and marine life, and allowing the propulsor to keep running when operating in such conditions. There is also less risk to equipment in the water.

A waterjet is inherently more durable than conventional propeller propulsion...

- No exposed appendages beneath the hull - allows the vessel to access shallow waterways, cross sandbars and reefs, and complete beach landings and launches.
- The impeller is protected inside the body of the jet - propulsion gear is not exposed to damage from floating debris or in the event of grounding.
- Maintenance can be predicted and planned in advance - with propeller systems there is always uncertainty as exposed propulsion gear could be damaged at any time. Waterjets reduce downtime for vessel maintenance and can mean fewer vessels are required in a fleet.



DURABILITY

Waterjets offer significant advantages for vessels subject to variable loads...

- Boat speed is determined by hull weight - when the vessel is running light it will travel faster or maintain service speed with reduced power input, resulting in fuel and time savings.
- Engines can not be overloaded when vessel is heavily laden - unlike propeller systems which can transfer load to the engine, a waterjet will always match available engine power. This results in less engine wear and consequently less maintenance and longer engine life.
- Secondary propulsion option - waterjets can be used as boost or toiler propulsion alongside other waterjets or propellers.

FLEXIBILITY

Right: Passenger Ferry Key West Express in Florida, USA, has four HamiltonJet HM811 waterjets delivering over 300,000 N of thrust.

The HamiltonJet Difference

PERFORMANCE

High speed performance and efficiency – advanced impeller and intake designs provide peak efficiency and performance over a wide speed range.

Low speed performance – high thrust at low speeds ensures excellent station-keeping, bollard pull, load carrying and manoeuvring.

Acceleration – ability to apply full power at lower speeds ensures fast acceleration for patrol boats, rescue craft, pilot boats and recreational vessels.

CONTROL

Steering control – HamiltonJet's JT steering system out-performs all others, reducing thrust losses when steering to give tighter turns and maintain vessel speed during the turn.

Ahead / Astern control – HamiltonJet's split duct reverse deflector provides up to 60% of forward thrust, resulting in highly responsive control at slow boat speeds where engine is set to higher than idle RPM and the reverse duct is used to regulate forward and aft thrust.

Speed of the controls response – HamiltonJet controls respond quickly to skipper input to improve manoeuvring control and safety. The company develops hydraulic and electronic control systems to maximise the control benefits of its waterjets.

LIFECYCLE

Material specifications – all HamiltonJet waterjets are manufactured using high quality materials to ensure the best mix of durability, weight, corrosion resistance and cost.

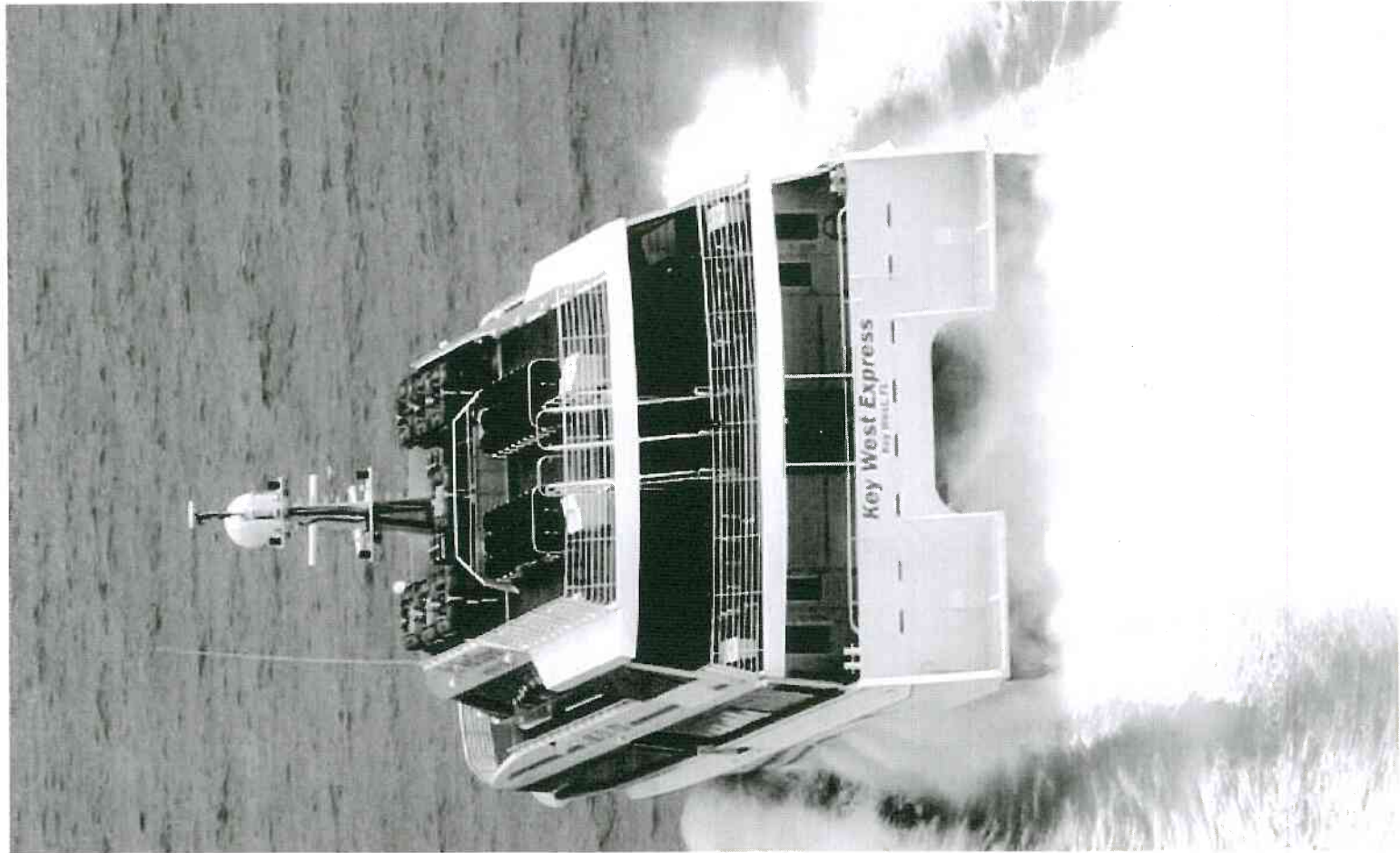
Impeller rating accuracy – impellers are cast as a single piece to ensure more accurate ratings for all impellers and a better match to peak engine rating.

Application engineering – HamiltonJet provides the highest level of technical expertise and advice to builders, designers and end users throughout the entire vessel design, build and commissioning phases, and for the operational life of a vessel.

Integrated Engineering – Each HamiltonJet waterjet is a complete packaged, factory tested, propulsion module, with reverse and steering control systems fully integrated with the jet to simplify installation and maintenance.

SUPPORT

International Support – HamiltonJet's service and support network extends around the globe to provide immediate assistance and spare parts supply.



HamiltonJet Features

Material Specifications

Component	Material	Standard
Transition Duct	To match hull material	
Impeller	CF8M Stainless Steel	ASTM A743
Wear Ring	2205 Stainless Steel	ASTM A240
Mainshaft	2205 Stainless Steel	ASTM A276
Stator	EN AC 44100 Marine Grade Aluminium	B5 EN 1706
Nozzle	EN AC 44100 Marine Grade Aluminium	B5 EN 1706
Steering Deflector	EN AC 44100 Marine Grade Aluminium	B5 EN 1706
Astern Deflector	EN AC 44100 Marine Grade Aluminium	B5 EN 1706
Thrust Bearing	Spherical roller type	
Rear Bearing	Water lubricated Marine Bearing	
Shaft Seal	Face type mechanical seal	
Anodes	Aluminium	MIL-A-24779(SH)

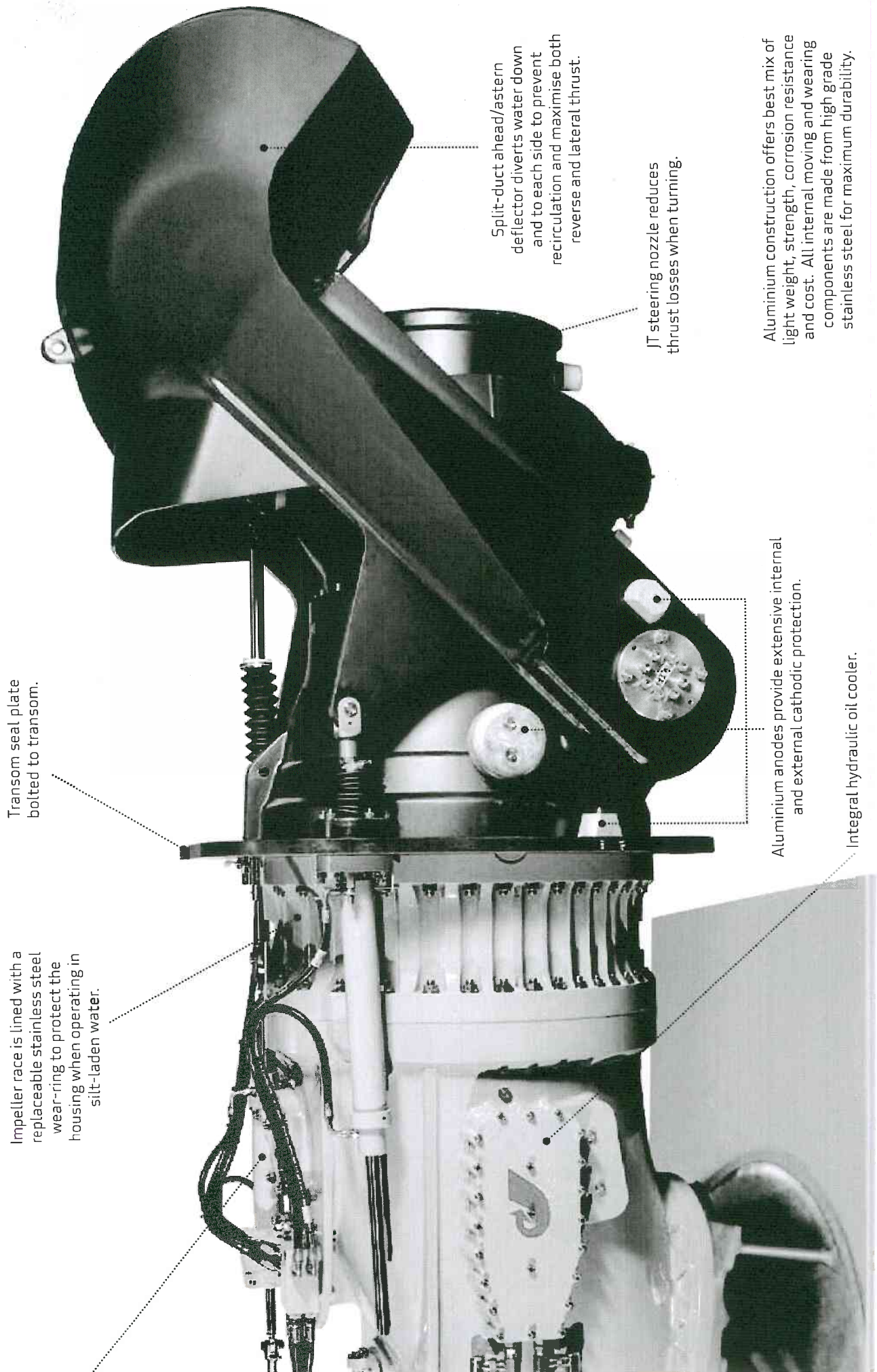
All hydraulic components are mounted inboard where they are protected from corrosion and marine growth. The integral JHPU hydraulic pump and circuits are set up and tested in the factory prior to dispatch. No need for additional pumps and plumbing to be fitted.

Inboard thrust bearing assembly transfers thrust forces to intake block and hull bottom, not transom, so no additional hull or transom reinforcing is required.

Driveshaft coupling flange with options to match a wide range of driveshafts - normally driven via a gearbox. No difficult engine alignment problems.

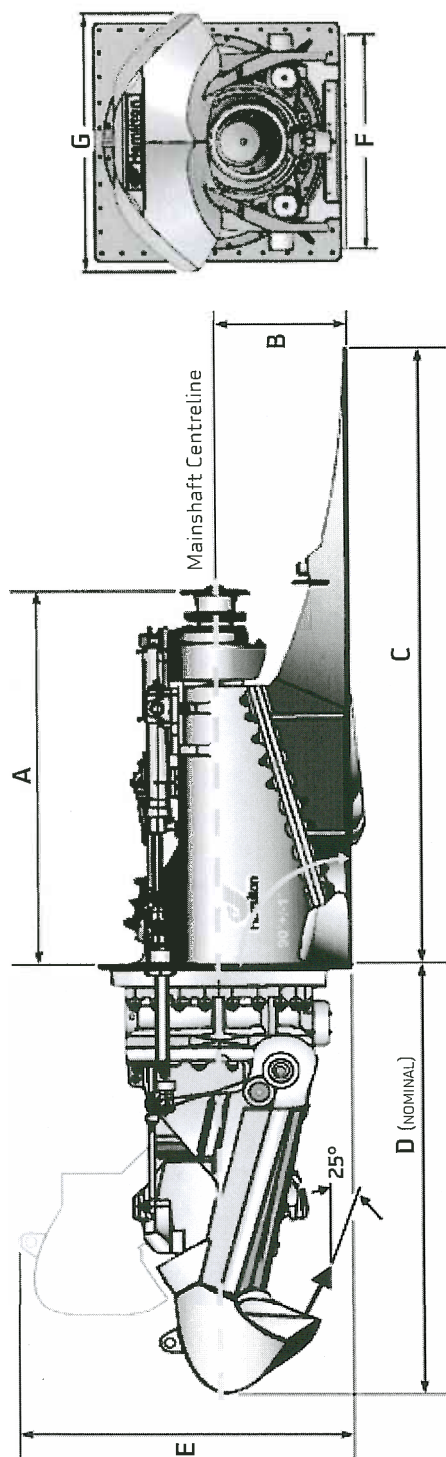
Transition duct, including protective screen bars, is supplied ready to mount in hull - welded in aluminium or steel hulls, moulded into GRP hulls. This hydrodynamically designed transition duct ensures optimal flow of water to the impeller while the screen protects the pump from damage due to ingested material, without adversely affecting waterflow into the jet unit.





HM Series Dimensions

The HM series comprises a range of highly efficient waterjet units suitable for propelling craft at speeds ranging from zero to up to 50 knots and typically of length between 20 and 60 metres.



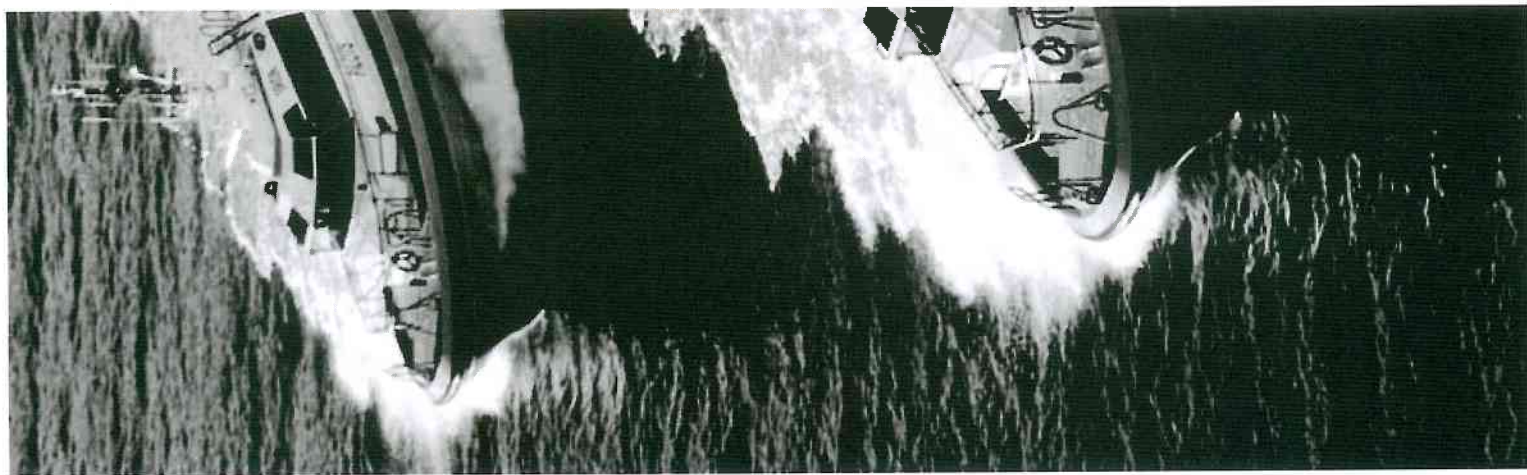
Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)
HM422	1380	484	2082	1090	940	960	964
HM461	1280	420	2048	1440	1016	900	1040
HM521	1424	475	2350	1630	1200	1000	1200
HM571	1561	530	2585	1800	1300	1000	1285
HM651	2105	593	3360	1650	1470	1100	1500
HM721	2381	667	3779	1860	1612	1250	1660
HM811	2672	750	4252	2100	1800	1400	2000

IMPORTANT NOTE: Dimensions shown above are indicative only for initial design purposes. All specifications are subject to change without notice or obligation. For detailed installation data and instructions consult HamiltonJet.

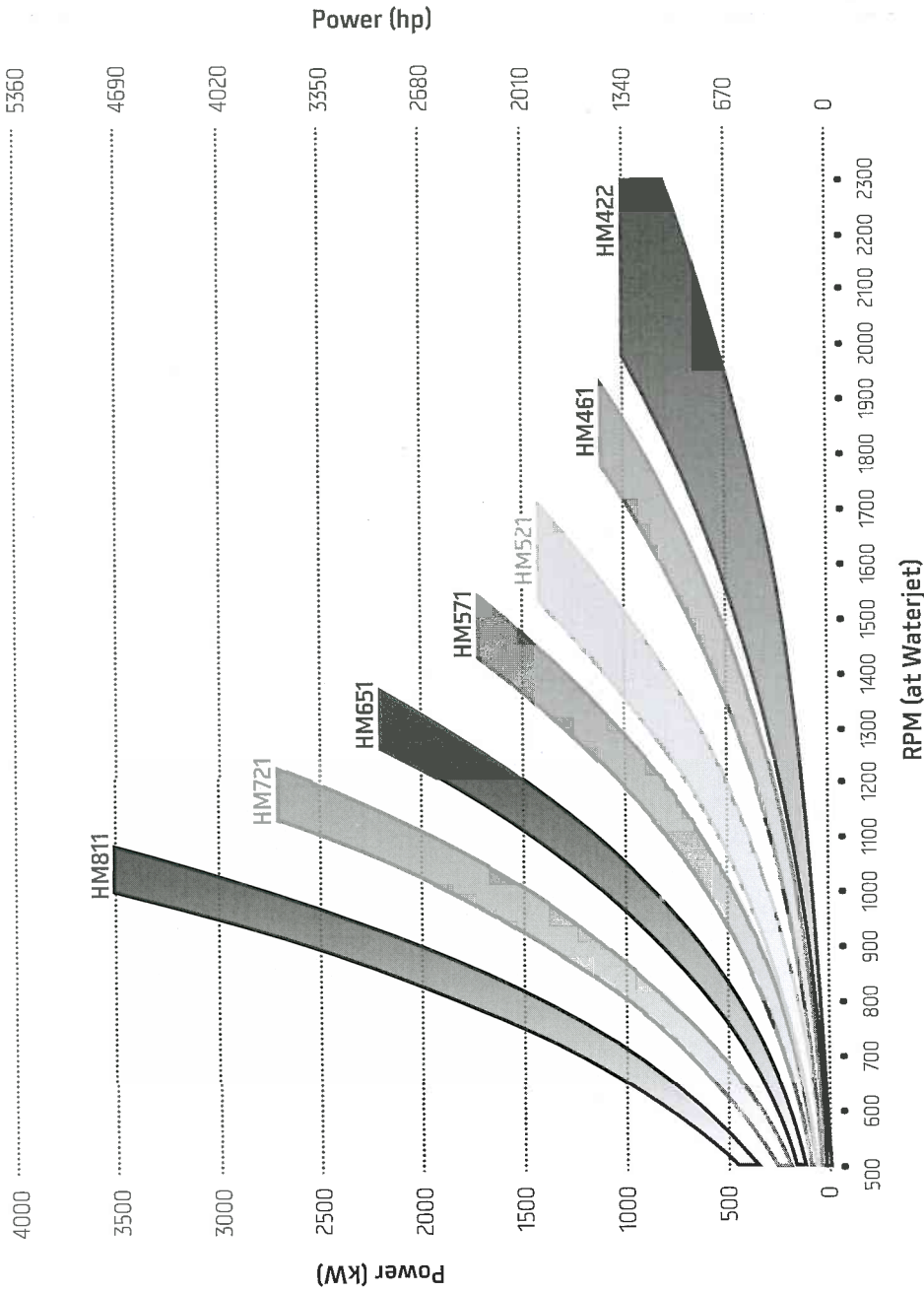
HM Series Total Package

HM series waterjets are supplied as a completely packaged propulsion module - a design philosophy that simplifies installation procedures for the boat builder. The jet is installed as an assembly, being manoeuvred forward through the transom hole and bolted to the HamiltonJet supplied matching intake/transition duct, which has been welded or moulded into the hull. The builder is not required to fabricate any complex intake ducts. It is then only a matter of installing the driveline and completing the control system interface.

No additional strengthening of the hull or transom is required as HM series waterjets are of robust cast construction capable of transmitting the full force of generated thrust to the hull bottom via the intake/transition. The jet's main thrust bearing is incorporated in the cast body and is unaffected by hull movement. Jets and matching control systems can be configured for up to quadruple main propulsion installations, or can be employed with other propulsors for loiter and boost applications.



HM Series Power / RPM Curves

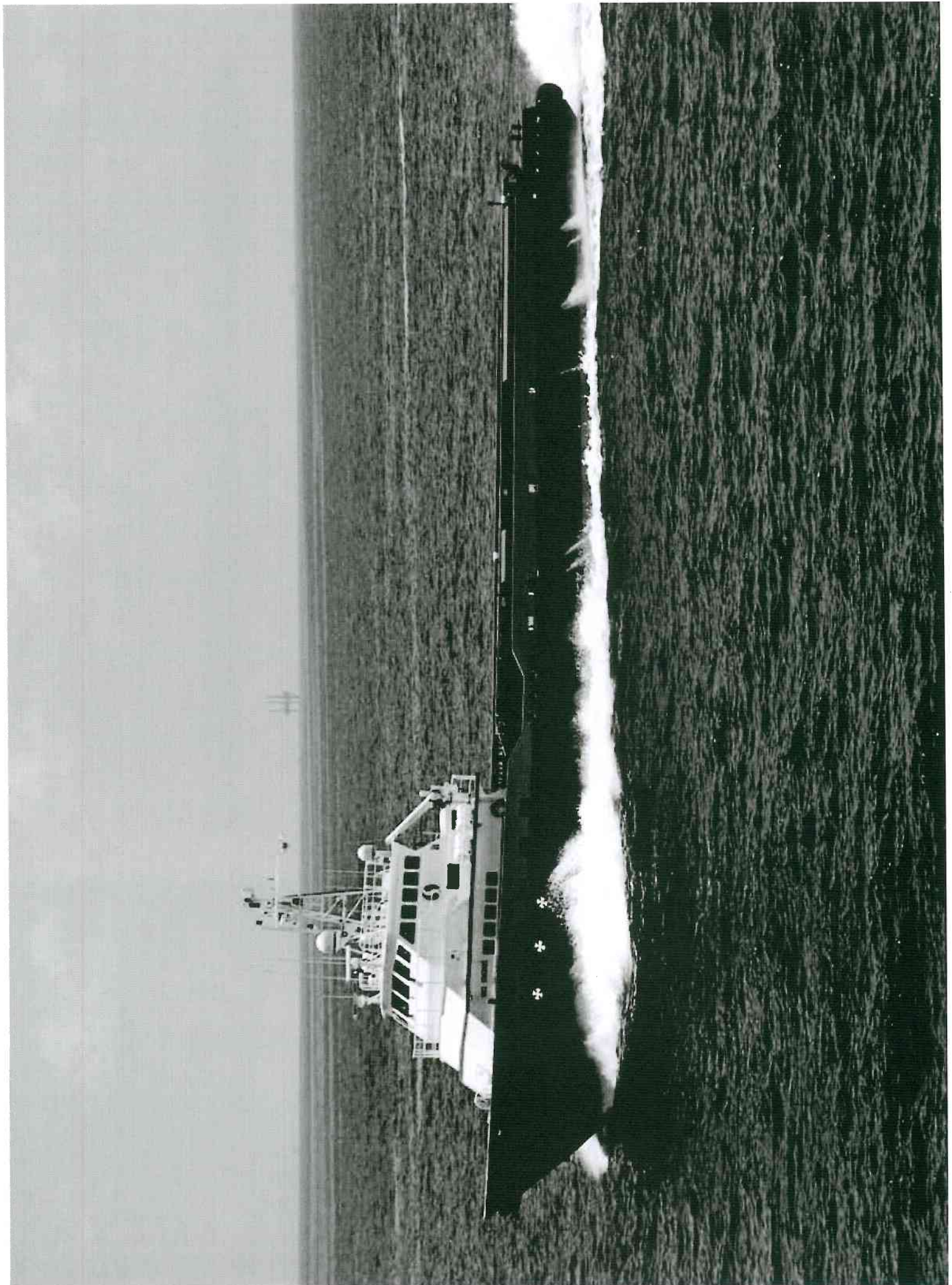


Jet Model	HM422	HM461	HM521	HM571	HM651	HM721	HM811
Max Sprint Power (skW)	1000	1100	1400	1700	2200	2700	3500
Input rpm range	2030-2300	1795-1900	1587-1710	1448-1569	1305-1407	1149-1236	1030-1104
Max Continuous Power (skW)	750	900	1150	1380	1750	2200	2800
Input rpm range	2000-2300	1680-1800	1508-1624	1357-1470	1220-1316	1073-1154	955-1025

NOTE: Input rpm are subject to suitable cavitation limits. The lower rpm figure is always preferred. Higher power inputs will restrict the input rpm range.

Left: New pilot boats in The Netherlands each use twin HamiltonJet HM651 waterjets.





HM Series Control Systems

JT Steering

All HM series waterjets incorporate HamiltonJet's JT steering nozzle to optimise both steering efficiency and delivery of propulsive thrust. Compared with other waterjet steering systems, the JT nozzle provides outstanding steering response at all boat speeds. This is particularly noticeable at low speeds due to the absence of a central "deadband". The design reduces nozzle flow disturbance, resulting in lower energy losses and minimal loss of forward thrust when steering. These factors mean higher overall efficiency through improved course-keeping and, coupled with low steering loads and noise level, make the JT system highly effective and reliable under all conditions.

Ahead / Astern

The ahead/astern function is an integral part of HM series waterjets, utilising a split-duct deflector to provide maximum astern thrust under all conditions. The splitter incorporated in the deflector divides the flow to two outlet ducts angled down to clear the transom and to the sides to retain steering thrust. Vectoring the astern thrust away from the jet intake avoids recirculation and the resulting astern thrust is equivalent to up to 60% of ahead thrust - maintainable up to high throttle settings.

The shift from full ahead to full astern is a smooth transition as the deflector is lowered through the jetstream, eliminating any delay or shock loading normally associated with propeller/gearbox drives. Designed to withstand the loads imposed when the deflector is lowered at full speed ahead, the arrangement provides a powerful braking function for emergencies.

The separation of steering and ahead/astern functions offer the opportunity for unlimited combinations of translational and rotational movements for outstanding control of multiple-jet propelled vessels.

Control Functions

Since steering and ahead/astern functions are separate and have independent effects, they may be used together to enable complex vessel manoeuvres without complex combinations of control inputs by the operator.

With the astern deflector fully raised, full forward thrust is available. With the deflector in the lower position, full astern thrust is generated. In both positions full independent steering is available for rotating the craft. By setting the deflector in the intermediate "zero-speed" position, ahead and astern thrusts are equalised for holding the craft on station, but with independent steering effect still available for rotational control. Infinitely variable adjustment either side of "zero-speed" enables the craft to be crept ahead or astern, and in multiple jet installations appropriate thrust vectoring alone can be used to induce true sideways movement.

Control Systems

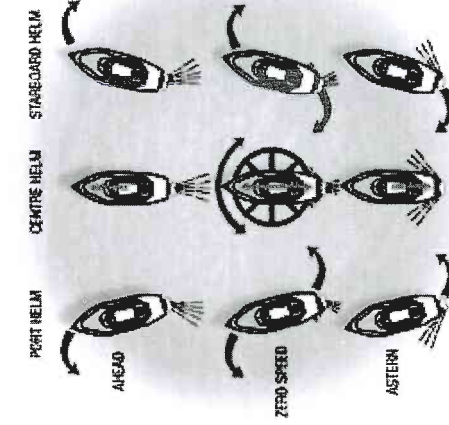
HFRC Follow-up Reverse Control (HM422 to HM571 only)

Provides unsynchronised "follow-up" positional control of the astern deflector. This means the control lever can be moved quickly without restriction and the deflector will follow at its own speed to find the required position. The operator can pre-set astern lever position prior to engine start, then at start up the deflector will immediately move to the correct position. What's more, unlike synchronised controls, the system cannot be strained or forced by the operator. Steering control is achieved through the use of a Seastar power-assisted steering system (application limitations may apply - consult HamiltonJet for more information).

MECS Electronic Control

The HamiltonJet Modular Electronic Control System (MECS) is a software configurable control system for waterjet steering and reverse, engine throttle and gearbox control. It comprises a number of standard modules that may be connected together in varying combinations to build a control system customised to that particular vessel and its operational requirements. In addition to the electronic modules, a complete system includes a jet mounted and driven Hydraulic Power Unit (HPU) on each jet, inboard hydraulic steering and reverse actuators, including feedback units, engine and gearbox interfaces (or actuators). The system is also capable of interfacing with other proprietary Autopilot and vessel management systems such as Dynamic Positioning and Voyage Data Recorders.

Left: Michael G. McCall crewboat with quadruple fully controllable HamiltonJet HM811 waterjets and a central HM811 boost jet.



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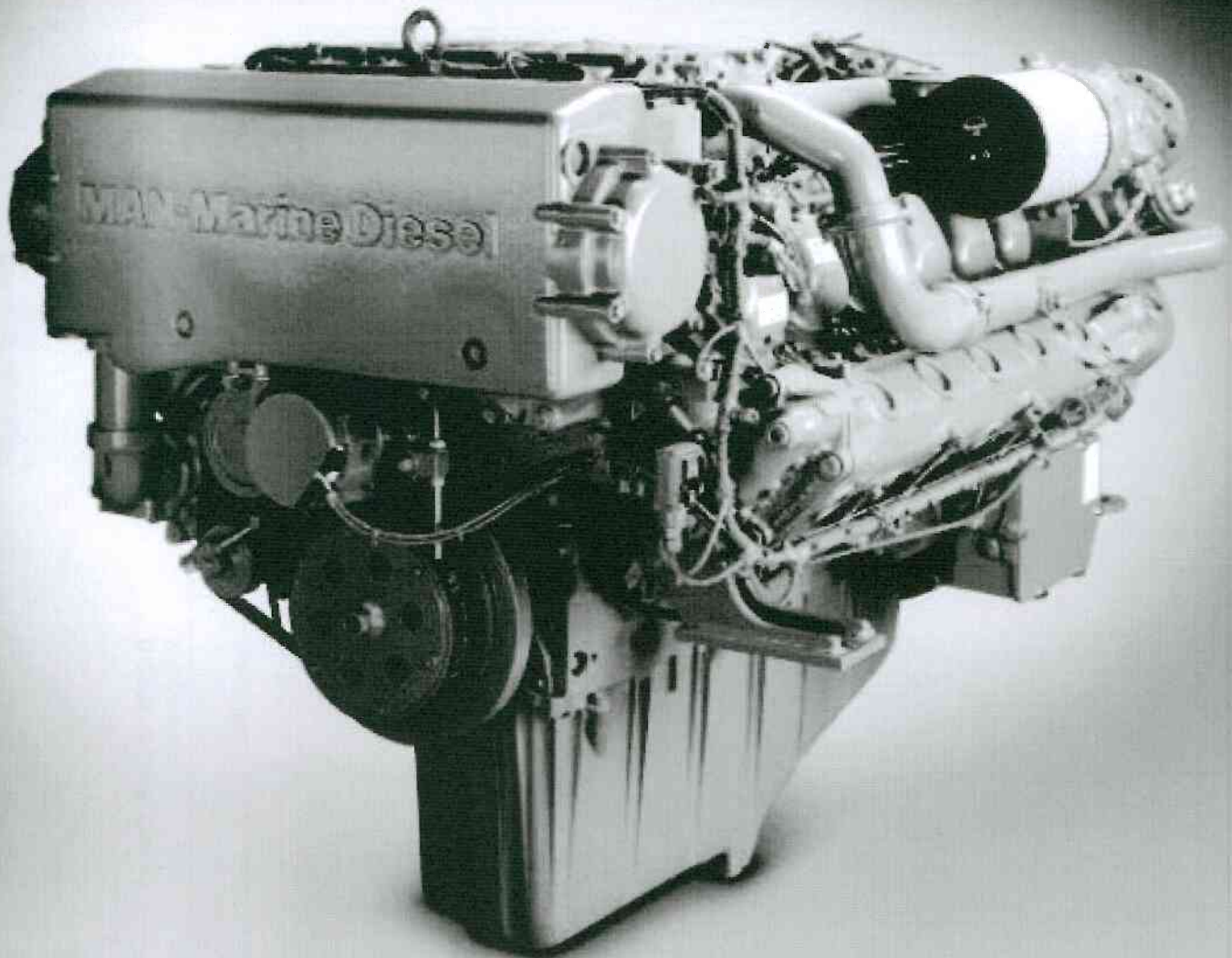
Email: hamiltonjet.asia@hamjet.co.nz

Cover: Police Patrol vessel with triple HamiltonJet HW723 waterjets



HamiltonJet

Your local HamiltonJet Distributor is...



MAN marine diesel engines

Medium-duty operation

265 – 809 kW (360 – 1100 hp)





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Postfach 44 02 58
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e-mail: marinemotor@de.man-mn.com
www.man-mn.com/engines

A member of the MAN Group

Definition medium duty operation

- Annual operating hours ≤ 2000
- Percentage of time at full load ≤ 50%
- Average load application ≤ 70%
- Particular operating conditions No wide-open throttle below rated speed

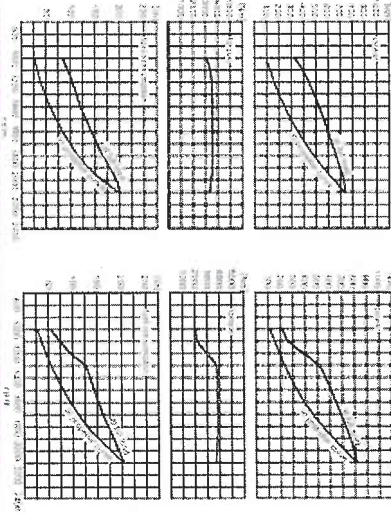
Typical applications:

- Escort boats
- Pilot boats
- Fishing boats
- Passenger boats
- Ferries
- Cruising vessels
- Bagging trol boats

If you have questions concerning the load profile or application please contact our sales department.

Rating:

The ratings are to DIN ISO 3046/1 at 208 K (25° C) ambient temperature, 100 kPa (1000 mbar) barometric pressure and 50% relative humidity.



D 2842 LE113 735 kW / 1000 hp

D 2842 LE110 659 kW / 900 hp

Quality characteristics of MAN engines

- High tractive power even at low speeds
- Powerful acceleration and rapid reaction to commands
- High performance combined with low weight
- Compact, space-saving design
- Large operating range owing to low consumption
- Low running costs
- Low service life
- Low emission values

The engines satisfy the IMO regulation on exhaust-gas emissions and various national regulations.

Technical description

Engine characteristic

Water-cooled 4-stroke diesel engine with 6 cylinders in-line and 8, 10 or 12 cylinders in 90° V design respectively, direct fuel injection, exhaust turbocharger, intercooler, boost pressure control partly with waste gate

Components

Cylinder heads valve gear

Fuel system

Engine block

Engine lubrication

Type of coupling

Electronics

Exhaust gas status

Quality certificates

Ambient conditions

Fuels

Special equipment

Single ID 281 out double ID 281 cylinder heads with 2 or 4 valves per cylinder

Replaceable valve seat inserts and valve guides

Bosch injection pump, mechanical or electronic injection control (EDC)

High strength casting with integrated oil and water ducts and with replaceable cylinder liners

Closed system with forced feeding, oil cooling and filtering

Heat exchanger with engine and seawater circuit

For engine control, piezo pie fuel system

Depending on engine model electronic engine monitoring in some cases including diagnostic unit

System voltage 24 V, alternator 55 Amp, 120 Amp optional for V engines

MAN MARECO 73/75

On request: ZKR, SAV (Switzerland) and DSO for commercial applications

ISO 9001 certified by TÜV

To ISO 3046, EN 590

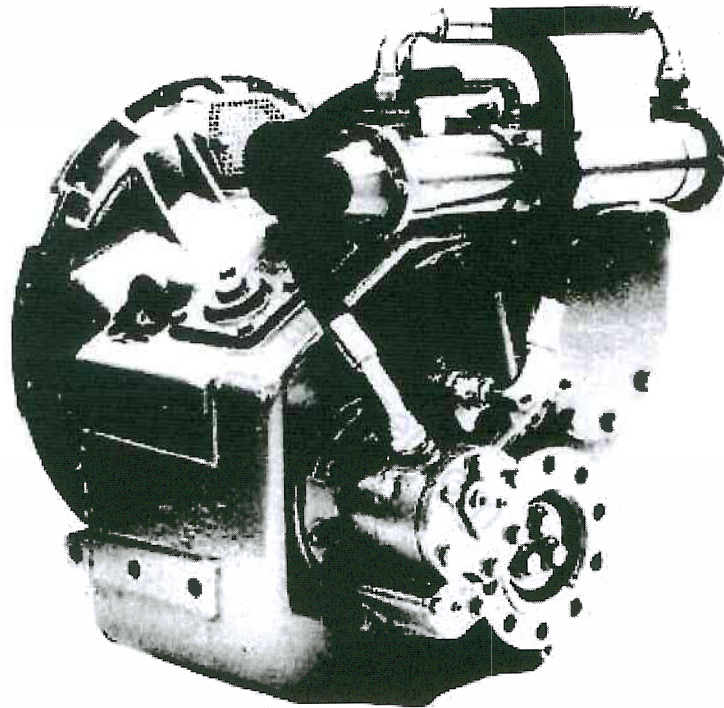
DIN 101 to ISO 8217

On request:



MARINE TRANSMISSION SYSTEMS

IRM 350 PL



DESCRIPTION

- Reverse reduction marine transmission with hydraulically actuated multi-disc clutches
- Suitable for high performance applications in luxury motoryachts, sport fishers, express cruisers etc.
- Robust design also withstands continuous duty in workboat applications
- Fully works tested, reliable and simple to install
- Compatible with all types of engines and propulsion systems, including waterjets and surface-piercing propellers
- Design, manufacture and quality control standards comply with ISO 9001

MAIN FEATURES

- Lightweight and robust aluminum alloy casing (sea water resistant)
- Case hardened and precisely ground gear teeth for long life and smooth running
- Output shaft thrust bearing designed to take maximum propeller thrust astern and ahead
- Compact, space saving design due to 7° down-angle and integral SAE 1 bell housing
- Smooth and reliable hydraulic shifting with control lever for attachment of push-pull cable
- Suitable for twin engine installations (same ratio and torque capacity in ahead or astern mode)
- Emergency "get home" capability
- Replaceable oil filter cartridge

OPTIONAL EXTRAS

- Oil cooler complete with fittings and flexible oil pipework
- Engine-matched torsional coupling
- Mounting brackets for rigid connection to foundation or anti-vibration mountings
- Trolling valve for slow-speed drive
- Propeller shaft flange and coupling bolt sets
- Classification by all major Classification Societies on request
- Monitoring kit
- PTO (live or clutchable) - retrofitable

IRM 350 PL Technical data and Installation dimensions

REDUCTION RATIOS	SAE HORSEPOWER (KILOWATTS)							
	CONTINUOUS		MEDIUM		LIGHT		PLEASURE	
	1800 RPM	2100 RPM	1900 RPM	2300 RPM	2100 RPM	2500 RPM	2100 RPM	2500 RPM
1.025 1.285, 1.580	368 (274)	429 (320)	542 (405)	656 (490)	697 (520)	827 (619)	739 (551)	876 (654)
2.077	368 (274)	429 (320)	535 (399)	647 (483)	697 (520)	827 (619)	739 (551)	876 (654)
2.636	363 (271)	424 (316)	511 (382)	619 (462)	674 (503)	803 (599)	739 (551)	876 (654)
2.863	350 (262)	409 (305)	484 (361)	586 (437)	649 (485)	773 (577)	739 (551)	876 (654)

POWER/SPEED RATIOS (KW/RPM)

1.025-1.580	0.1524	0.2129	0.2476	0.2616
2.077	0.1524	0.2100	0.2476	0.2616
2.636	0.1505	0.2009	0.2396	0.2616
2.863	0.1453	0.1900	0.2308	0.2616

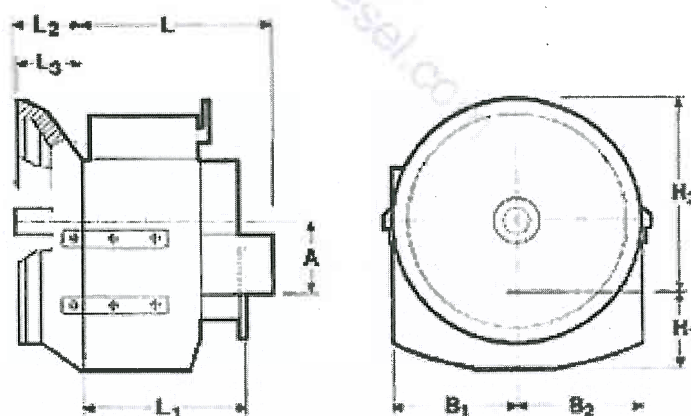
Max./Min. engine speed limits - Diesel: 3000/550 rpm

approx. dry weight: 219 kg (482 lbs)

Max. limit for continuous duty: 2400 rpm

approx. oil capacity: 19 liter (20.1 qt)

Metric Horsepower = SAE Horsepower x 1.014



Standard input rotation is for engines which rotate in an anticlockwise direction when looking on the fly-wheel end.

Dimensions	A	B ₁	B ₂	H ₁	H ₂	L	L ₁	L ₂	L ₃ (SAE 1)
mm	175	290	290	160	452	419	351.5	151	139
inches	6.89	11.41	11.41	6.3	17.79	16.5	13.83	5.94	5.47

TORSIONAL RESPONSIBILITY:

The responsibility for ensuring torsional compatibility rests with the assembler of the drive and driven equipment.

ZF can accept no liability for gearbox noise caused by vibrations or for damage to the gearbox, the flexible coupling or to other parts of the drive unit caused by this kind of vibration. Contact ZF for further information and assistance.

Ratings apply to marine transmissions currently in production and are subject to change without prior notice

SAFE OPERATION NOTICE:

The safe operation of ZF products depends upon adherence to technical data presented in our brochures. Safe operation also depends upon proper installation, operation and routine maintenance and inspection under prevailing conditions and recommendations set forth by ZF. Damage to transmissions caused by repeated or continuous emergency manoeuvres or abnormal operation is not covered under warranty. It is the responsibility of users and not ZF to provide and install guards and safety devices which may be required by recognized safety standards of the respective country (e.g. for U.S.A. - the Occupational Safety Act of 1970 and its subsequent provisions).

Subject to technical change without notice. For installation purposes, please request installation drawings.

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