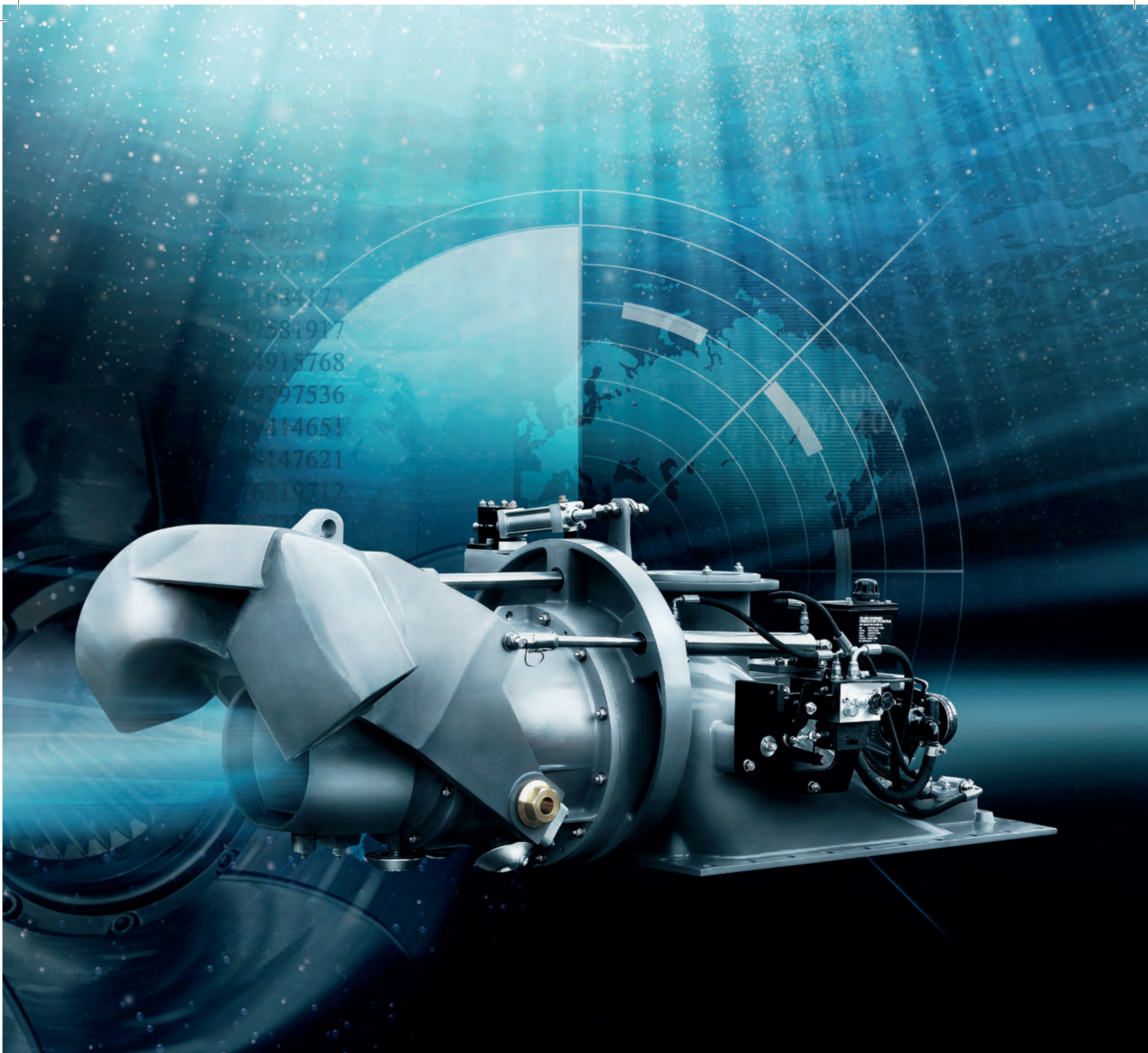


Designer's Guide

MJP ULTRAJET

A force to trust

MJP MARINE JET POWER

DESIGNER'S GUIDE







Designer's Guide

Version 4
2016-05-31

Introduction

Marine Jet Power is a world leading supplier of waterjets with several products marketed by the company group. This designer's guide is for the MJP Ultrajet series suitable for vessels with input powers from 100 kW upto 1340 kW per shaft. MJP Ultrajets feature a high efficiency single-stage axial flow pump design which delivers higher thrust than any other waterjet on the market. Manufactured from marine grade aluminium, the MJP Ultrajet product is both compact and lightweight whilst excelling in high quality standards and unrivalled durability.

The MJP Ultrajet boasts a fully integrated and compact design which eases installation and maintenance. The split duct reverse deflector and steering nozzle offers excellent manoeuvrability at both high and low speeds.

Scope of supply includes one or several waterjets complete with a selected control system. The control system comprises of integrated hydraulics driven by either mechanical or electronic controls. The system can include options such as additional steering stations and integration with interceptors and/or auto pilot.

The Purpose of the MJP Ultrajet Designer's Guide

The aim of the MJP Designer's Guide is to support operators, shipyards, consultants, project engineers and sales personnel:

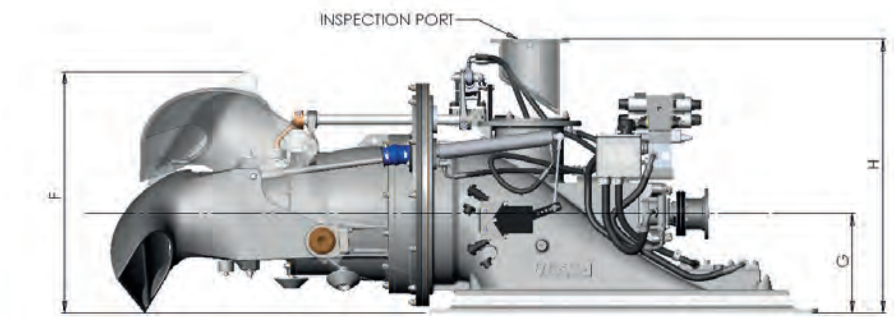
- **to better understand the principles of a jet propelled vessel**
- **to help in the planning of the layout of the vessel**
- **to design to the performances set up for the vessel**
- **to provide guidelines for the selection of appropriate jet unit**
- **to successfully integrate the propulsion system into the vessel**
- **to create awareness of the various possibilities and options in the MJP system**

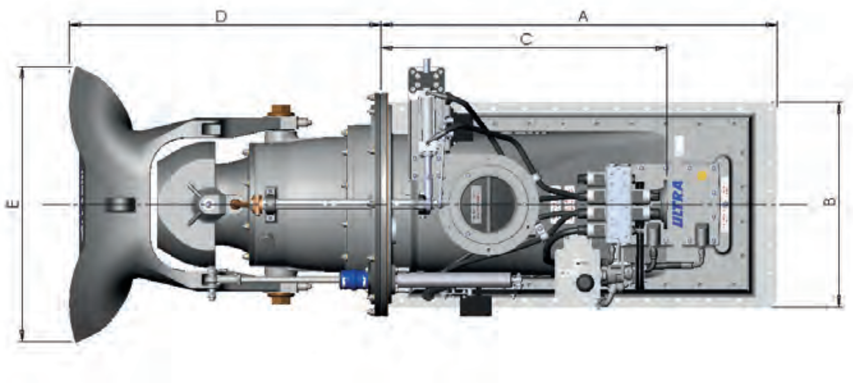
Why Marine Jet Power?

With 50 years' experience and over 15,000 MJP Ultrajet waterjets in operation, due to continued development and precision in impeller design, size for size the MJP Ultrajets pack a stronger punch than any other jet on the market. The main advantages are:

- Superior axial flow waterjet performance, thrust and cavitation margin.
- Compact and integrated design ensuring ease of installation and maintenance.
- "Tried and tested" durable design to withstand the harshest of environments and shallow waters.
- Suitable for high and low speed applications with both our standard and "HT" range.
- Split-ducted reverse deflector providing superior manoeuvrability for safe and precise close quarter harbouring allowing short turnaround times.
- Low vibration and waterborne noise, which is particularly important for military applications.
- Customised control systems with multiple control stations available.
- Collaboration with the National Engineering Design Laboratory ensuring maximum performance.


SEACAT SERVICES
SEACAT ENDEAVOUR





Note: All dimensions are for initial design evaluation only. Detailed data in the format of .dxf, IGES or STEP files are available. Please contact Marine Jet Power for further information.

MJP Ultrajet Range

The MJP Ultrajet series offers a range which typically suits crafts with engine output powers of between 150bhp to 1800bhp. With high propulsive efficiency, the MJP Ultrajet range is suitable for all craft types up to speeds of 50 knots.

MJP Ultrajet Model	Max. input power bhp (kW)	Max. drive Speed rpm	Dry weight kgs	Entrained Water kgs	A	B	C	D	E	F	G	H
251	350 (261)	3 600	153	33	1068	500	681	640	568	550	250	647
305	450 (336)	3 000	187	35	1140	560	750	784	694	595	265	700
340	600 (448)	2 700	250	41	1308	598	850	832	694	620	300	785
377	850 (634)	2 400	389	82	1443	636	1142	898	810	768	330	790
410	1000 (746)	2 200	440	107	1586	674	1240	990	900	860	360	785
452	1200 (900)	2 100	643	120	1705	810	1367	1170	1108	1048	430	900

MJP Ultrajet High Thrust Series

The MJP Ultrajet High Thrust (HT) is a derivative of the Ultrajet range. The HT delivers performance where high bollard pull, heavy load carrying, high acceleration and excellent cavitation margins are paramount. Advantages such as these are required for specific applications within the lower speed ranges. The HT range has been developed and optimised to deliver high performance within speeds upto and in around 30 knots. For a high speed applications, please refer to standard MJP Ultrajet range above.

MJP Ultrajet Model	Max. input power bhp (kW)	Max. drive Speed rpm	Dry weight kgs	Entrained Water kgs	A	B	C	D	E	F	G	H
251HT	370 (275)	3 000	175	30	967	560	654	842	694	615	265	700
305HT	400 (298)	2 700	205	38	1140	600	750	785	694	595	265	680
340HT	550 (410)	2 400	320	67	1140	600	818	935	810	735	290	785

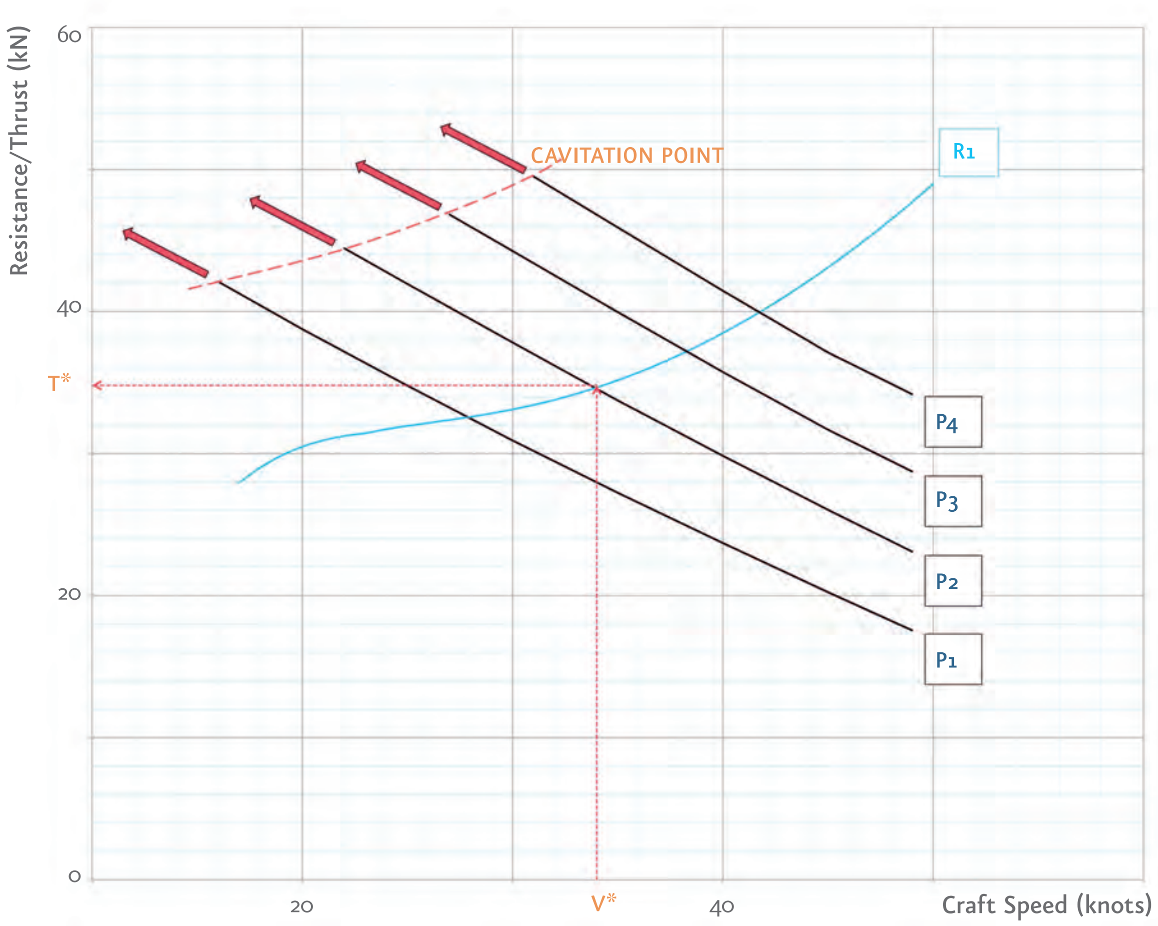
Selecting jet size and engine power

The jet range is presented on page #7 of this guide. The correct jet size is based on the following parameters:

- Vessel characteristics such as; hull type, waterline length and beam, displacement, longitudinal centre of gravity and hull deadrise angle.
- Vessel design speed.
- Engine power.
- Special requirements such as high bollard pull.
- Sufficient cavitation margin.

For the MJP Ultrajet series; with sufficient hull data, the hull resistance can be calculated in house. Best accuracy is achieved with either experienced real data or supplying Marine Jet Power with all accurate and relevant hull data (see application questionnaire for more details).

Let us consider an example of the use of this performance diagram. Considering the vessel is in steady motion; the value of the waterjet thrust T* is equal to the hull resistance value corresponding to the vessel speed V*.

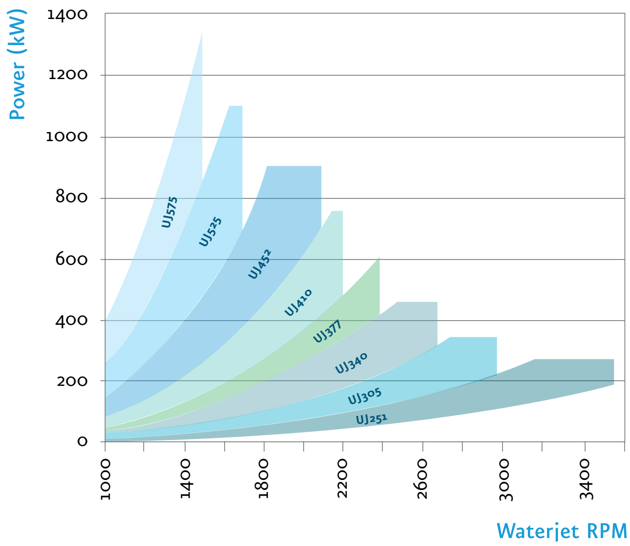


Example performance prediction

The performance prediction diagram establishes a relationship between calculated bare hull resistance, engine power and waterjet thrust for a given jet model. In the example above, four thrust curves are shown (P1, 2, 3 & 4) at varying engine power values in a function of vessel speed. Overlaying the calculated bare hull resistance curve (R1) results in intersection points which when interpolated, equate to the required thrust at a given vessel speed. Required thrust is directly proportional to the power required to overcome hull resistance.

Performance predictions are based on the craft information supplied; please refer to our application questionnaire for details.

The below chart is only a guide for suitable waterjet selection. Other critical factors such as the hull characteristics, application and ultimately the hull resistance will play a very important role in selecting the most suitable waterjet model. In all cases, please contact Marine Jet Power for advice.




STRIL HERKULES
STAVANGER
MSDC 12 DAUGHTER CRAFT

Impeller & Gearbox Selection

The chart below shows a set of power absorption curves for a range of impellers available. A selection of impeller types are available for all MJP Ultrajet models. The process of impeller selection is extremely important and will ensure that the waterjet absorbs 100% of the available power from the engine and helps to prevent against cavitation.

The correct impeller type can be selected once the engine with appropriate power is selected. The chart below demonstrates the process in which the impeller type and possibly the gearbox ratio are determined. In this example, the engine power is denoted as P1 and can be seen on the graph by a horizontal red line which meets the impeller absorption curves. If the engine has been selected to run without means of a gearbox, the engine running speed at the given power (P1) should intersect the line P1 and fall within the choice of impeller curves. Not only do we always recommend a gearbox for means of jet backflushing and clutch disengagement, a gearbox with a ratio other than 1:1 is often required to reduce or increase the drive speed and match one of our impellers. Using the graph below as an example, two vertical lines (R1 & R2) show the possible range of running speeds which will suit one of our impeller types. Giving an rpm range assists the boat builder in their decision making process for ratio selection.

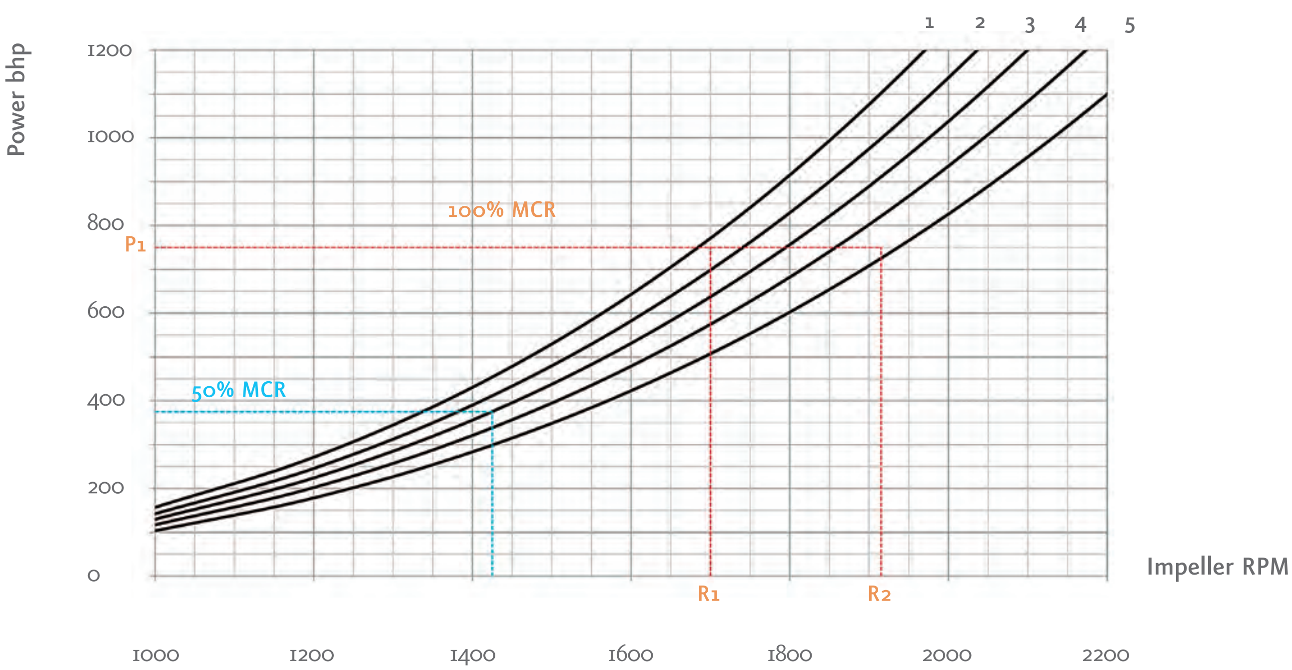
To determine the power absorption of the selected impeller at lower throttle settings, the same principles can be used by taking a lower engine power and following the impeller curve down to the intersection. Please note that this power is always less than the available engine power at the reduced speed, therefore with a jet drive the engine is never over-loaded at throttle settings less than 100%.

Transmission losses

If a transmission is to be installed between the engine and jet, an estimate of 3% transmission losses should be deducted from the rated engine power.

Note: Unlike propeller propulsion, waterjets absorbs a constant power regardless of increased loadings/ displacement and trim. This results in reduced engine loading which equates to a longer engine life. Impellers are available to match engines outside of those shown, please consult Marine Jet Power for an evaluation.

▼ The shaft rotation for all jet models is clockwise when viewed at the drive flange. Please consult your gearbox manufacturer to ensure correct installation



Design Considerations

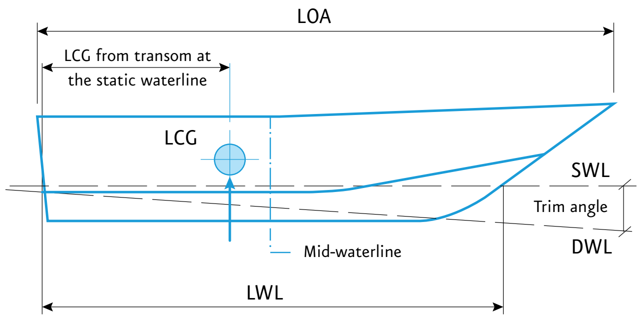
This chapter will explore the design and operation considerations for the successful application of marine waterjets and should give the designer a basic understanding of the requirements.

Hull types:

Typical monohedron:

• Keel and chine lines are parallel creating a constant deadrise angle from the transom forward to mid-waterline position. A good monohedron hull for jet drives will have a constant deadrise angle in the range of 8 to 25 degrees with most common being in the 12 to 18 degrees.

• Suitable for; high speed and moderate load carrying capacity.

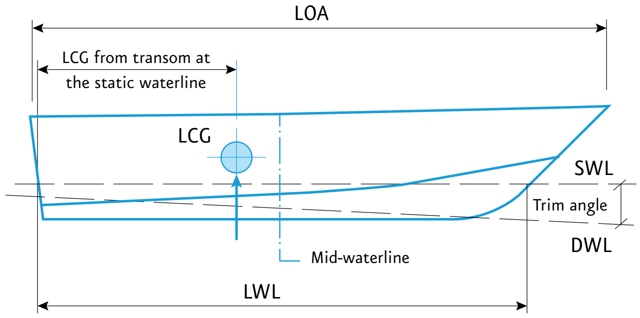


Warped hull form:

• Typically a decreasing deadrise angle from mid-waterline to transom.

• Better seakeeping and load carrying capability.

• Less resistance at the hump giving improved acceleration with a compromise on top speed due to an increased wetted planing area.



Multihulls:

• Twin and quad waterjet installations are a very common form of propulsion for catamarans and trimarans. Typically symmetric hulls with deadrise angles in the range of 10 to 18 degrees are best for jet drives.

To ensure uninterrupted flow into the waterjet, skin fittings and spray rail positioning are to be carefully determined with sufficient distance away from the intake flow. Please consult Marine Jet Power prior to hull construction to ensure optimised design for waterjets.

Installation

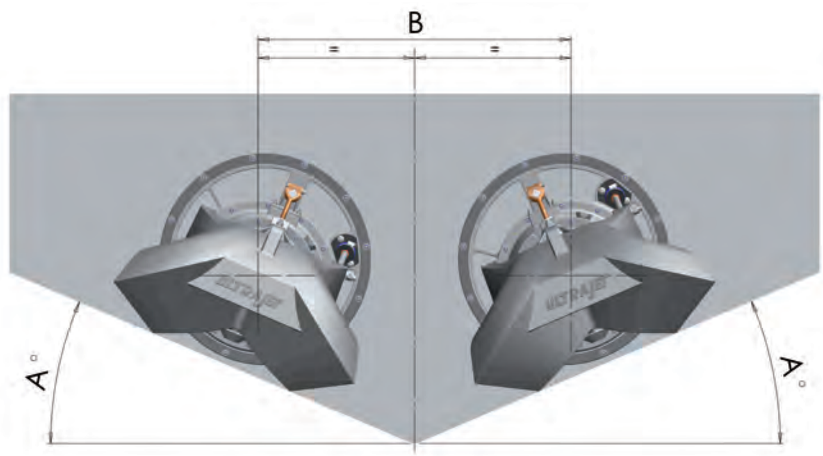
All MJP Ultrajets are usually mounted into the hull using either an intake block or by moulding/fabricating an opening during the hull manufacturing process. All propulsive thrust loads are transferred into the hull and not through the transom.

The jet unit is installed from inside of the hull with the reverse deflector removed. When installing a jet on the centreline of a boat (single or triple jet configuration), a smooth transition with a maximum of 5 degrees from the keel line to the forward face of the intake block is advised. This will ensure laminar flow into the pump intake. When installing jets off the craft centreline (twin, triple or quad configuration), the intake block should be mounted flush to the hulls deadrise.

For further details on intake installation, see "Hull Preparation" section within this guide.

The intake frame is supplied in epoxy coated marine grade aluminium which can be bolted or welded into the hull depending on the hull material. All stainless steel fasteners are supplied as an installation kit. Alternatively, Marine Jet Power can supply the appropriate drawings for the intake block to be fabricated by the boat builder.

Twin Jet Deadrise Installation Guide



JET MODEL	DEADRISE ANGLE A (DEGREES)					
	5	10	15	20	25	30
251	640	660	670	670	670	670
251HT	780	800	820	830	830	830
305	780	800	820	830	830	830
305HT	790	810	830	840	850	850
340	780	800	810	820	830	830
340HT	900	920	940	940	940	940
377	900	920	940	940	940	940
410	990	1010	1050	1070	1080	1080
452	1200	1235	1260	1280	1285	1285

MINIMUM DISTANCE B (mm)

Hull Preparation

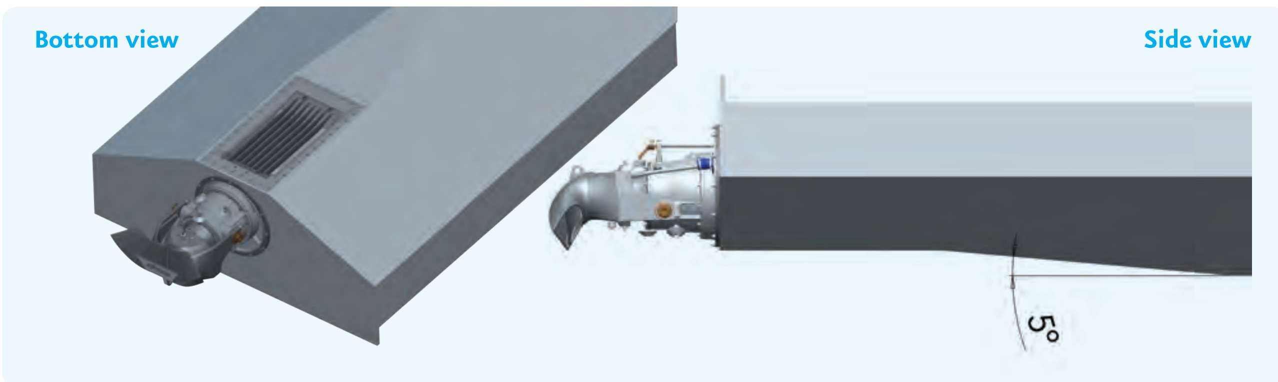
Twin Jet Installation

For the installation of twin MJP Ultrajets; the jets are positioned (using the advised minimum distance guide on page 13) on the hull deadrise. The aft face of the intake is positioned flush to the transom and is set into the hull mold prior to GRP layup and can also be welded into the hull for aluminium hull constructions. Please consult Marine Jet Power for further installation instructions and welding specifications.

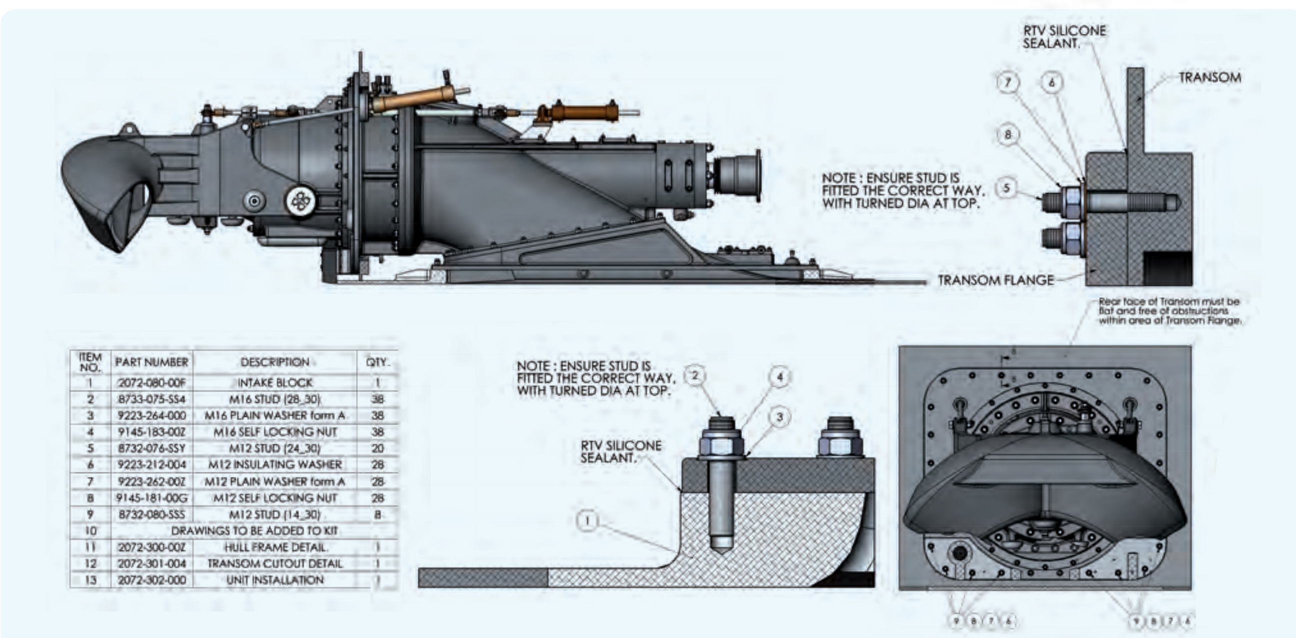
Single Jet Installation

The traditional and most common method of installing a single waterjet is to create a flat cut-out on the keel line. This can be done by either profile welding or laying a plant into the hull mold (depending on the hull material and construction). The image below shows a single MJP Ultrajet installed on craft centreline with a 5 degree smooth transition upto the intake to maintain undisturbed laminar flow into the jet.

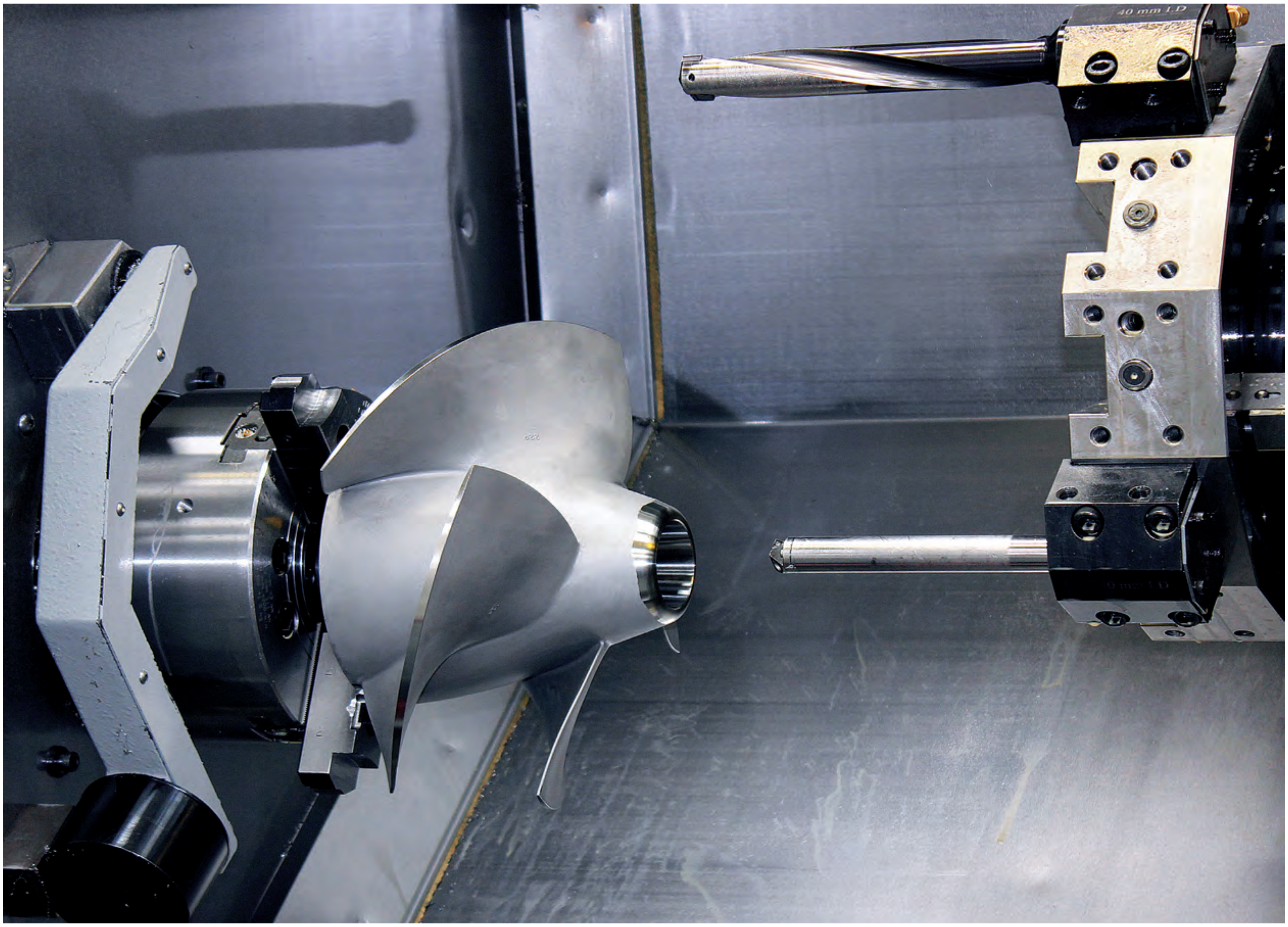
For further information on installation, please consult Marine Jet Power.



Below is an example installation guide for an aluminium hull build. For further information and documentation, please consult Marine Jet Power.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2072-080-00F	INTAKE BLOCK	1
2	8733-075-SS4	M16 STUD (28_30)	38
3	9223-264-000	M16 PLAIN WASHER form A	38
4	9145-183-00Z	M16 SELF LOCKING NUT	38
5	8732-076-SSY	M12 STUD (24_30)	20
6	9223-212-004	M12 INSULATING WASHER	28
7	9223-262-00Z	M12 PLAIN WASHER form A	28
8	9145-181-00G	M12 SELF LOCKING NUT	28
9	8732-080-SSS	M12 STUD (14_30)	8
10	DRAWINGS TO BE ADDED TO KIT		
11	2072-300-00Z	HULL FRAME DETAIL	1
12	2072-301-004	TRANSOM CUTOUT DETAIL	1
13	2072-302-000	UNIT INSTALLATION	1



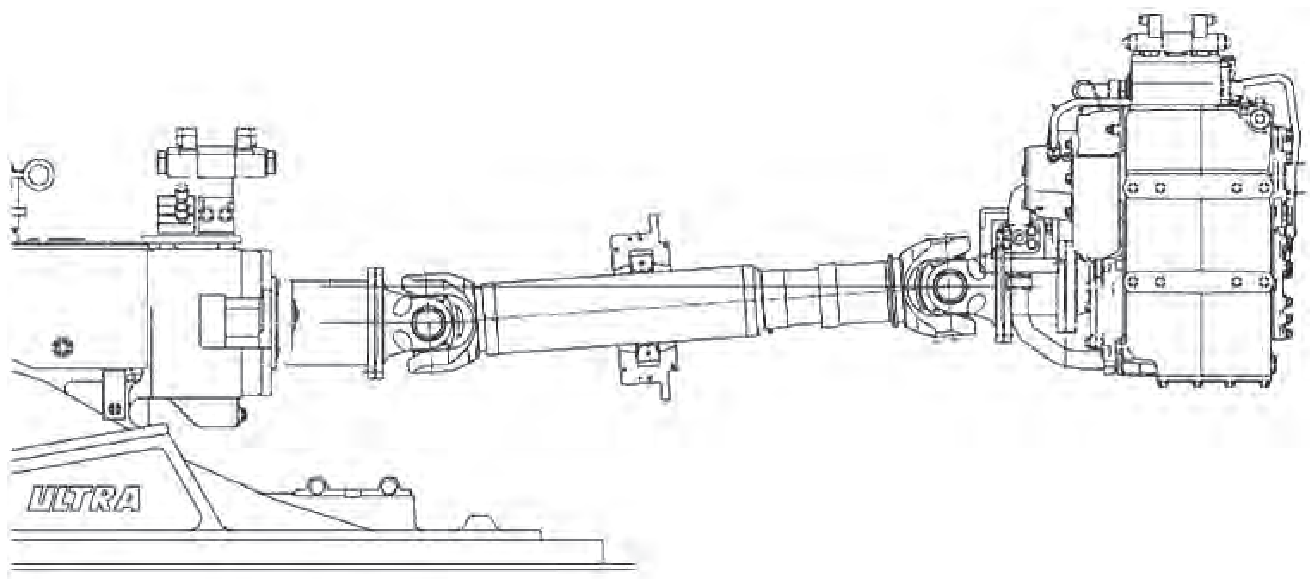
Materials and Processes

Through theoretical and empirical research, all materials which make-up the MJP Ultrajet series are high quality marine graded; providing characteristics which will withstand the harshest of environments.

- Proven materials giving consistent quality and reliable performance.
- High corrosion resistance.
- Lightweight.
- High strength.
- Cost effective.

The manufacturing processes are completed in house to ensure the highest standard of quality and accuracy.

Component	Material	Manufacturing Process
Intake Housing	Aluminium Alloy LM6M	Casted
Impeller	316 Stainless Steel	Investment Casted
Impeller Ring	316 Stainless Steel	Rolled Sheet Metal
Drive Shaft	S31803 Stainless Steel	Machined
Reverse Deflector	Aluminium Alloy LM6M	Casted
Steering Deflector	Aluminium Alloy LM6M	Casted
Steering Shaft	316 Stainless Steel	Machined
Reaction Case	Aluminium Alloy LM6M	Casted
Reverse Cylinder	316 Stainless Steel	-
Steering Cylinder	316 Stainless Steel	-
Outboard Steering Lever	Aluminium Bronze	Casted
Anode	Zinc/Aluminium/Magnesium	-
Fixings	316 Stainless Steel	Machined



Intermediate Shafting Arrangements

Marine Jet Power offer many types of intermediate shafting solutions, and can be customised to comply with both engine and waterjet requirements and also the available engine room space.

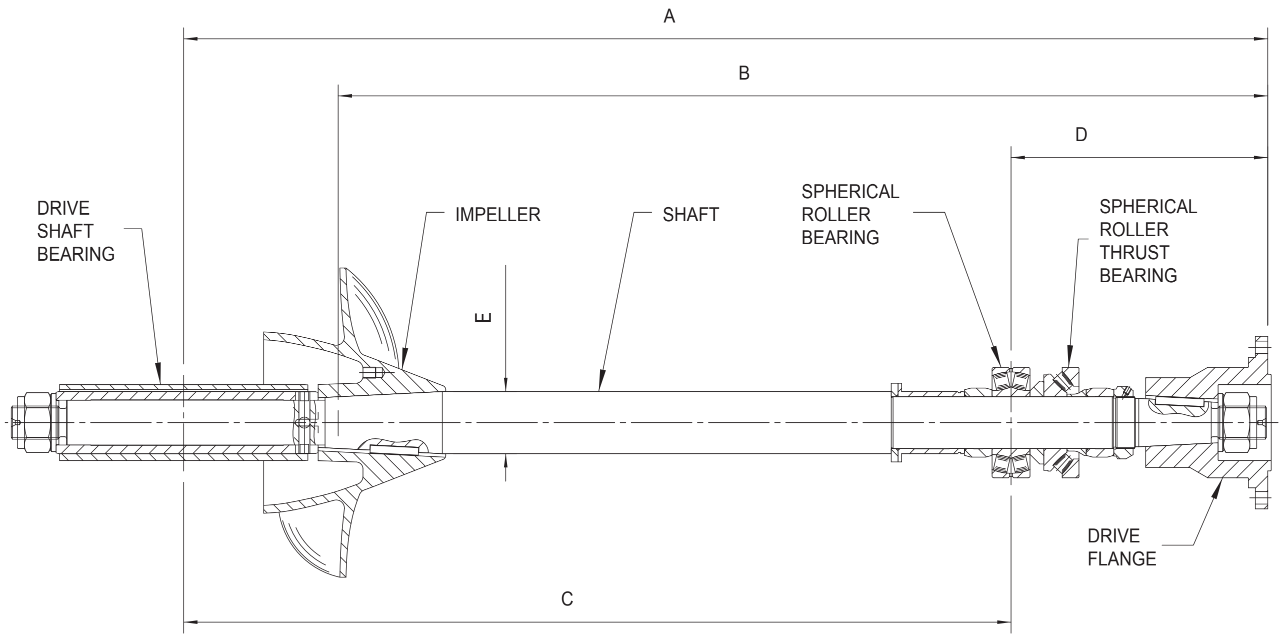
The design and selection of the intermediate drive shaft is extremely important for long term trouble free operation. An inappropriately sized or out-of-balance drive shaft can cause excessive vibration and noise culminating in premature failure of the universal or constant velocity joints. Collateral damage may then occur to peripheral components including the hull structure.

The main requirements of any drive system are to transmit the torque input to the main jet drive and provide an acceptable life. It must also allow for any misalignment and accommodate a small degree of axial movement. Propulsion thrust loads are absorbed within the waterjet construction and do not have to be allowed for within the driveline system.

Important: A torsional vibration analysis (TVA) should be carried out by the engine manufacturer. Moment of inertia data for the all waterjet models are shown on page 18. Critical speed checks for whirling of the waterjet drive shaft and transmission drive shaft should also be carried out.

Please consult Marine Jet Power for further details.

Moment of Inertia



▲ The above lines drawing represents a typical shafting arrangement, but may not be a representation in all cases. Please consult Marine Jet Power for further details.

The chart to the right shows our available impellers and drive flanges for each waterjet model with masses and moment of inertia data.

MJP Ultrajet Model	Dimension A (mm)	Dimension B (mm)	Dimension C (mm)	Dimension D (mm)	Dimension E (mm)
251	791	673	658	133	50,5
251HT	804	675	671	133	50,5
305	857	728	724	133	50,5
305HT	862,5	721,5	729,5	133	50,5
340	1006,5	866,5	832,5	174	60,5
340HT	1263	1106	972	291	75
377	1263	1106	972	291	75
410	1426	1202	1122	304	82
452	1572	1348	1200	372	90

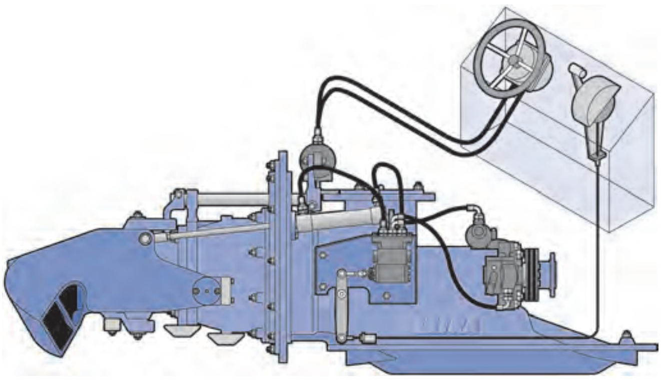
		4 bladed Impeller	5 bladed Impeller	Impeller Shaft	FLANGE TYPES														
					DIN 120	DIN 150	DIN 180	DIN 225	DIN 250	DIN 285	SAE 1510	SAE 1600	SAE 1700	SAE 1800	CV 21	CV 30	CV 32	CV 48	
251		0,030	0,058	0,003	0,007	0,010					0,009	0,014							Moment of Inertia (kg m^2)
		7,34	8,00	7,60	3,75	4,21					4,20	4,99							Mass (kg)
251HT		0,068	0,078	0,003	0,070	0,010					0,009	0,014							Moment of Inertia (kg m^2)
		12,24	13,03	10,73	3,75	3,75					4,20	4,99							Mass (kg)
305		0,068	0,078	0,002	0,007	0,010					0,009	0,014	0,023						Moment of Inertia (kg m^2)
		12,24	13,03	11,80	3,75	3,75					4,20	4,99	5,85						Mass (kg)
305HT		0,115	0,170	0,002	0,007	0,091					0,009	0,014	0,023		0,029	0,020	0,033		Moment of Inertia (kg m^2)
		15,93	16,20	11,80	3,75	4,21					4,20	4,99	5,85		5,34	7,29	8,56		Mass (kg)
340		0,115	0,170	0,008		0,091	0,016				0,009	0,014	0,026	0,030					Moment of Inertia (kg m^2)
		15,93	16,20	19,08		4,21	7,93				4,35	4,99	6,22	8,98					Mass (kg)
340HT		0,180	0,290	0,011		0,091	0,016				0,009	0,014	0,030	0,030					Moment of Inertia (kg m^2)
		19,41	22,00	24,20		4,21	7,93				4,35	4,99	7,05	8,98					Mass (kg)
377		0,180	0,290	0,023			0,016				0,010			0,030					Moment of Inertia (kg m^2)
		19,41	22,00	37,50			7,93				4,750			8,98					Mass (kg)
410		0,307	0,440	0,032			0,016	0,054			0,010							0,077	Moment of Inertia (kg m^2)
		29,31	34,80	47,00			7,93	13,51			4,98							14,92	Mass (kg)
452		0,420	0,580	0,058				0,090	0,070										Moment of Inertia (kg m^2)
		33,60	38,20	65,70				17,88	20,30										Mass (kg)

Control systems

High performance vessels require versatile, functional control systems; the MJP Ultrajet Series takes full consideration of proven technology, ease of installation, functionality, reliability and economics. Marine Jet Power offer a wide range of standard control systems from an easy to install and operate hydro-mechanical system, to a full featured DNV class approved electronic joystick system.

The following provides an overview of the controls, steering and hydraulics systems available:

Hydro-mechanical (HM) Control System



The hydro-mechanical Control System provides proportional operation of the reversing deflector when actuated by means of a push/pull cable from the helm. This system is particularly suited to very wet inboard conditions, or where electrical systems cannot be given sufficient protection.

The helm lever using a push/pull cable is connected directly to the spool of the hydraulic control valve incorporated into the hydro-mechanical control unit. When the lever at the helm is moved, the oil is directed to the appropriate side of the reverse cylinder until the feedback system shuts off the flow. The reverse deflector remains in the selected position until signalled from the helm and the helm lever provides a clear indication of the current position of the reverse deflector.

The HM control is available on all models up to and including the MJP Ultrajet 410.

JetMaster Control Systems

JetMaster Pro (JMPRO) Control

The JetMaster Pro is a PLC based control system operating the reverse deflector(s) proportional to helm lever movement. This system is available for single or multiple installations and is usually utilised with single/twin levers for reverse and an electronic helm wheel for steering operation.

JetMaster Joystick (JMJ) Control

The JetMaster Joystick accurately controls forward, reverse and neutral positioning of the boat using vectored thrust from the jet drive(s). The remote mounted PLC receives a signal both from the control head or joystick and the reverse deflector position indicator. The PLC compares both signals and powers the reverse deflector(s) via our integrated hydraulics system to the selected position. At this position the signals are balanced and the reverse deflector is held in position until the signal is modified by the helm. As part of our scope of supply, the JetMaster system includes our emergency backup system with an integrated position indicator screen. Please consult with Marine Jet Power if you require a bespoke system.

The JetMaster Control system is offered as a 12 or 24 VDC system, and integration of bow thruster, interceptors and auto pilot is also available.

The JetMaster Joystick controls are available on all MJP Ultrajet models.

JetMaster 2

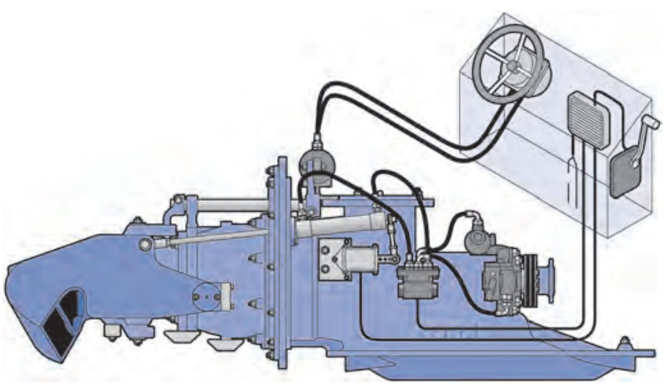
The JetMaster 2 Control System is designed to provide synchronous control of a twin Marine Jet Power propulsion system together with control and interlocking to main engines and gearboxes. The JetMaster 2 system communicates via CANbus protocol, and the hardware can be configured to suit specific customer requirements. Designed to withstand the harshest of environments, this system offers complete redundancy and is DNV Class approved.

Electro-hydraulic Jog (EHK) Control

The economical Electro-hydraulic Proportional control operates the reversing deflector proportional to helm lever movement. The EHK system is based on Kobelt single or twin lever helm units, amplifier and position feedback units.

The hydraulic jog control is ideal where cost is a major consideration. With plug and play components, this control system is straight forward to install with little specialist experience required.

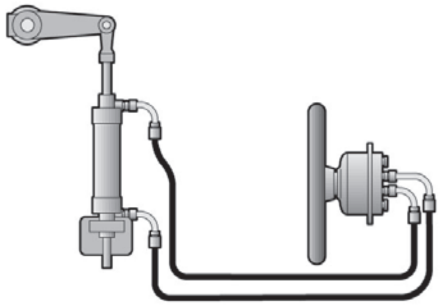
The EHK control system is available for all MJP Ultrajet models.



Steering Control Options

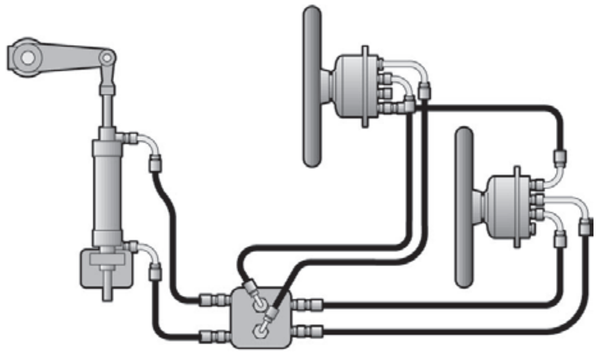
The MJP Ultrajet steering options consist of the following:

- Balanced steering deflector.
- Unbalanced steering deflector.
- Balanced steerable nozzle.

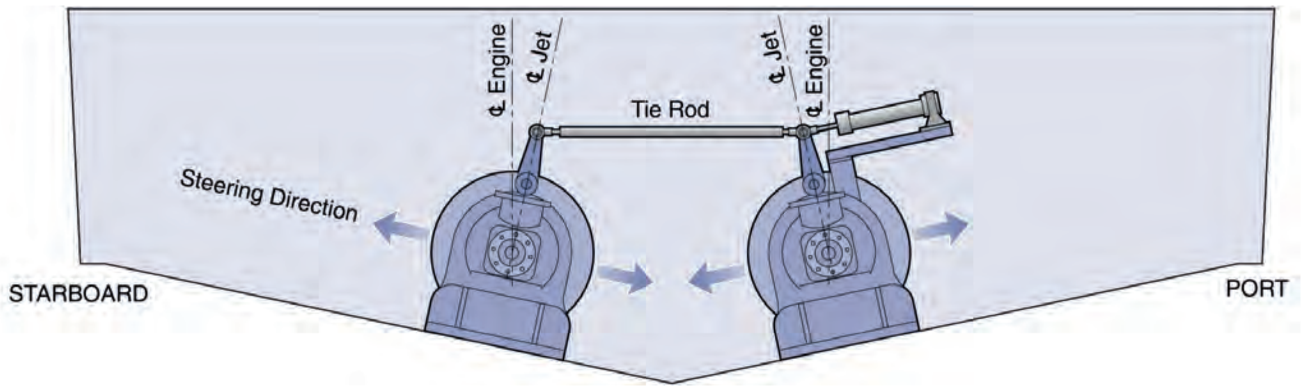


Whether it's for small or large waterjets, high or slow speed operations, Marine Jet Power have a solution. Our new balanced steerable nozzle has been optimised for high performance steering without the losses expected when steering at high speeds.

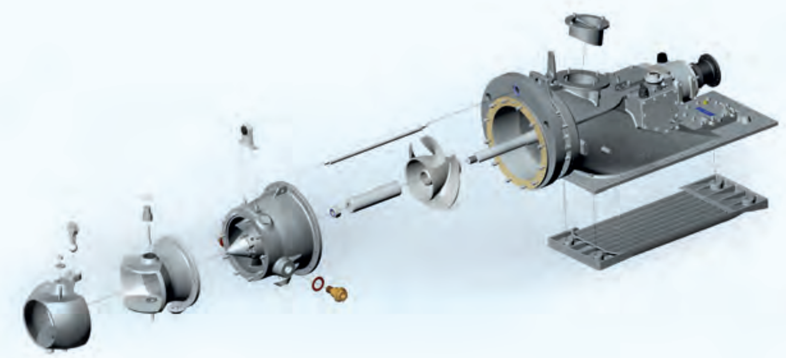
The standard manual hydraulic steering system can be used in single or multi-station configurations. A total steering wheel movement of 1 to 1 ½ turns should be used as a greater number of turns gives poor control during low speed manoeuvring. Alternatively the steering can be incorporated into a full electro-hydraulic control system with a single 2 axis joystick controlling both steering and reverse functions.



In multiple installations, the jet steering control is linked using either a mechanical or electronic tie-bar. This allows multiple jets to be operated simultaneously



Innovation and Design (CAD)



BOM ID	Description	Qty
1	2025-008-01B-1	1
2	2031-060-006-1	1
3	204 'O' Ring (9327)-2	1
4	206 'O' RING (9329)-1	1
5	9151-336-000-1	1
6	9411-472-00Q-1	1
7	9512-216-00X-1	1

All models in the MJP Ultrajet series are modelled in SolidWorks 3D software and can be exported to naval architects, designers, and boat builders to assist in the design phases and also operators for aftermarket support. Designers and naval architects import the 3D files into the vessel general arrangement with ease, speed and accuracy. This ensures fabrication drawings and fitting arrangements are accurate and optimise the engine/jet room space. Layouts and service routings are conveniently positioned in the design and accurately followed in production.

All MJP Ultrajets are modelled in 3D which aids both the boat builder/designers and also our in-house R&D department. The software also serves the manufacture and quality control of parts and assemblies. The detail behind each model not only identifies parts but also torque figures and levels of lubrication. As an aftermarket tool each sub-assembly can be selected, exploded and parts can be easily identified for service and maintenance. Service and maintenance manuals are driven from our upto date 3D models and can be accessed with just an internet connection giving quick and easy spare part ordering.

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
132216-2013-AQ-SWE-SWEDAC

Initial certification date:
06, July, 1995

Valid:
08, March, 2016 - 15, September, 2018

This is to certify that the management system of

Marine Jet Power AB

Hansellisgatan 6, 754 50, UPPSALA, Sweden

has been found to conform to the Quality Management System standard:
ISO 9001:2008

This certificate is valid for the following scope:
Development, sales, service and supply of water jet propulsion systems

Place and date:
Solna, 10, November, 2015

SWEDAC ACKREDITERING
1053
ISO/IEC 17021

For the issuing office:
DNV GL - Business Assurance
Box 6046/Hemvärnsgatan 9, 171 06,
Solna, Sweden

Ann-Louise Pått
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.
ACCREDITED UNIT: DNV GL Business Assurance Sweden AB, Box 6046, 171 06 Solna, Sweden. TEL:+46 8 587 940 00. http://assurance.dnvgl.com

Standards, Rules & Classifications

Marine Jet Power is an ISO 9001 approved company.
Marine Jet Power can certify to any specific classification society if required.

	Inquiry date:

Application Checklist

Customer

Company	
Contact	
Address	
Telephone	Email

Hull details

Laden Displacement	ton/kg/lb	Planing Mono Hull
Lightship Displacement	ton/kg/lb	Semi-Planing Mono
Waterline Length (LWL)	m/ft	Planing Catamaran
Waterline Beam	m/ft	Semi-Planing Catamaran
Deadrise at Mid-Waterline	degrees	Displacement Craft
Deadrise at Transom	degrees	Other (describe below)
Draft at Transom	m/ft	
LCG from Transom at Max. Displ.	m/ft	
Frontal Area	sq.m/sq.ft	
Required Boat Speed (Laden)	knots	
Required Boat Speeds (Lightship)	knots	
Hull Material (GRP/Alu/Steel)	–	

Engine details

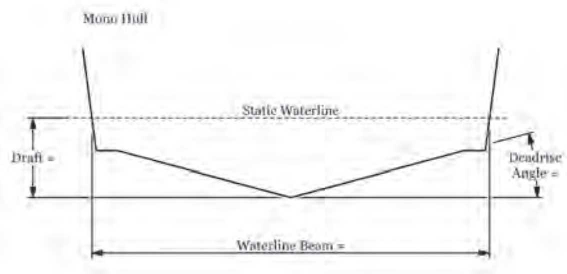
Single	Twin	Triple	Quad	Other
Make	Model			
Max. Power	hp/kW	@	rpm	

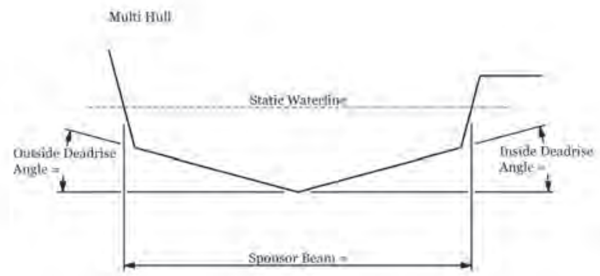
Preferred Gearbox

Make	Model

Marine Jet Power will specify impeller selection and the optimum reduction ratio for your project.

Use the following diagrams to help show the details of your hull(s).





A force to trust

DESIGNER'S GUIDE

www.marinejetpower.com

MJPs' website is a vast source of educational information on waterjet propulsion as well as providing downloadable application and technical data on the full range of our waterjet products and control systems.

MJP DRB

The MJP DRB jet with a Double Reverse Bucket offers an inboard hydraulic design with superior performance and unmatched service life in for instance Commercial Crafts, Coast Guards, Navy Applications and Yachts.

MJP CSU

The traditional MJP CSU jet with a Compact Steering Unit off ers a classic design with superior performance and unmatched service life in for instance Commercial Crafts, Coast Guards, Navy Applications and Yachts.

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