



HamiltonJet
blue ARROW



_____ Cruising. Docking.

_____ Port. Starboard.

_____ Ahead. Astern.

_____ Circles.

_____ Always.





blue ARROW

A revolution in waterjet control systems

blue ARROW® is not just a waterjet control system – it is a totally integrated electronic control package for single or twin waterjet propelled vessels fitted with HJ292, HJ322, HJ364 or HJ403 model waterjets. blue ARROW provides control of throttle and gearbox, together with ahead/astern and steering functions, to give the operator complete control of vessel manoeuvring.

Skippers new to waterjet propulsion will find blue ARROW provides a smooth and safe transition from operating conventional propulsion control systems to operating waterjets. The system makes it easy to learn and adjust to the many advantages of waterjets, while more experienced waterjet operators will find blue ARROW simplifies manoeuvring controls to allow them to focus on the other important tasks at hand and complete precision manoeuvres in a wider range of operating conditions.

Central to blue ARROW's ease of use is the innovative MouseBoat™ – the most intuitive docking control device available today. While it has been described as “beyond clever” and “simply genius”, it is just the next step in HamiltonJet's evolution to bring the many manoeuvring advantages of waterjet propulsion to the fingertips of all skippers.



Features & Benefits

Complete Propulsion & Vessel Control Package

- All components provided by HamiltonJet – including waterjet(s), waterjet control interface, engine/gearbox control interface, helm station control input devices, and cabling
- Integrated hydraulic and electronic control components (waterjet mounted)

Intuitive User-Friendly Controls

- Ease of vessel operation and manoeuvrability – vessel controls are quickly learned and understood
- Configurable for up to three helm stations
- Quick transition between high and low speed control
- Attractive and ergonomic bridge console components
- Wide range of engine, gearbox and autopilot interfaces
- PC application tool for quick and intuitive commissioning

Reliable & Safe

- On-bridge independent backup system at each station
- Clear status indication and system monitoring
- Multiple levels of redundancy providing high system availability
- Comprehensive status indication, alarms and event log (extractable using a PC tool)
- Lockable stations



Worldwide Local Support

- Single supplier for waterjet and control service and support
- Support available to boat builder and owner at all stages of build, commissioning and operational lifetime through HamiltonJet's extensive distributor network



Vessel Suitability

- Applications: Commercial vessels, fishing boats, workboats, military craft, pleasure yachts
- Hull Type: Monohull or catamaran
- Vessel Length: 8-16 metres (guide only – some vessels outside this range may be suitable)
- Vessel Weight: 3-30 tonnes
- Engine Input Power Range: 200-900kW (270-1340hp)

Scope

- HamiltonJet waterjet models HJ292, HJ322, HJ364 and HJ403
- Single and twin installations
- Up to three helm stations

Advantages

blue ARROW is superior to other waterjet control systems by providing...

- Reduced weight and easier installation compared to manual hydraulic control systems
- Synchronised electronic steering for twin waterjet installations (no steering tie rod required)
- Sideways vessel movement achieved by using automated thrust vectoring jet control (in twin jet installations only)
- Intuitive user interface
- "Plug & Play" field replaceable modules
- Dual redundant battery feeds (24V required)
- Supports all major engine and gearbox types
- Compatible with all popular auto-pilots

Scope of Supply

- **Single or twin blue ARROW waterjet/s** – includes integrated hydraulics, intake block and installation kit.
- **Jet Interface Module/s (JIM)** – one mounted on each jet unit
- **Engine Interface Module/s (EIM)** – connects to engine and gearbox
- **Pre-terminated Cables** – variety of lengths available
- **Station Control Panel (SCP)** – one to be fitted at each helm station
- **Control Input Devices (CIDs)** – a set is attached to each SCP
- **Alarm Sounder**

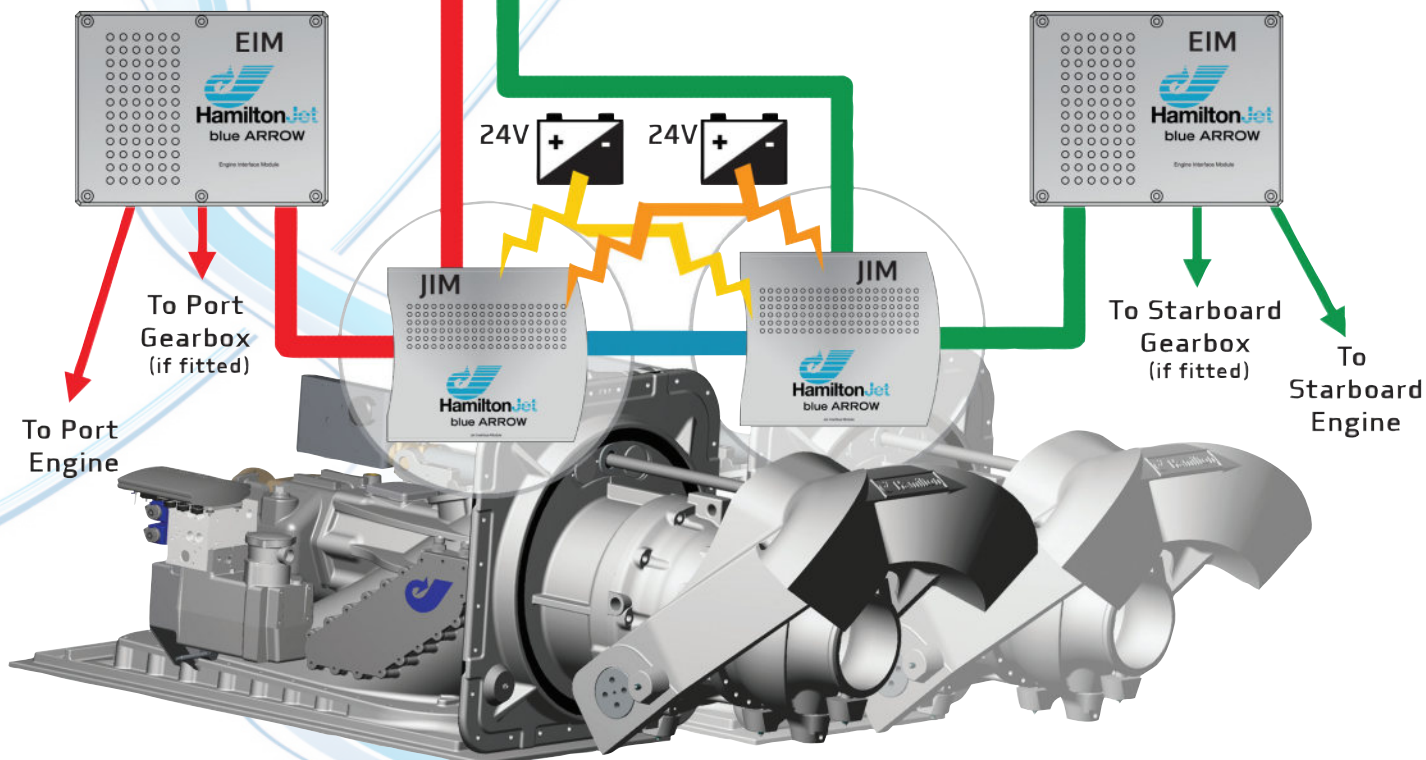
Not Included in Standard Scope of Supply...

- Mechanical Throttle Actuator (if required in special circumstances only)
- Helm wheel
- Batteries & charging system
- Circuit breakers

To SCP & CIDs at additional helm station/s (maximum of 3).



Daisy-chain connection between CIDs (Note: CID combination may be determined by number of waterjets installed)



Scope of Supply (Continued)

blue ARROW utilises a digital microprocessor system communicating using a dedicated protocol CANbus network. It employs a PC-based configuration process for system setup, tuning, diagnostics and online ship registration at commissioning. Two independent 24V power sources are required for system redundancy.

Station Control Panel (SCP)

- Provides a simple, intuitive user interface for the blue ARROW electronic control system
- Back-lit LCD screen displays a wide range of system status information, and includes comprehensive feedback and alarms.
- One panel per station
- Jogstick control while in back-up mode
- Integrated autopilot interface



Control Input Devices (CIDs)

Specifically designed for blue ARROW, these CIDs provide the most user-friendly and intuitive features available...

- Intelligent “plug & play” devices
- Pre-calibrated at factory
- Environmentally sealed for internal or external mounting

Helm Unit

- Controls vessel heading
- Accepts 3/4” taper bore steering wheel (additional to standard scope of supply)

Dual “Single Lever” Control

- Each lever controls the reverse deflector and engine throttle for each driveline
- Lever movement around the central zone raises and lowers the reverse deflector without altering engine throttle. Once the reverse deflector is fully raised or lowered, further movement of the Dual Control Lever increases engine throttle
- Crash stop manoeuvres are easily facilitated with these levers



MouseBoat Manoeuvring Controller

- A multi-axis device to simplify and improve control of the vessel during low speed and docking manoeuvres
- Hold function allows the vessel to be held by thrusting against an object or wharf
- Throttle gain control to adjust vessel responsiveness for different conditions

Jet Interface Module (JIM)

- Fully integrated to the waterjet
- Monitors oil status in hydraulic system
- Backup circuit and dual battery feed input (24V)

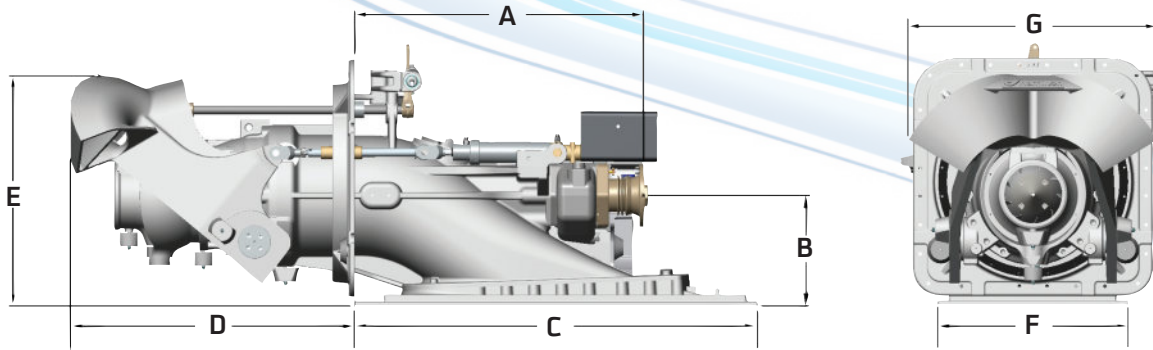
Engine Interface Module (EIM)

- Controls engine & gearbox (if used)
- Available to suit wide variety of electronic throttle demand signals (optional manual throttle actuator control available in special circumstances)
- Configured for a specific engine pre-delivery

Waterjet Specifications

Dimensions & Power/RPM Inputs

blue ARROW comprises the largest waterjet models in HamiltonJet's HJ series. These highly efficient propulsion units are suitable for propelling craft typically 8-16 metres in length and operating at speeds ranging from zero up to 50 knots.



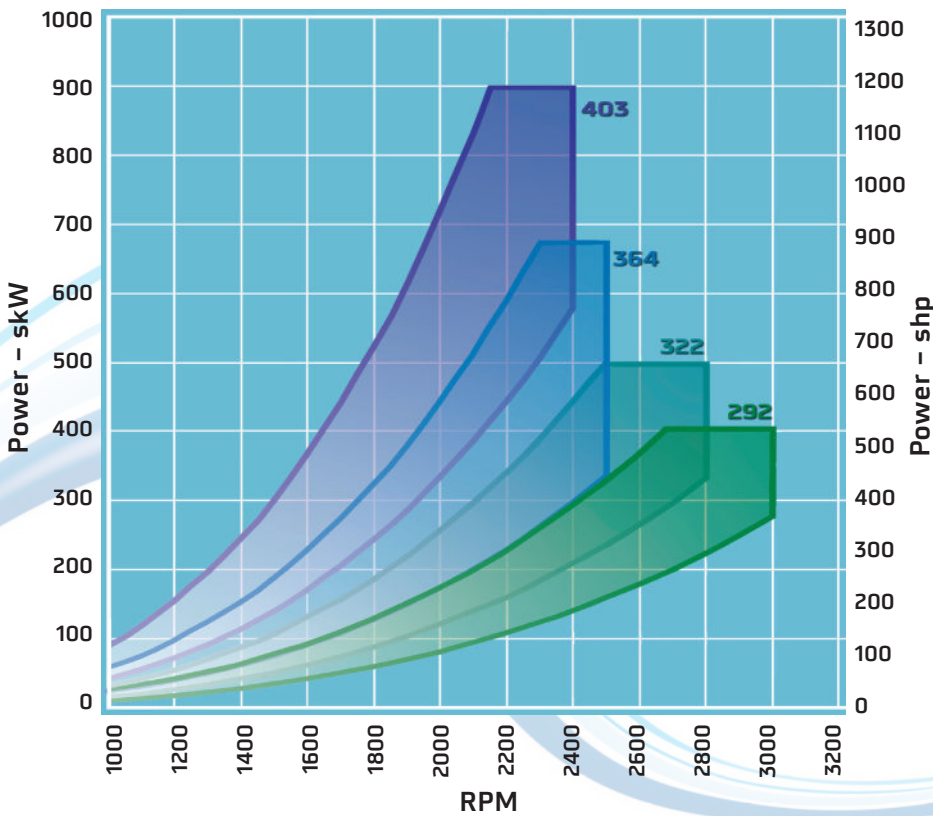
Layout and dimensions shown are indicative only for initial design purposes, based on jets with optional 0° intake block which positions the jet parallel to the hull bottom. An 5° intake block, which facilitates close direct drive coupling of the engine, is available.

Consult HamiltonJet for more detailed information.

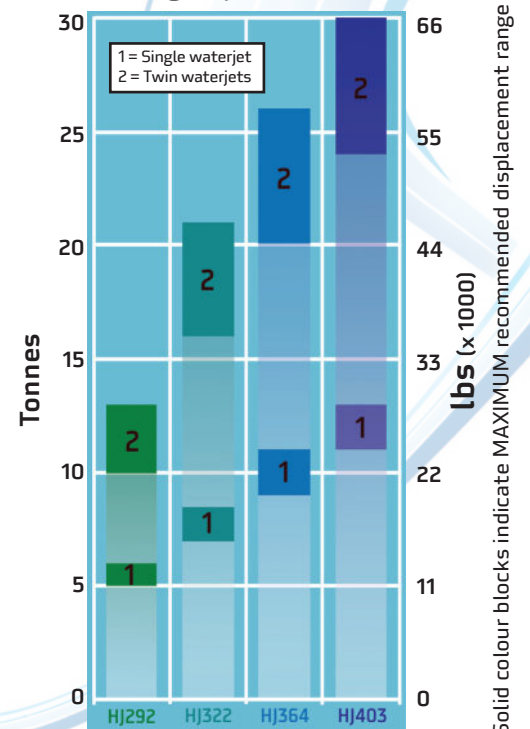
Jet Model	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Dry Weight (kg / lbs)	Maximum Power (kW / hp)	RPM (Maximum)
HJ292	681	290	1072	715	620	495	608	213 / 470	400 / 540	2650-3000
HJ322	866	320	1250	796	720	550	680	297 / 655	500 / 670	2550-2800
HJ364	937	360	1410	860	765	621	747	470 / 1036	670 / 900	2300-2500
HJ403	1053	400	1466	1027	837	690	803	713 / 1572	900 / 1200	2240-2400

NOTES: Input RPM subject to suitable cavitation limits – lower RPM figure is always preferred. Higher power inputs will restrict input RPM range. Weight based on 5° Intake Block option. 0° option will be slightly lighter.

Power/RPM Envelopes



Maximum Recommended Displacement (high speed craft)



Note: Multiply weights ranges shown above by 2 to get Maximum Recommended Displacement for slow speed craft

Solid colour blocks indicate MAXIMUM recommended displacement range

MOUSEBOAT™

The Revolutionary Manoeuvring Control Device for blue ARROW®

HamiltonJet's MouseBoat is an innovative concept in low speed manoeuvring control for waterjet powered boats. MouseBoat makes it extremely easy for anyone to manoeuvre a vessel safely in a wide range of operating conditions.



Note: Due to HamiltonJet's commitment to continual product improvements, the image shown here may differ in appearance from actual MouseBoat device

Features & Benefits

- Complete low speed manoeuvring control of a vessel from a single-handed device – integrates controls for ahead/astern, steering and engine throttle
- Intuitive action – move the MouseBoat and the vessel follows
- Improves safety and reduces collision risk in tight docking situations – operator can react instinctively to changing situations without having to think about what to do
- Intuitive astern steering control - correct steering sense quickly achieved when going astern
- Fingertip adjustment of engine throttle for improved response and performance in strong wind or current
- Safety “spring centred” action – on release MouseBoat returns controls to “zero speed” neutral position
- Provides low speed cruise control with autopilot enabled or holding vessel against an object or dock
- “Hold” function to set a manoeuvring thrust - useful for holding vessel against a dock
- Ergonomic design provides a comfortable and stable hand position for operation in all conditions
- Unique shape of MouseBoat means the operator does not have to look down to know position of the controller
- Totally integrated with and exclusive to the HamiltonJet blue ARROW control system – high reliability, easy installation, high level of system backup and support

MOUSEBOAT™

The Revolutionary Manoeuvring Control Device for blue ARROW®

Functionality

- Twin Waterjet Installation...
 - Three axis movement – forward/back, side-to-side and rotation
 - Controls ahead/astern, sideways movement and vessel heading
- Single Waterjet Installation...
 - Two axis movement – forward/back and rotation
 - Controls ahead/astern and vessel heading
- Adjustable Responsiveness...
 - Engine idle RPM can be controlled on the Station Control Panel
 - Maximum manoeuvring thrust can be adjusted using the “+” and “-” buttons on the MouseBoat
- MouseBoat Position Hold...
 - “Hold” button sets thrust and steering settings
 - Engine RPM can be increased or decreased while maintaining hold
 - Hold is released on next movement of MouseBoat
 - Autopilot can be enabled to maintain heading with thrust settings held

Operation

- The blue ARROW control system is programmed to translate MouseBoat movement into the thrust vectors required to carry out a full range of manoeuvres, in particular sideways (with twin jet installations only)
- Control is switched between low speed MouseBoat and high speed wheel/levers simply by pressing the “Take Control” button on the required device when both devices are synchronised (indicated on the Station Control Panel)
- Move the MouseBoat in the direction you require the vessel to travel or rotate it to port or starboard to adjust heading of the boat in that direction. Ahead/astern, sideways movement and rotation can be combined
- Moving or rotating the MouseBoat further in the direction of travel will automatically increase engine RPM to increase boat speed or rate of turn. Releasing the MouseBoat will return it to the central “zero speed – straight ahead” mode

Scope of Supply

- MouseBoat is the only low speed manoeuvring device available for the blue ARROW control system
- One MouseBoat is supplied per control station (up to three stations)
- 2m of cable supplied to connect MouseBoat to blue ARROW system at each control station



Twin waterjet function above

Single waterjet functionality below



Application Examples

Since entering the market in 2005 blue ARROW has been installed on a wide range of successful vessels...



18.5m Police Patrol Vessel

Left: Auckland Police & Customs
Waterjet Model: Twin HJ403
Engines: Twin MTU 808kW @ 2100rpm

blue ARROW controls allow this vessel to operate within confined waterways and around other vessels with a high degree of control and safety. Three control stations with a MouseBoat at each mean the skipper can position himself for best visibility in a variety of situations.

13.6m Superyacht Tender

Right: Vaudrey Millar 007
Waterjet Model: Twin HJ322
Engines: Twin Yanmar 353kW @ 3300rpm

This tender is driven by many skippers with a variety of experience. For those new to waterjet propulsion, blue ARROW makes it very easy to learn how to manoeuvre a vessel and provides a seamless transition from propellers to waterjet controls.



11.3m Rescue Craft

Left: Naiad RIB
Waterjet Model: Twin HJ322
Engines: Twin Yanmar 272kW @ 3300rpm

The ability to train new skippers more easily is a key reason for the use of blue ARROW in rescue vessels. What's more, the improved manoeuvrability available when working around other vessels or people in the water ensures rescues are carried out more quickly and safely.

17.6m Crew / Pilot Boat

Right: Port Taranaki Workboat
Waterjet Model: Twin HJ364
Engines: Twin MTU 552kW @ 2300rpm

Accurate control in a variety of sea conditions is crucial for safe transfer of oil rig crew and pilots in the open ocean, so blue ARROW's intuitive MouseBoat docking controller is a major advantage.



Pleasure Craft

Right: Oyster LD43
Waterjet Model: Twin HJ292
Engines: Twin Yanmar 353kW @ 3300rpm

For recreational vessels blue ARROW provides a safe and simple control interface to ensure every boating experience is a good one.



11.7m Rescue Craft

Left: AMF 1170 QRV RIB
Waterjet Model: Twin HJ322
Engines: Twin Cummins 353kW @ 3400rpm

With multiple levels of redundancy, blue ARROW controls will ensure that you can get back to port safely if something goes wrong. This is important in any rescue operation, or anywhere you are a long way from home.

15.2m Passenger Ferry

Right: Clipper II Pine Harbour Ferry
Waterjet Model: Twin HJ364
Engines: Twin MTU 552kW @ 2300rpm

The ability to safely and easily manoeuvre against wind and tide in a confined waterways is an important advantage for small commuter ferry services such as this one. It allows for faster passenger transfers and improves economy when meeting a regular service timetable.



11.8m Military RIB

Left: Naiad Military Patrol Craft
Waterjet Model: Twin HJ322
Engines: Twin Cummins 400kW @ 2600rpm

Operating a multi-vessel fleet with high turnover of skippers and limited training time requires a vessel control system that is intuitive and easy to master. blue ARROW provides the best mix of both, making it the ideal system for military and quasi-military patrol fleets.



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