

FPB 115– Offshore Motor Vessel - Preliminary Specifications
(subject to change without notice)

September 15, 2011 V 6.4

Dimensions and Capacities

LOD	115.4' / 35.2m
LWL	111.5' / 34m
Beam Deck	21' / 6.44m
Extreme Beam (edge of rub rails)	22.1 / 6.8m
Draft-half load	5' / 1.5m
Displacement Full Load	185,000 lbs /84,000 kg
Air Draft (top of masts-excluding whips)	36.5' / 11.2m
Fuel Capacity	6000 US Gallons / 22,700 L
Fresh Water Capacity	2500 US Gallons /9,400 L
Minimum Range of Positive Stability	140 degrees (half fuel in one tank, full fresh water tanks)
Cruising Speed	12 knots
Top Speed	14.0 knots (Half Load)
Approximate Range	5000 NM @ 12 knots
	Note: speeds/ranges are for smooth water, half load displacement, clean bottom
Main Engines	John Deere 6068SFM50 (265 HP at 2500 RPM) x 2
Transmission	ZF305-2 – 2.91:1 reduction
Gensets	27.5 kW 60Hz, 230VAC single phase x 2
Alternators	Electrodyne 150A, 28VDC belt driven off engine PTO with remote diodes, x 2 per engine – total of 4
Stabilizers	Oversized shafts, aluminum fins
Water makers	Sea Recovery 230V 75 GPH with auto fresh-water flush, soft-start, media filter, X 2
Fire Suppression	Fully automatic shut-down system in engine room w/ manual trigger
Ballast	An allowance for 10,000lbs/ 4500kg lead ballast shall be made.

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Structural Plan Approval & Inspection

Plan Approval:

The structure of the FPB 115 shall be in accordance with the Lloyd's Special Service Rule and receive formal approval thereon from Lloyd's.

Survey Inspection:

Aluminum structure to have Owner approved surveyor to confirm it is being built in accordance with plans and specifications.

Structural Details

Aluminum Quality Standards:

As a majority of this Yacht is to be left bare and unpainted, the hull deck and superstructure to be faired to the highest standard. Topside deflection plus or minus three mm in two meters, from underside of toe rail to top of boot stripe. Bottom plate (12mm), deck, and roof plate is plus or minus five mm in two meters.

Welding to be by certified welders to AS 1665 standards for weld allowance using 5083 H321 and 5083 H116 plate.

All aluminum plate will be supplied with Certificates outlining its conformity to 5083 H321 or 5083 H116 from recognized DNV or Lloyd's suppliers. Certificates to be matched to scaled drawings of cut files for future reference. Extrusions of 6061 T6 may only be used only above DWL.

Thru-hull penetrations are to be in 5000 series alloy, or if in 6000 series, to be hard anodized.

A series of X Rays or ultra sound tests to be made (16 total) to check weld Integrity of floors and Hull welding.

Exterior welds, frame lines and intercostals to be ground smooth and fair except underwater areas where structural requirements dictate leaving welds un-ground. Interior welds and plate edges, where exposed, to be softened to reduce cuts when working around exposed metal surfaces. The topsides to be ground to an 80 grit finish in a pattern similar to existing FPB's (64's and Wind Horse).

Tanks, belting and keel to be tested to 3m head over 48 hours using a manometer and record supplied to Purchaser.

Hull Scantlings:

Hull framing and plating is designed to no less than minimum of the Lloyds Special Service rule. 15/32" / 12mm bottom plating, 5/16" / 8mm topside plating are the minimum acceptable thicknesses.

Main Bulkheads:

There is a collision bulkhead 1 meter aft of the bow, and a watertight bulkhead at the aft end of the forepeak. There are structural bulkheads either side of the (basement) area, and another structural bulkhead approximately a meter forward of the engine room. The engine room bulkhead is watertight.

Exterior Finish Deck:

Smooth plate to be used in all deck areas, finished with Treadmaster or equal non-skid system, except for portions of the house top and the dropped deck area near the windlass that shall be ground but otherwise left bare. Two inch (50mm) waterway margins around perimeter of non-skid panels.

Bottom Paint:

Self polishing copper bottom paint system to be used with multiple Zeca barrier coats and Altex anti-fouling. Boot stripe tops off bottom paint system with overlap on Zeca barrier.

Hardware Attachment:

All deck hardware above living areas to be blind fastened.

Isolation:

All stainless steel hardware shall be isolated from aluminum with dielectric material. Bronze winch bases shall be isolated with high density rubber (40 shore). Minimum clearance of .5mm on life line stanchions so they may be removed for repair or replacement. Tef-Gel or Lanocoat like material on all fasteners into aluminum.

Ballast:

There is an allowance for up to 10,000 pounds (4500kg) of lead ballast, encapsulated within the keel.

Tanks:

Fuel and water tanks are integral with hull, forming a double bottom under all of the living area. There are a minimum of two water tanks and four fuel tanks. 900mm wide coffer dams separate fuel and fresh water tanks. There are two day tanks for diesel fuel in the engine room. Stabilizer fin mechanisms are located in their own coffer dams with hinged watertight lids. There is a single inspection port for each tank above the low point. Within the tank layout allowance will be made for port and starboard liquid trim tanks. Allowance shall be made for a grey-water tank. Allowance for a heat exchanger tank for fridge/freezer compressor cooling shall be made.

Attachment Points on Deck and House:

12mm threaded inserts to be used with eyebolts for securing the following equipment is provided: two dinghies aft, two life rafts.

12 threaded inserts are provided on house roof (6 per side) for later use with storage or awnings. Tie down points for second bow anchor on foredeck. Socket for ship's

ensign on stern area (supply aluminum yacht ensign pole). Additional 24 inserts on deck for tie down and future use. Allowance will be made for two sets of dinghy chocks. Boom guy control blocks (fore and aft) on both sides, bridle off stern (2).

Antennae Bases:

Six one inch threaded pipes are welded to pilot house top, and bases for six vertical antennae are provided on mast spreaders, and four on the mast hoops. Platforms for two radars and one for a 66cm diameter satellite dome on the upper mast platform.

Hull Insulation:

In the living area topside plating, deck, and tank tops are insulated with ½"/12.6mm thick Armaflex closed cell foam. Frames and Longitudinals are insulated with ¼"/6mm material. The engine room bulkhead is insulated with 2"/50mm Armaflex for sound control. The rest of the engine room is insulated with 1"/25m Armaflex. Deck, frames, and hull longitudinals in engine room are not insulated. Insulation to come within 50mm of tank tops or tank margin plates. Tank tops in central systems area are not insulated.

Zinc System:

Zincs to be fitted to the hull at quarter points and alongside rudders near props. Fabricate custom Camp style propeller nuts with zinc on nut to protect props.

Prop and Rudder Shaft Alignment:

Machine bearing carriers and imbed into structural aluminum tubes with "Chock-Fast".

Weed Deflectors:

Weld triangular shaped plate weed deflectors ahead and behind (fore and aft) of rudders and stabilizers.

Hull Marking:

Provide weld mark 300mm above DWL on transom, at bow, and each side of hull at station 5. Reference marks provided at leading and trailing edges of stabilizer foils, a consistent distance from the hull centerline, and for the trailing edge of the rudders on center.

Official Number:

Using black vinyl numbers as a guide, partially drill (dimple) a forepeak girder surface with the vessel's official number (if provided during construction by the Purchaser).

Towing Bit:

Towing bit in bow area shall be installed.

Miscellaneous Structural Details:

Ladder to swim step from deck is built into the transom. Thruster pipe in forepeak. Storage area of central systems area has slotted angles on tank tops for tie down. Brackets for specified gear as required, throughout boat. Two sealed areas, one for the storage of flammables and the other for use as a general lazarette are inboard of the forward edge of the swim-step.

Hull Windows:

There shall be fixed hull windows, four on the starboard side and four on the port side. Details of construction to be similar to FPB 83.

House Windows:

Lower house windows are to be solid, toughened safety glass, equal to Lloyds SSC rule requirements, but not less than 19mm. Interior surface of windows to be coated

with a non-metallic ultraviolet A and B and partial infrared screening film. Pilot house windows to be equal to Lloyds requirements.

Entry Doors:

Freeman Marine style welded aluminum weather tight door, fabricated by Circa Marine, between salon and deck. Second watertight door between the pilot house and pilot house deck.

Deck Hatches:

There is a custom hatch over the forepeak for use with large items stored forward in addition to the cast aluminum Bomar 160 over the forepeak.

Owner's suite has two Bomar 160s, and smaller Bomar hatches over bath and toilet compartments.

There are two additional Bomar 160s over salon, one over pilot house, and two into engine room.

Stainless Steel Work

General Notes:

All stainless steel work to be 316L, polished, and fabricated to the highest standards.

Interior Overhead Handrails:

Overhead hand rail for securely moving about in a sea way in accordance with the approach on the FPB 64s and FPB 83.

Interior Companionway Rails:

Companionway rails at each stair system.

Head Hand and Towel Rails:

Hand rails near each toilet for support and use with drying towels.

Life Line System:

Life line stanchions are 40"/1025mm above deck level, 2"/50mm heavy wall tubing, with four rows of life lines. Wire is attached to flat plate weldments at each stanchion, leaving center free for telescoping awning support pipe. Telescoping pipe to have positioning system, such as "fast pins", with an awning attachment bale on top.

Lifelines are uncoated 316 stainless steel 1 x 19 wire, 6mm diameter for the upper wire and 4mm for the lower wires. Lifeline wire ends utilize machine swaged terminals

A split pulpit is forward. Special pushpits are aft.

Near aft end of cabin house are boarding gates port and starboard, with stanchions having added support for loading when gates are open.

Four gate lifelines, utilizing pelican hooks forward, with machine swaged fork terminals at aft end.

Upper Deck Rails:

Surround fly bridge and pilot house aft deck with double rail.

Miscellaneous Stainless:

Hinged swim step ladder. Ladder to pilot house aft deck, stairway to flying bridge from pilot house level.

Engine Room

Engines:

Two John Deere 6068SFM50 (265HP at 2500 RPM) diesels are fitted and painted with a high quality linear polyurethane paint system. Engine fitted with Racor air intake/noise suppressors, and Racor "Crank Vent" closed crankcase system.

Drive Line:

ZF305-2 gear box, with 2.91:1 reduction ratio, connected to a 2.5" Aquamet or equal prop shaft. A P.S.S. dripless shaft seal and line cutter are fitted to each shaft.

Props:

32" diameter, four blade nibral bronze props. Spare props are stored on spindles in forepeak .

Engine Controls:

Mathers electronic shift/throttle installed in pilothouse, flying bridge, and forward end of great room. Allowance shall be made for a Mathers or similar maneuvering joystick system controlling engines, thruster, and rudder.

Fuel System:

Two day tanks in engine room, fed by either of two one-half horsepower 230VAC geared Oberdorfer fuel pumps. Pumps draw through dual Racor 1000 filters selecting from any of the central or day tanks. Connect to day tanks with 1" rigid pipe with an accessible valve at each tank. Insure that the run between tanks is flat, with no dips or rises. Fuel system can be used to "polish" fuel, or transfer it between tanks for trim control. Dual Racor 1000 filters with are supplied for engines with

another filter set plumbed to each gensets and single for the diesel heater. Each filter stage has a vacuum gauge. Main fuel tanks are filled via a pair of 2" deck fills. A one piece, rigid pipe, air vent runs under shear from main tanks and empties into day tank. Day tank air vents with shut off valves exhausts in inverted J into flammable swim-step locker. Stainless fittings with USCG Type A fuel hose throughout. Each diesel engine shall have its own independent fuel return line. A fuel magnet is fitted in the fuel polishing system. Remote fuel shut off to cut day tank supply to filters operable from outside engine room.

Alfa Laval MIB 303 (or similar) centrifuge shall be installed.

Dip sticks supplied for main fuel tanks. Along with Tank Tender system.

Exhaust System Engine:

Dry exhaust risers (mild steel) to deck supported off engine mounts and wrapped in insulation. Inconel injection elbows and wet exhaust from deck to transom. Muffler hung from injection elbow (drain in lowest point of muffler). External flapper on exhaust. Shut off valve on exhausts.

Consideration shall be given to an underwater exhaust system.

Exhaust System Gensets:

Exhaust system with water exhaust separator and shut off valve.

Exhaust System Notes:

Maximum effort made to isolate exhaust system from structure to minimize structure born noise. Main engine mufflers to be hung from deck with soft fixings. Exhaust riser to be supported off engine mounting system.

Lube Oil Changing Pump:

A lube oil changing pump system (230VAC) is connected to engines, transmissions, and gensets with remote hose to allow old oil to be pumped out, and new in.

Additional Engine Instrumentation:

Engines have Murphy Switch Gauges mounted for engine oil pressure, engine coolant temperature, transmission oil pressure, with sight glass and alarm systems for engine oil level and engine coolant level. Raw water supply and exhaust hose temperature alarms are also fitted. Note, these are in addition to the standard gauges/alarm system fitted by John Deere.

Engine Room Air Intake/Exhaust:

Engine room air intake to incorporate Seaforth water shedding grill with dorade style upstand to prevent water intrusion, and a closeable heavy weather dampener/fire suppression plate. Penetration into engine room to be sufficient so that the bottom is 600mm above inverted water line in full load trim. Exhaust fan located near centerline in transom.

Engine Room Fire Control:

A fully automatic fire suppression system, with manual trigger, is installed in the engine room. There is also an automatic shut down system for engines, gensets, and diesel heater. Four heat alarm sensors fitted to the overhead of the engine room.

Engine Room Miscellaneous:

Provision is made for lifting engines and gensets for in-situ maintenance.

Window for observing engine room in the water tight door.

There is a work bench, with sink, vise, and with tool drawers for storage below.

Engine Room Annex:

There is an engineer's desk, as well as electrical and generator controls located in the annex area adjacent to and forward of the engine room bulkhead. The forward bulkhead of the engine room annex will be constructed as a noise barrier. This will use the same noise dampening plywood with Sylomer core, as is used for the engine room bulkhead.

Plumbing

Sea Water Plumbing Systems Engine Room:

Sea water is supplied via a sea chest. Access to shut off valves and strainers to be given priority in engine room layout. Provide four additional ¾" take-offs on manifold for future use (plugged now).

Salt Water Wash Down:

Pressure sea water pumps in forepeak and engine room for fore and aft wash down.

Fresh Water System:

Integral hull tanks, with topside fills. Output of water maker can go to integral hull tanks or 25 gallon (USG) drinking tank. The drinking tank has a spigot at the galley sink, fed by its own pump, and is fitted with a carbon filter and UV sterilizer. This is the primary supply for onboard drinking water.

The main pressurized system, with shut off valves at each faucet, mixer valve, and washing machine, includes four spigots (forepeak, aft end of house, pilot house deck, and lazarette) in addition to a hose bib in the engine room. An anti-scald device is fitted on the hot water tanks (calorifier), and constant temperature mixer valve in each shower/bath.

Swim-step to have mixer valve with shower fitting.

Hot water system has a return loop with check valves and a 230VAC circulating pump, which runs on a timer circuit. Both hot and cold water lines are insulated.

Two Headhunter Mach-5 230VAC pressure pumps with accumulator, are installed to supply water to all decks. Each pump is independently capable of pressurizing and handling demand. Valves allow for quick switch between pumps as needed. Aft fresh water tank fills on port and starboard sides. Forward fresh water tank has single fill located in forepeak.

Domestic Water Heaters:

Two 20 gallon/75 liter domestic water heater (calorifier) with dual 2000 watt heating elements and dual heat exchangers fitted in the engine room.

One 60 gallon/225 liter domestic water heater (calorifier) located in basement.

Damage Control Pumping System:

A bronze, self-priming, MP Flomax 15 Hydraulic damage control pump draws from the forepeak, each of the living areas, and engine room (315 USG/1192 LP/M) and is operated manually or under control of high water alarm (reed) float switches in each watertight compartment. Single 3"/75mm suction line to each valve and pick up point, except engine room which is 2"/50mm.

Bilge Pumping Systems:

Bosworth GE-2604A 24VDC (1/2hp) bronze diaphragm pumps, fitted with oversized strainers on intake line, as follows: two pumps in engine room each with its own control circuit; one in central systems area with hose which is hard plumed to the stabilizer coffer dams and the systems space, one in the forward cabin space, one in aft sleeping areas; and one forepeak (total of six pumps). Reed style float switches, triggering control relays, are used to operate the bilge pumps. Manual override and indicators (on Maretron system) at the pilot house and great room for each pump

High water alarm reed switches in engine room, each interior section, and forepeak. Additional float alarm reed switches are in stabilizer cofferdams.

Gray Water:

Gray water system comprised of an integral hull tank, with Whale Gulper sump pumps between showers, sinks, and holding tank. Three level reed switch indicator of tank level, with 4th reed switch for high alarm. Sealand discharge pump to discharge overboard.

Black Water System:

Planus heads (toilets) provided for, fed with fresh water from domestic pressure water system. Toilets to be valved for overboard discharge or into the Headhunter compact sewage treatment system (model TW-HMX-6001P).

Solid PVC pipe is used for as much of toilet discharge plumbing run as possible. Where soft hose is required, Sea Land Premium heavy duty hose is used. All installed to avoid trapping effluent.

Tank Level Indicator:

Heart Tank Tender is plumbed to the diesel tanks and fresh water tanks. Day tanks have protected sight gauges with shut off valves top and bottom. Calibrate tank tender with accurate fill, leaving ten minutes between each level before resuming filling. Day tanks to be measured by adding fuel in 40 liter increments from a container which has been carefully measured.

Fire Fighting Pump:

An AMT 4.7HP, Yanmar diesel driven, stand-by fire fighting pump shall be installed. Supplied with 100' (30m) of 1.5" (37mm) double jacket attack hose and adjustable nozzle.

Heating, Air Conditioning, and Refrigeration

Heating:

Heating of interior and domestic water is provided by a Kabola 95,000 BTU Diesel boiler. Highest quality heater hose to be used throughout. MSR style heater fan units, individually thermostatically controlled in all sleeping cabins, engine room annex, pilot house, and great room.

Heater fitted with Kabola muffler with insulated stainless pipe exhaust.

Summer loop to allow for system to heat domestic water only.

Air Conditioning:

Air conditioning is via a multi-compressor (Scroll style), modular chilled water system, with soft-start, 160,000 BTU reverse cycle capacity. Each cabin and general living space, shall thermostatic temperature control over its specific area.

Consideration will be given to using the aft fresh water tank for condenser cooling.

For fresh air make-up in aft, lower deck cabins, there shall be provision for forced air ventilation providing 4 air changes /hr. The air intakes shall be as high as possible on the inside house coaming, forward end of the main aft deck. A Seaforth water-shedding grille shall be incorporated and a hinged closure plate for use in heavy weather shall be fitted. Ducting shall avoid penetration of engine room space.

Refrigeration:

Galley fridge of approximately 12.3 cubic feet / 348L, with side-loading doors Galley level freezer, approximately 8.5 cubic feet / 240L, side loading. Located in central systems area or pantry space, are additional fridge/freezer units of approximately 33 cubic feet / 950L. Each galley box has its own Danfoss K50 compressor and evaporator plate, and can be individually controlled as to temperature. Extra storage

boxes will require multiple compressors. Condenser cooling is with "keel coolers" mounted in coffer dam tank.

Insulation for Galley and Extra Capacity is isocyanurate foam, with two layers exterior Mylar film wrap moisture barrier. Refrigeration will have four inches /100mm insulation on sides and bottom, three inches on top, and Freezer to have six inches /150mm on sides and bottom with four inches on top. There are four inches/100mm of foam dividing fridge and freezer.

Interior of fridge and freezer boxes are lined in stainless steel.

The galley refrigeration is separated into two areas, one having standard shelving, the other consisting of pull-out drawers to facilitate storage and retrieval of common goods.

Pilot house to have Vertifrigo 24VDC 4.2 cubic feet / 118 cubic liter under-counter evaporator-type refrigeration with stainless steel door, with small freezer space, air cooled.

Beverage Refrigerator Drawers – Vertifrigo 24VDC 5 cubic feet / 141 cubic liter under-counter drawers (2), evaporator-type unit with stainless steel front.

Ice Maker – under-counter Vertifrigo 0.8 cubic feet / 22.6 cubic liter, 22lbs per 24hr production AC unit.

Electrical System

General:

The installation shall comply with the latest issues of relevant requirements of the statutory bodies and New Zealand Marine Safety Maritime Rules to best trade practice and be carried out by suitably qualified trades people.

Installation:

Cables will be installed on suitable trays or in ducts and conduits and secured in place to prevent movement and chaffing. Where cables penetrate watertight bulkheads suitable sealed penetrations will be fitted to maintain the integrity of the bulkhead.

All cables will be identified at both ends with appropriate cable markers aligning with the cable schedules and schematic drawings.

Mechanical Isolation and Bonding:

Isolate mechanically, all electrical equipment where practical (exceptions to be made for windlass, electric winches, engines and gensets). Care shall be taken to ensure all electrical equipment is electrically earthed or bonded to avoid any possibility of shock or hazard.

RF Isolation:

Isolate electrically all RF grounds from hull using appropriate capacitors as needed.

Documentation:

After satisfactory testing and commissioning, the vessel will be supplied with as built documentation/records for the electrical installation. Documentation will include systems descriptions, drawings, cable schedules and test records, a list of all fuse

sizes and locations, and a list of all solenoids/relays, circuit boards, and their locations.

Fuses and Solenoid/Relay Spares:

Small Amperage fuses – QTY 25 of each size and type used.

High Amperage fuses – QTY 10 of each size and type used.

Solenoids – QTY 4 of each size and type

Relays – QTY 4 of each size and type used.

(Integral machinery solenoids and relays addressed in Spare Parts, below)

Basic Wiring:

Marine grade, tinned wiring to be used throughout. The following items are to be sized for a three percent voltage drop: fridge compressors, autopilots, RADAR, SSB/Ham transceiver, water makers, and all bilge pumps. The following items are to be sized for a five-percent voltage drop: alternators and genset output, inverters, power winches and windlass. All other circuits to be sized for 10% voltage drop.

Terminations:

All wiring terminations below waterline, and all otherwise possible, to be done using adhesive heat shrink terminals. All terminations to be done with proper lug, ring, or captive spade terminals, with nylon sleeves, except on cable lugs. All larger size terminals and cable lugs to have heavy-duty adhesive heat shrink (#4 through 4/0 wire). Those positive terminations otherwise unprotected, to be protected with insulating boots or covers.

Extra Wires – Messenger Lines:

Provided are the following extra wires from panels (AC or DC), to specific regions of the vessel for future use by owner/technicians:

To engine room, 2 X 14/2(DC), 2 X 12/2(DC), 2 X 12/3(AC),

To forepeak, 2 X 14/2(DC), 2 X 12/2(DC), 2 x 12/3 (AC)

To pilot house, 2 X 14/2(DC), 2 X 12/2(DC), 2 X 12/3(AC)

To flying bridge area, 1 X 14/2(DC), 1 X 12/2(DC)

To mast, 2 X 75ohm coax TV antenna cable (to entertainment console), 1 X 12/2(DC), 1 X 14/2, 1 X RG8X, 1 X RG213

If vessel is delivered with additional owner electronics systems installed, install of gear may change final additional "Extra wires" included.

Included are pull strings in conduit or difficult areas for future use, including, but not exclusive to: general fore and aft and athwart ship runs, mast, cabin top (mullions).

Heavy Duty Fusing:

High capacity ANL type fuses are installed on the output side of alternator rectifier assembly, and at the leads coming off of the batteries. The inverters will be fused utilizing Class T fuse and fuse holder.

Panels:

Primary circuit breaker panels to be located in engineering annex. The AC panel to have digital meters identifying independently - AC line voltage, amps, and frequency. Circuit breakers and monitoring of AC will be at annex panel, including: Incoming shore power, Inverters, and Gensets to manage loads. AC digital meters will also display incoming Inverter power feeding panel.

The primary 24VDC panel is fitted with separate digital voltage and current meters. Panel has digital amp meters to display each of the alternators outputs, as well as a digital multi-meter to show DC volts, amps, and amp hours, of house bank and each starter bank.

Breakers:

Single throw, double pole breakers for all service circuits for disconnect of positive and negative legs of the circuit on the DC side and LINE and NEUTRAL on the AC side (115VAC and 230VAC).

24 V DC House Battery Bank:

The House battery bank shall be Hoppecke 24 OPzV 3000 (3000Ah C10 discharge rate) 24V DC tubular plate traction batteries, of sealed gel type construction. This bank supplies all ship's needs, except for the normal starting of the main engines and generators.

Engine and Generator Starting Bank:

There shall be a starting battery for each diesel engine. Starter battery banks (4) shall each consist of one 12V, 4D, 1200CCA, maintenance free, AGM-type battery. There shall be one for each main engine, Port and Starboard, and one for each generator, Port and Starboard.

Each main engine starting battery is charged through its own 24VDC to 12VDC (13.8VDC) converter/charger, operating when the engine is running. In addition, main engine start batteries will be capable of being charged via a 12V, 60A, 230VAC 2-bank, smart charger.

For the generator starting batteries, charging is achieved from 12VDC alternators on gensets. In addition, batteries will be capable of being charged via a 12V, 60A, 230VAC 2-bank, smart charger.

24V DC Battery Bank Charging:

Main House batteries are capable of being charged underway by four 150 amp (600A total) Electrodyne alternators (two mounted on each propulsion engine) with remotely mounted and fan cooled rectifier assemblies. Alternator output to be temperature and voltage compensated. Utilizing generator power or sufficient shore power, three (3) 230VAC Victron Energy Multi-Plus (24/5000/120) units are available to provide charging, rated at 100 amps each, 300 amps of total, with smart regulation, as well as temperature and voltage compensation. Multi-Plus units can be controlled and monitored at remotes located in Engineering annex.

Battery Switches:

Battery disconnect switches (isolators) are installed near batteries, on positive leads of each primary/major circuit with remote switching at Engineering Annex. These include; Main 24VDC distribution panel, 230V Inverter/Chargers, 115V Inverter/Chargers, Electric Deck winches, Electrodyne Alternators Port Engine, Electrodyne Alternators Starboard Engine. There is one single point where DC ground is connected to the hull.

12 V DC:

Continuous 12VDC for onboard non-starting 12VDC circuits, is provided from a pair of 24-12V converters, providing 60 amp capacity, or (in emergency) a center tap on the 24V bank. 12V cigarette lighter style plugs are provided in the bridge area (four), at the engineering annex (two), and at the flybridge (one).

Primary AC Power:

Vessels primary AC circuit is 230V, single phase, 60Hz (2C+E). This is supplied from either Shore power, one of two identical 27.5kW 60 Hz gensets, or from three (3) stacked Victron Energy 5000kVA MultiPlus inverters (15000kVA total). The inverters are capable of synchronizing with generator or shore throughput to provide power assist if loads surge beyond incoming capacity.

An emergency by-pass switch will allow by-pass of the Victron Energy Multi-Plus units for redundancy.

Secondary AC Power:

A separate stand-alone secondary 115VAC 60Hz inverter system will power onboard 115VAC loads. This system is powered from the 24VDC House battery bank. 115V loads consist of AC outlets for domestic use, shipboard computer, and other onboard 115V gear. This system to be comprised of two Victron Energy 5000kVA units (10,000kVA total).

A 6kVA step-down transformer will be able to provide emergency back-up 115V power from the shipboard 230V system.

Alternately, a 230V, 50Hz secondary AC system can be installed in lieu of the above 115VAC system.

All wiring on secondary AC system to be executed to accommodate lowest potential voltage (115V) to ensure ease of conversion for future ownership needs.

Domestic AC Outlets:

40 GFI plug circuits for small domestic appliances are located throughout the vessel and are 115V AC or 230 VAC.

AC Power Supply for Bridge Monitors:

The main Bridge monitors have their own independent, 750 Watt, pure-sine, AC inverter. There is additionally an AC power point fed from vessels primary AC inverters at the monitor plug point for quick changeover of power source, should 750 Watt inverter fail.

Shore Power:

Vessel is equipped for incoming shore power of 208-240VAC, Single Phase, 50 or 60 Hz. A 24kVA isolation transformer is fitted to the vessels Primary AC system of 208-240V, Single Phase, 2C+Earth, power.

Shore power inlets (230V) to be located aft near transom, and another located in forepeak. Aft cord to incorporate a 100 ft., 100A, cord set on a Cord Reel system. Forward system to have inlet and loose 50 ft. cord-set. A manual switch will select Fore or Aft AC shore service.

Install after the isolation transformer, an AC SOURCE manual switchbox, where selection of desired AC source can be selected: Either, SHORE FWD, SHORE AFT, GENSET 1, or GENSET 2.

Shore Power Cordsets:

In addition to the 100A cord-set on the installed cord reel, the following are included to provide for typical shore power connections.

A 230V "Smart-Y" adapter will be included to allow for 100A service to be provided from two 50A shore outlets.

A single 25 ft, 125/250V, 50A shore cord will be provided.

In addition, an 82 ft/25 meter 63A (16mm² 2C+E), Euro (and Oceania) style cord set is included to allow for limited use when less than 100A service is available.

An adapter cable to allow 63A to 100A. Allows use of 63A cordset with accompanying current limitation.

An adapter cable to allow 50A to 100A. Allows for use of 50A cordset with accompanying current limitation.

Gensets:

Generators to be two (2) identical 27.5kW, 60Hz generators, with output wired for 230V, Single Phase – 2C+Earth. Remote control and monitoring from Engineering Annex, with onboard start/stop controls at generator.

Gensets are double isolated from structure to minimize noise and vibration.

Central Systems Area Fire Suppression System:

The central systems area – housing the ships batteries, Inverter/ Chargers, and Domestic pumps, shall be fitted with a Fireboy HFC-227ea clean agent automatic fire extinguishing system. A manual discharge with operation outside of space is fitted.

Security Alarm:

Security system connected to 10 deck sensors and reed switch on entry doors. Alarm triggers external horn and deck lights, and is turned on with remote control (4 remotes supplied).

Horn:

A Kahlenberg D1, chrome dual trumpet horn to be fitted to forward mast. System to have fog timer, DC solenoid control, and will run off vessels central air compressor system.

Air Compressor:

An 8 gal/ 30L, 230V electric motor driven compressor to be fitted in forepeak. A service line will provide up to 125 psi max pressure to quick-release air fittings located in forepeak (1), central systems area (1), and engine room (1). A 25ft/7m service hose with quick fittings provided at each location. A tee off of system forward will supply air to vessels horn.

Fuel System controls:

Each day tank system is fitted with series of magnetic reed switches to indicate fuel level in the day tank and control tank(s) level. Bottom (20%) reed switch indicates low, ¼ capacity triggers latching relay to turn on system, half capacity switch turns off latching relay, 90% level turns off latching relay, and 95% level is alarm. Latching relay can be engaged with manual trigger at bridge. Manual control (direct to solenoid control) at engine room panel. Also on engine panel is selector switch to choose one of the two transfer pumps. Each fuel transfer pump has its own circuit breaker and solenoid (one latching relay controls both solenoids) Three additional reed switches are in the circuit to allow adjustment of day tank levels as requirements change. Bring reed switch wiring to terminal boards to allow for easy modification.

Electrolysis Monitor:

Vessel will have Ag/AgCl half reference cell connected to digital voltage meter with spring return (momentary) switch for operation, to monitor correct operation of sacrificial zincs.

Critical Systems Monitoring Panel:

In addition to the OEM information provided on manufactures control panels (main engines, and gensets), a Critical Systems Monitoring Panel will be installed at the pilot house main helm. This will provide status on engine room systems including: Murphy gauges, bilge pumps, bilge alarms, fuel transfer pumps, fire and heat alarms, and raw water flow.

Remote Controls at Pilot House and Great Room:

Remote switching/control of bow floodlight, foredeck light, aft deck light, manual trigger of day tank latching relay to start fuel transfer pump, deck winch, horn, standard bilge pumps (4), damage control pump with selector switch, and windlass control with chain monitor.

Remote Controls at Flying Bridge:

Remote controls for aft deck lights, anchor area light, bow floodlight, deck winch, horn, windlass control with chain monitor.

Interior Lighting:

There are eight large fluorescent fixtures in the engine room, 8 in the basement. 8 large fluorescent overhead lights in forepeak.

Allowance has been made for the installation of following light fixtures, with layout and lighting similar in style to Wind Horse. Each lower deck sleeping position to have bulkhead mounted reading lights, four "stalk" lights at helm positions, desk lights at each work station or desk, and 150 overhead spot lights throughout all living cabins, in the headliner. Headliner spotlights are on dimmer circuits.

Exterior Lighting:

Two Aft deck flood lights on mast, On foremast, one forward flood light for windlass area and one aft, LED lights for fly bridge, LED Lights for swim step area, LED anchor lights are provided on the main as well as at the forward mast. An Aqua Signal 230VAC, 1000Watt Quartz Floodlight to be mounted on the aft mast – to illuminate the aft deck when significant light for working is needed.

A 200 Watt Xenon (15 Million Candlepower) remote controlled searchlight to be mounted on forward mast with remote panel control at main helm and flying bridge.

Running Lights:

Side running lights are installed at the level of mast main radar platform for best visibility. There is a steaming light, bow (range) light, and stern light.

Electronics

Navigation:

Pilothouse furniture is built to allow fit out of marine electronics. Cabinetry supplied.

Other areas to allow for at least navigation electronics include flying bridge and the great room inside helm.

Steering - Autopilot:

The boat comes equipped with two, completely redundant, Autopilot systems utilizing continuous running pump-sets. The vessel is designed to be helmed via "fly-by-wire" control and has follow-up levers at each station to allow full control of rudders. As a back-up, a manual helm pump can be employed, utilizing a steering wheel at the main helm. This manual back-up is installed on primary autopilot hydraulic system with the wheel located in the pilot house. Each helm station will have full autopilot and rudder control.

A GPS compass will be installed to provide heading information to the active autopilot. In addition, each autopilot system will have its own gyro rate compensated compass fitted.

Communication:

Consideration will be given to allow for the proper mounting and installation of high-seas satellite gear. The main mast is designed to accommodate an antenna up to 90cm in diameter and 100cm in height.

Allowance to be made to allow for fitting of a marine SSB/HF system.

Vessel Monitoring:

A Maretron NMEA 2000 system will be installed on the vessel as its primary ship-wide monitoring (alerts and alarms) system of specific onboard status and gear.

This system is to include the following:

Safety – Bilge pumps, bilge level, Crash pump, smoke and heat detectors, CO2 detectors, watertight and entry doors.

Navigation – Speed through water, Depth, Wind, Barometric,

Domestic - Bilge pumps, domestic water pumps, AC information, DC information,

Main Engines - raw water flow, coolant, oil level, oil pressure, temp, gear pressure.

Generators – raw water flow, coolant, oil level, oil pressure, temp.

This system will also provide basic depth, speed, wind, environment, and heading information.

Information will be displayed on Maretron DSM800 and DSM250 LCD displays located at the main helm (1 DSM800), flybridge (1 DSM250), main deck level (1 DSM800), engineers annex (1 DSM800), engine room (1 DSM250), and forepeak (1 DSM250).

Maretron NMEA 2000 system to be installed as a divided network, with 3 sections, each having IPG's (Internet Protocol Gateway's) to allow each section to function independently should there be the unlikely failure in one or more of the 3 sections.

Appliances

Washer/Drier:

Asko or Bosch front-loading washer and front-loading drier (230 VAC).

Dishwasher:

Asko or Bosch full-size built under-counter, in galley.

Cook top/hob:

Electrolux or GE four burner induction cook top to be fit into aft galley counter with sea rails for pots and kettles.

Oven:

Electrolux or GE speed oven with convection, broil, and microwave technology for fast and efficient meal preparation.

Central Vacuum System:

Electrolux central vacuum system is located in the basement, with pick up points in aft accommodation hallway on lower deck, entry foyer, great room and forward suite. A ShopVac (wet/dry) will be provided for engine room.

Trash Compactor:

Broan 15" built-in under-counter, in galley (230VAC).

BBQ:

GalleyMate propane BBQ on main deck.

Vessel Handling Systems

Bow Thruster:

Vessel will be fitted with a proportional control hydraulic bow thruster in forepeak, 500 pound/26kg of rated thrust. Controls will be located at each helm station. System will operate using PTO's on Generators (2).

Stabilization:

NAIAD series 500 active stabilizer actuators or equivalent, with Datum/Digital Control located in pilot house and great room. Fins to be aluminum or steel. Hydraulic pumps for stabilizers mounted on transmission B-pad PTOs. High quality hydraulic hose with stainless steel fittings to be used. Hydraulic system cooling via integral hull tank.

Steering:

Two rudders with drag link between their tillers, independent hydraulic cylinders by Kobelt. Teleflex manual helm pump with wheel in pilot house area. Manual helm pump installed so that shaft does not project aft of navigation desk. An emergency tiller is supplied with relieving tackles for securing the rudders when hove to behind a Para anchor.

Interior

Standards:

Cabinetry will have tight joints with quality equal to Wind Horse. Care will be taken to match solid timber and veneers.

Sole panels construction and finish to be as per Wind Horse.

Solid timber and veneer will be finished using a two-component paint system similar to the Ameron products noted hereafter. Sealer, wipe stain, sufficient coats of Amerbuild 495 A & B to achieve full grain fill, and then finish coats of semi-gloss Ameron 574A & B.

All timber and plywood surfaces not mentioned above (such as cleats, hull and headlining grounds and panels, and bulkheads) will be sealed using epoxy or Everdur.

Interior components will be securely fastened. Structure to allow for 2G acceleration.

Head lining, hull lining, and bulkhead panels will be neatly fitted and securely fastened using FAST-MOUNTS.

Interior Bulkheads:

Engine room bulkhead to be done as in FPB 64-5. This includes Armaflex coated aluminum on the engine room side, Sylomer vibration isolator, timber grounds, and then Subdue 909 sound deadening plywood, 22mm thick.

The engine room annex forward bulkhead is fabricated from then Subdue 909 sound deadening plywood, 22mm.

Other bulkheads are marine plywood as required.

Furniture Style:

Allowance shall be made for raised panel cabinet doors, in Wind Horse style. Counter tops are in high-density acrylic (Hi-Mac) in work areas. Timber fiddles where appropriate on high-density acrylic surfaces and on lockers and cabinets. Hull side shelves are in HPL to blend with hull side panels. Hatch coamings, valances (pelmet) are in timber.

Finish Schedule:

Interior bulkhead doors are painted moderate gloss LPU, to match wall coverings.

Shower/head modules are medium gloss finish fiberglass sandwich construction.

Timber is gloss finish.

Head Liner, Bulkhead, and Hull Liner System:

Headliner system consists of separate panels, held in place with proprietary hardware. Hull liners are held in place using combination of special clips and Velcro, and are covered with foam and then fabric. Bulkheads in striated texture backed vinyl wall covering.

Berth Cushions:

Eight inch/200mm forward bunk cushion constructed of high quality "Memory" or natural Latex foam, six inch/150mm. Aft bunk cushions of similar construction to forward bunk.

Seat Cushions:

Seat cushion quality to be to Wind Horse specifications. Salon seating bases and backs held in place with Velcro, overhanging style, with plywood backs for shape control.

Slip Covers:

Provide lose fitting vinyl slipcovers for salon bottom and back cushions, helm chair, and padded cover for salon table.

Floor Runners:

Provide protection for carpet in the form of light vinyl floor runners.

Fabrics:

Head liner and Hull liner to be in UltraLeather, similar to Wind Horse.

Bulkhead coverings to be in striated vinyl similar to Wind Horse.

Salon seating – Ultra suede

Bunk cushions (interior) – textured vinyl.

Flybridge cushions - Bottomsiders

Window Coverings:

3/8" (9.5mm) Honeycomb cordless blinds to be fitted to salon windows.

Interior Safety Belts:

Seat belt pairs fitted to bunks. Lap belts at each flying bridge helm chair and at four seated positions. In great room provide lap belts at banquette (4), salon (4) and miscellaneous (2).

Helm Chairs:

Helm chairs by Crown.

Miscellaneous

Ground Tackle System:

Maxwell VWC4000 windlass (hydraulic), chain stop, chain counter, with remote control at forepeak. Chain counter remote control (3) at flying bridge, Pilot House, and lower helm. Chain is ACCO schedule seven 1/2"/12.6mm, 350'/107m long, with oversized links on each end. Two additional 25'/7.7m sections with oversized links are included. Anchors are: 400lbs/181kg Rocna/Manson Supreme style (primary/self launching) and two Fortress F125. Two 400'/122m of 5/8" /15.8mm high modulus ropes are provided for emergency rodes.

Deck Hardware:

Six Lewmar electric, self-tailing, #68 Ocean aluminum winches are installed (two aft, two forward, two amidships) for handling dock lines and lifting dinghies.

Two Lewmar #40 self-tailing aluminum winches are installed for boom control. Harken Raidal Rewind #46 (9/16"/14mm line) dual-direction electric winch for dinghy launch and retrieval.

Rope clutches for boom control lines (4), and dink lifting halyards (2), and back up at anchor roll control (2) are fitted.

There are cleats each side as follows: mounted on the rub rail at the bow, two amidships for springs, just forward of the pushpit aft, and on deck all the way aft. Cleats to allow for high docks in areas with large tidal ranges.

Dock Lines:

Dock lines made up from 1.25"/30mm Yale Portland braid polyester and 1/2"/12.6mm Yale Maxi braid plus, high modulus dual braid. Of polyester there are four lines of 60'/18m each, and two lines of 100'/30m each. Of high modulus there are four lines of 80'/18m each and four lines of 100'/24m. One 160' (49m) high modulus.

Running Rigging:

Dual braid polyester in 1/2"/12.6mm is supplied for boom afterguys, boom foreguys, dinghy halyards, and flopper stopper pennants off boom ends.

Bulk Rope:

Bulk material for tie downs, awnings, etc is supplied as follows: Dual Braid polyester 1/4" (6mm) - 1000 (180m), and 3/16" (4.5mm) - 1000' (300m).

Shore Fast Lines:

4 X 200m 12mm Yale Vectrus uncovered high modulus with stainless steel reels that have allowance on deck for mounting and are stowable in forepeak when not in use.

Rig:

Dual masts (eight inch/200mm schedule 80 alu. pipe) are mounted at the aft end of the house. Each are fitted with 24'/7.2m long aluminum booms (6"/150mm schedule 40 pipe), set up for lifting dinghies and for use at anchor with supplied flopper stoppers. Booms are topped up with a permanent 1/2"/12mm 1 x 19 SS stay. Fore and after guys for controlling booms, and required blocks are supplied, as are lifting halyards. Masts include spreaders for attachment of the aft end of a fly bridge awning. Overhead awning structure has grab rail and LED lighting.

Forward and aft masts have masthead bows for use with Yacht Club burgee and Owner's personal signal.

Get Home Sail:

A get home sail similar in concept to the FPB 64 shall be supplied.

Stabilization Back up at Sea and at Anchor:

For stabilization at anchor two "flopper-stoppers" are supplied.

As a back up system to active stabilizers, two "fish" of approx. 70 pounds/31kg each are supplied (stored in forepeak), with 15 ft / 4.57m lengths of chain (fusible link in system) included to rig between fish and halyard pennant.

Drogue Device:

Parachute anchor supplied. 400' of 3/4"/19mm high modulus rope is supplied for use with device (same as above under Ground Tackle). This rode is also usable for warping, and spare anchor.

A 48" Galerider shall be supplied.

Deck Hatches:

Cast aluminum deck hatches are welded to aluminum coamings, lip to catch storm covers. Hatches are glazed with 1/4" polycarbonate. Aluminum tangs welded around perimeter of forward interior and saloon / hatches for security and extra ties over storm covers.

Flying Bridge Table and Wind Protection:

Flying bridge table with folding leaves. Top and leaves from Starboard or similar polymer based product. Table has stainless handrails on two sides.

There is a stainless rail around perimeter of fly bridge 30" (750mm) high (two horizontal rails).

Forepeak:

The forepeak area is fitted with aluminum pipe integrated into the hull longitudinal stiffeners for storage fastening. Deck at windlass is dropped and drains forward. A 6"/150mm schedule 40 pipe with standard pipe flange at top, is welded to hull bottom for retractable SONAR.

A self draining anchor chain storage well is integrated into the forward part of the forepeak.

Storm Shutters:

19mm marine plywood storm shutter for each size of window, including four for great room side windows and three for pilot house side windows. Storm shutters are bolted in place using bearing channels (bolts threaded into welded inserts in house mullions). Provide two sets holes along top for carrying handles. Storm shutters are sealed with standard timber sealing system.

Awnings:

Flying bridge awning similar in construction and style to FPB 64. Foredeck awning (2), house side awnings for windows.

Canvas storm covers for each deck hatch.

In Port Trials

Port trials will be conducted to confirm proper operation of vessel and systems. A check list will be created with each electrical and mechanical item on board with an indication that it has been tested, the date, tester, and any notes pertaining to the this piece of gear. Equipment will be run for sufficient periods of time to verify correct operation.

In addition, but not limited to, the following general trials will be conducted:

Leak checks on each through hull fitting, each valve, plumbing connection, as well as all hose clamps. At the conclusion of trials each hose clamp shall again be checked.

Check operation of damage control pump by drawing from engine room and forepeak bilges, and by drawing from a bucket of water in each interior section.

Verify bilge pump operation with manual and automatic operation. Check high water alarms.

Check ability of fresh water pressure pumps to draw from an almost empty tank when not primed.

Load and unload anchor and chain the verify alignment of chain gypsy with chain stopper and anchor roller. Confirm self-launching of anchor and tight fit of anchor when winched against rollers.

Check operation of electric deck winches under working load. Test each to stall load and note amperage.

Perform required engine and genset tests to qualify this machinery for standard supplier warranties.

Verify emergency stop characteristics under way at different throttle settings.

Ensure proper operation of thruster systems.

Test various alarms to verify their operation (bilge, fire, Murphy, water flow, overheat).

Check toilets and waste management system for proper operation.

Check charging voltage regime with alternators and inverter chargers. After charging batteries fully discharge to an 80% depth. And then recharge. After full recharge, perform an equalizing charge.

Verify inverter charger operation including load sharing with generator.

On completion of the installation, all electrical equipment shall be tested and commissioned to ensure compliance with regulations, specifications and operational requirements.

Test records and commissioning reports shall be included in the electrical as fitted documentation for the vessel.

Calibrate stabilizers per manufacturer instructions.

Calibrate autopilots per manufacturer instructions.

Verify full travel of rudder and that rudder stops engage tiller arm before load is taken on ends of hydraulic cylinders.

Check all fridge and freezer operation.

Run air conditioning on heating and cooling cycles.

Operate Kabola diesel boiler for a break-in period to verify operation.

Initial Builder's Sea Trials

Conduct Builder's sea trials to verify proper functioning of systems over a period of 100 cumulative hours on each primary engine, and 50 cumulative hours on each generator.

A portion of trials shall be conducted in sufficiently adverse weather to test active stabilizers and other sea-going gear. An offshore gale with frontal passage, wind shift, and crossing sea state to be included.

At the conclusion of these trials change engine, transmission, generator, and water maker high pressure pump oil. Replace oil filters as appropriate. Have spectrographic analysis run on engine and genset lube oil.

Client Instruction

General Instruction:

During Purchasers sea trials Builder personnel will be on hand for instruction of the Purchaser in the operation of the FPB 115. Personnel will be available at no charge for the following periods:

Electrician - up to eighty hours

Engineer (mechanical systems/plumbing) – up to eighty hours

Thereafter, if additional instruction time is required it will be charged at New Zealand \$ 66. hour plus travel expenses if required.

Onboard Instruction:

Upon initial delivery, in addition to the systems and electric instruction above, ten days of on-board instruction including general boat handling both dockside and at sea will be included. Training includes extensive instruction surrounding daily systems and gear use and practices, anchoring and mooring instruction, dinghy launch and retrieval, and overall instruction on vessel use, is included.

A follow up training / question and answer visit of 3 days on-board, will also be included, timing to be determined, during the first year of ownership.

Extra Gear to be Supplied

2 Switlik six man SAR life rafts in fiberglass canister with standard locking framework bolted to deck.

6 large round fenders

2 large cylindrical fenders

4 medium round fenders

Ten 2.5 lb portable fire extinguishers

Three nine pound portable fire extinguishers

Boat hook

Life sling with canister

12 USCG approved Adult life jackets

4 USCG approved Child life jackets

Two light weight 50'/15m hoses

40 eye bolts, stainless steel, to be used with deck inserts

Ships bell

Six inch steering compass (at flying bridge house helm)

Two packages 3M oil absorbing pads (100)

Set of tool drawers to be installed under engine room workbench.

Set of tools will be supplied.

Spare Parts to be Supplied

Main Engine	QTY
CPU Module	1
Injection Pump	1
Starter Motor	1
Fresh water pump	1
salt water pump	1
Salt water pump impellers	10
Oil filters	10
Fuel filters (on engine)	12
Gasket set	1
Idler pulley	1
Spring tensioner pulley	1
Poly V Belts	6
Thermostats	4
Injectors	4
Injector tips	12
Set High pressure fuel lines	1
Set of engine sensors	1
Salt water exhaust injection elbow	1
Flexible exhaust coupling	1
Zinc sets (transmission, heat exchanger on engine)	10
Generator	
Impellers	10
Salt water pump	1
V belt	2
Oil filters	12
Fuel filter (on engine)	6
Gasket set	1
Injector	1
Set if injector tips	8
Set of high pressure fuel lines	1
Zinc sets	6
Fuel Filters (Racor 1000)	
30 Micron Filters	24
10 Micron Filters	24

Alternators	
Power head	1
rectifier assembly	1
voltage controller	1
Pumps	
Domestic Water pump	1
Wash Down pump	1
Air Conditioning pump	1
Diaphragm Bilge Pump	1
Bilge pump overhaul kit	2
Gray Water Pump	2
Water maker	
Cruise Kit	1
Primary Commercial Pre-filters	12
Oil-Water Separator filter	2
Plankton Filter Screen	2
PH Neutralizer filter	6
Charcoal filter	6
Carbon filter	6
Pump Oil	2
Storage Compound	6
Cleaning Agent for ROM	2
Media Filter replacement media	1
Electrical	
Breakers - spares of each size	5
Small fuses, of each size used	12
ANL Fuses, of each size used	6
Class T Fuses, of each sized used	4
Solenoids, of each size used	1
Relays, of each size used	2
Dimmer controls	2
Overhead light fixture	5
interior light bulbs - of each type	20
Navigation light bulbs - of each type	10
Wall sockets - power points	6
Various spare wire and cable	1
Selection of terminal fittings for wire and cable	1

Plumbing	
Assortment of pressure fresh water fittings	1
Assortment of PVC fittings	1
Spare hose of each size	1
hydraulic hose plugs	set
Spare toilet motor	1
Spare toilet solenoid	1
Spare toilet switch	1
Holding tank pump	1
Miscellaneous	
Spare propeller	1
Cutlass bearings	2
Bellows/misc parts for packing gland	1
Filter bowl gaskets for strainers	6
Main ER sea strainer O rings	4
Hydraulic system filter	2
hull zincs	8
prop zincs	12
stanchion spares	2